Source Water Delineation and Assessment Report

Public Water Supply: **Garryowen Historical Land Preservation (PWSID #MT0004216)**
Report Date: **April 25, 2006**
Review Date: **May 16, 2006**
Contact Person: **Chris Kortlander**
Garryowen Historical Land Preservation
P.O. Box 200
Garryowen, MT 59031

Introduction

This delineation and assessment report is intended to meet the technical requirements of the Montana Source Water Protection Program (DEQ, 1999) and the Federal Safe Drinking Water Act (SDWA) Amendments of 1996 (P.L. 104-182). Laura Rennick, an intern with the Source Water Protection Program (SWPP) at the Montana Department of Environmental Quality (DEQ) prepared this report and Jim Stimson, Hydrogeologist with the SWPP reviewed and edited the report. Information on land use and potential contaminant sources comes from a variety of sources including a preliminary land cover data layer produced by the United States Geological Survey (USGS), DEQ Public Water Supply files (including sanitary surveys), and other public sources of information. A web-based GIS application was also used to query and generate maps to support the writing of this report. This application is called the Source Water Protection Program Query System and is available at the following web address or URL: http://nris.state.mt.us/wis/swap/swapquery.asp. The application was developed by the DEQ Source Water Protection Program (SWPP) and provides access to data from the U.S. EPA, DEQ, Montana Bureau of Mines and Geology (MBMG) and other sources.

Purpose

The purpose of this delineation and assessment report is to assess threats to The Garryowen Historical Land Preservation public water supply using information obtained from personnel managing the site, the most recent sanitary survey, which was completed August 11, 2004, by Jim Melstad, of The Cadmus Group, Inc., and from published reports. Delineation is a process whereby areas that contribute water to aquifers or surface waters used for drinking water are identified on a map. These areas are referred to as source water protection areas. Assessment involves identifying locations or regions in source water protection areas where contaminants may be generated, stored, or transported and then determining the potential for contamination of drinking water by these sources.

Public Water Supply Information

The Garryowen Historical Land Preservation is located 19 miles south of Hardin on Interstate 90 at exit 514. The system consists of a service station, a Subway sandwich

shop, a museum, and one residence/office. Water for the system is supplied from a single ground water well located north east of the museum building (Figure 1 and 2). The water system supplies water to a resident population of 2 people year round, a non-transient population of 5 people year round and to a transient population of about 150 people daily in the summer and about 25 people daily in the winter, the maximum possible transient population is 450 persons. Because the water supply does not regularly serve the same 25 persons for at least six months a year, it is classified as a transient, non-community public water supply (Sanitary Survey, 2004).

The well is located on the north side of the property. No well log is available for Well #1 and as a result, no well completion information is available. The well is estimated to be about 80 feet deep and cased in 6-inch steel. The well's casing extends 18 inches above ground level. There is a 55-gallon drum barrel placed over the wellhead, and labeled "HIGH VOLTAGE" to discourage people from tampering with the well. Water flows from the well through four sediment filters to a 475-gallon storage tank in the basement of the Subway restaurant. After this first storage tank there is a booster pump. When this pump operates a 7% hydrogen peroxide solution is injected into the storage tank to remove iron and help eliminate hydrogen sulfide-related odors from the water. Pressurized water then flows through a water softener and into the distribution system of the museum and residence. Water for the service station and Subway sandwich shop is further treated by a reverse osmosis treatment system, which empties into a 100-gallon storage tank. There is a second booster pump that re-pressurizes water for use in the second distribution system. Cut-in pressure was measured at 45 psi, while cut-out pressure was measured at 75 psi. The distribution system consists mainly of polyethylene piping outside, and copper piping inside (Sanitary Survey, 2004).

Driller's logs for other wells in the vicinity of the Garryowen Historical Land Preservation indicate that most of the wells are between 30 and 40 feet deep and they are completed in gravel deposits associated with the Little Bighorn River alluvium. These shallow wells encounter 12 to 20 feet of clay above 10 to 15 feet of gravel. The gravel is the aquifer for these wells. Beneath the gravel most well logs indicate the presence of brown or dark blue shale. The well serving the Garryowen facility is estimated to be on the order of 80 feet deep. Based on the geology of the area, this well would penetrate the shallow gravel aquifer and very likely be completed in the Upper Cretaceous Judith River Formation. The Judith River consists of a sequence of silty sandstone lenses interbedded with lesser amounts of shale. The Judith River Formation is considered to be semi-confined. If the clay layer recorded in other wells is present at Garryowen, the aquifer could be interpreted to be fully confined if the well were constructed properly. Without the driller's log for the Garryowen's well, it is not possible to determine if the well is properly grouted or sealed. For the purpose of this assessment, the aquifer that Garryowen well is completed in is interpreted to be locally confined. However, the aquifer is assigned a high sensitivity rating to potential contaminant sources in the area because the well log is not available to verify well construction. If additional accurate well completion information becomes available in the future please forward a copy to DEQ.

Garryowen Historical Land Preservation is required to test for microbiological contaminants and nitrate. The well system must complete monthly bacteriological samples, as well as an annual nitrate sample. In the past five years (2001-2005), the water supply has had 5 positive total coliform detects in December 2001. Since January of 2004, samples have not detected bacteria (Appendix C). The highest nitrate reading recorded for Well #1 in the past five years was 0.72 mg/L in 2005. The lowest nitrate reading recorded for the well in the past five years was 0.56 mg/L in 2002 and 2003. There were no nitrate readings for 2001 or 2004. The average nitrate reading for the past five years is 0.61 mg/L. These levels are below the maximum concentration level (MCL) for nitrate is 10 mg/L set by the U.S. Environmental Protection Agency (EPA).

The sanitary survey for Garryowen Historical Land Preservation makes six main recommendations:

1. The well cap should be replaced with one that is suitable for outdoor use. The current well cap is made for wells located inside a well house.
2. Approved backflow prevention devices should be installed on all threaded hose bibs and on any frost-free hydrants connected to the system. This will prevent back siphoning in the event of a sudden loss of pressure.
3. The backwash lines from the softener and the reverse osmosis treatment system should be checked to ensure that they do not discharge directly into a drain line. An air gap of at least two pipe diameters is required.
4. A downward facing vent should replace the current vent on the well cap. This will minimize the chance of dust and water entering the well.
5. It is recommended that pressure relief valves be provide to protect the pressure tanks. It is also advised that gate valves or globe valves be installed so that tanks can be separated from the system.
6. At the time of the sanitary survey the hydrogen peroxide solution that was being used was not an NSF approved chemical. It is required by MDEQ that only NSF approved chemicals be used as disinfectants.

(Sanitary Survey, 2004)

According to the owner / operator, efforts are being made to address the list of recommendations (Chris Kortlander, May 16, 2006, Personal Communication).

Delineation

Two source water protection zones are delineated for Garryowen Historical Land Preservation. They include a 100-foot radius control zone and a one-mile radius inventory region cut along the Little Big Horn River and Shoulder Blade Creek (Figure 1 and 2). Ground water flow direction in this area is interpreted to be generally from the south-southwest to the north-northeast, towards the Little Big Horn River (Figure 1). Close to the river the ground water flow direction is interpreted to be generally parallel to the river. The control zone is the most critical area from which direct introduction of contaminants into the well or immediate area can occur. The inventory region encompasses the area from which water or contaminants can flow into the water supply over a period of months to years.

Inventory

The Montana Source Water Protection Program (Montana DEQ, 1999) requires that land uses and all potential sources of nitrate and microbial pathogens within the control zone and inventory region be identified.

Analysis of the area surrounding Garryowen Historical Land Preservation reveals that the predominant land covers are about 50% agriculture, 25% grazing land or wild hay, and about 25% wetlands. Some of the agricultural land in the inventory region is located in an up-gradient location from the well and may be a potential source of contamination to the well. The concern is the potential for mismanagement or over-application of fertilizers and/or pesticides on the agricultural-land in the inventory region.

The Historical Land Preservation facility is served by a large capacity septic system and drainfield located east of the Convenience Store building (Figure 1 and 2). Based on ground-water flow direction, this places the septic system up-gradient from the public water supply well. According to the most recent sanitary survey, the septic tank and drainfield are located more thant 100 feet from the well. According to the owner / operator, the septic system is approximately 180 feet from the wellhead (Chris Kortlander, May 16, 2006, Personal Communication). The area surrounding the Garryowen facility has low septic density. Septic density represent the extent of individual septic tanks in the area, which can be potential sources of contamination (Figure 1).

Interstate 90 and the railroad also represent potential contaminant sources. The railroad is located more than 600 feet west of the well and the interstate is about 250 feet west of the well.

Susceptibility Assessment

Susceptibility to potential contaminant sources is assessed for a public water supply well. No well log is available for this system that indicates that it was properly sealed and completed. Well log information helps verify that the well is constructed properly and helps identify the aquifer that the well is completed in. When constructed properly, shallow ground water that is more vulnerable to contaminant sources at the land surface is prevented from entering the well's bore hole and co-mingling with water from the deeper aquifer. Under some circumstances, the well bore would act as a conduit for contaminants entering the deeper aquifer. In this case, the aquifer is considered to be confined, at least locally, but it is assigned a high sensitivity to potential contaminant sources located in the area because no well log can be found (Montana DEQ, 2000, Table 2). The cross or down-gradient location of some of the potential contaminant sources is used as a barrier for the water supply system. This means ground water is flowing parallel or away from the well and not towards it.

Potential sources of nitrate and bacterial contamination in the area include the on-site septic system and drainfield, agricultural land, Interstate 90, the railroad, and possibly Class V injection wells.

The large capacity septic tank and drainfield are assigned a hazard rating of high. The drainfield is identified as being to the southeast, or up gradient to the well in the sanitary survey. The widespread clay layer identified in multiple driller's logs for nearby wells and the setback distance of 180 feet are used as barriers. Susceptibility is set at moderate to high (Montana DEQ, 2000, Table 9b).

The agricultural lands represent a moderate hazard. With some of the ag-land in a down gradient location counted as a barrier the susceptibility is set at moderate (Montana DEQ, 2000, Table 9b).

Interstate 90 is located about 250 west-southeast of the well and represents a high hazard if accidents or spills occur on it. With the clay layer and setback distance counting as barriers, susceptibility is set at moderate to high (Montana DEQ, 2000, Table 10).

The railroad is located more than 600 feet west-southwest of the well and represents a high hazard if accidents or spills occur on it. Hazards for railroads are often set at high because of the potential for carrying large amounts of hazardous materials. With the above mentioned barriers counted, the susceptibility is set at moderate to high (Montana DEQ, 2000, Table 10).

It may be possible to lower some of these ratings if more accurate information on the well construction and the well log were located.

Class V Injection Wells could represent a possible hazard although the rating and susceptibility is unknown as no inventory data is available from local, state, or federal sources.

Management Options

Possible management options for potential contamination from individual and large capacity septic systems includes routine maintenance and providing guidance and educational material to patrons on the proper disposal of household hazardous wastes. Being aware of accidents on the road, especially those of tanker trucks, is a way to manage potential contamination from those sources. To manage potential contamination by Class V injection wells, options include encouraging efforts to inventory such wells and provide educational information to business owners and the public on proper waste disposal and recycling. The hazard and susceptibility ratings for each potential contaminant source as well as management options are summarized in Table 1.

References:

DEQ Permitting and Compliance Division, 2004. Sanitary Survey for Garryowen Historical Land Preservation PWS- PWS ID: #MT0004216.

Montana DEQ, 1999. Montana Source Water Protection Program, Approved by EPA in November 1999.

Montana DEQ, 2000. Montana Source Water Protection Program, Template for Non-Community Transient Public Water Supplies, Revised 2002.

Montana State Library - Natural Resources Information System (NRIS) 2000 map base of the USGS Topographical coverage at 1:24,000 scale in MrSID format.

U.S. EPA, Office of Water, 1991. Manual of Small Public Water Supply Systems, EPA 570/9-91-003, 211 p.

U.S. Geological Survey, 2000. National Landcover Dataset, Montana. 30-meter electronic digital landcover/land use dataset interpreted from satellite imagery.

Table 1. Susceptibility Assessment of Significant Potential Contaminant Sources

Potential Contaminant Source	Potential Contaminants	Hazard	Hazard Rating	Barriers	Susceptibility	Management Recommendation
On Site Septic System and Drainfield	Nitrates, Pathogens	Ongoing or catastrophic leakage of sewage into ground water	**High**	-Clay Layer -Setback distance of 180 feet	**Moderate to High**	Properly operate and maintain the on-site septic system and distribution lines. A two to three year septic tank pumping maintenance schedule is recommended. Consider connecting to municipal sewer system, if available. Encourage and support city and county efforts to provide educational materials and workshops to the public on proper handling and disposal of industrial and household hazardous wastes and recycling.
Transportation Routes **Interstate 90** **Railroad**	Pesticides, fertilizers, VOCs, SOCs, other	Spills, routine spraying, storm water runoff, infiltration into ground water	**High** **High**	-Clay Layer -Setback distance of 250 feet -Clay Layer -Setback distance of more than 600 feet	**Moderate to High** **Moderate to High**	Notify landowners of well and protection area locations. Encourage and support emergency planning, training of local emergency response personnel, use of levees and engineered storm drainage to carry any spills away and prevent infiltration into ground, cooperation with railroad managers or MDOT to reduce herbicide use.
Cropped Agricultural Land Use	SOCs, Nitrates, Pathogens	Contaminants leaching into ground water	**Moderate**	Some of this area is located in a down gradient location	**Moderate**	Notify landowners of well and protection area locations. *E*ncourage and support efforts to provide educational information, materials, and resources to land owners on the proper application and storage of pesticides and fertilizers and implementing agricultural best management practices (BMPs).
Class V Injection Wells	VOCs, SOCs, pathogens, nitrate	Infiltration of contaminants into aquifer	**Unknown**	None	**Unknown**	Encourage EPA to inventory the area Support providing educational information, materials and resources to business owners and the public on proper waste disposal and recycling

Figure 1 and 2

Appendix A – Sanitary Survey

Appendix C – DEQ Water Quality Report

Montana Department of Environmental Quality
Data Source: Public Water Supply Section

Public Water Supply System

Return to PWS Query
Return to PWS Reports

PWSID: MT0004216 **Name:** GARRYOWEN HISTORICAL LAND PRESERVATION

City: GARRYOWEN **County:** BIG HORN **Tot Pop:** 157

Pri Src: GW **Class:** NC **Last Snty Srv Dt:** 08/11/2004 **Activity Status:** A

Type	Conn's	In Srvc Dts	Eff Begin Dt	Avg Daily Cnt	Type
CM	3	1/1-12/31	08/11/2004	2	R
		1/1-12/31	08/11/2004	5	NT
		1/1-12/31	08/11/2004	150	T

Administrative Contact	Financial Contact	Owner
KORTLANDER, CHRIS	KORTLANDER, CHRIS	KORTLANDER, CHRIS

Facilities and Entry Points

Status: A 08/13/2001 **Fac ID** DS001 DISTRIBUTION SYSTEM **Src:** GW
Lat/Long Dec: **DMS:**

Smp Pt ID	Status	Description
SP001	A 08/13/2001	SP FOR DS

Status: A 08/13/2001 **Fac ID** PC001 PRESSURE CONTROL ASSEMBLY **Src:** GW
Lat/Long Dec: **DMS:**

Status: A 08/13/2001 **Fac ID** ST001 STORAGE FACILITY 1 **Src:** GW
Lat/Long Dec: **DMS:**

Status: A 08/11/2004 **Fac ID** ST002 STORAGE FACILITY 2 **Src:** GW
Lat/Long Dec: **DMS:**

Status: A 08/13/2001 **Fac ID** TP001 TREATMENT PLANT **Src:** GW
Lat/Long Dec: **DMS:**
TP Units: F580 I640 P341 S460 T580

Smp Pt ID	Status	Description
EP502	A 08/13/2001	EP FOR WELL 1 TP

Status: A 08/13/2001 **Fac ID** WL002 WELL1 **Src:** GW
Lat/Long Dec: **DMS:**

Sample Schedules/Monitoring Requirements

Attention Community and Noncommunity Nontransient systems: the new Disinfection Byproducts Rule has taken effect. Please contact the PWS Section at 444-4400 for additional monitoring requirements.

Fac ID: DS001 **Fac Name:** DISTRIBUTION SYSTEM **Status:** A **Src:** GW

Smp Pt I	Active	Smp Pt Descriptio
SP001	A	SP FOR DS

Group	Name	Schd Beg Dat	Seas Coll Pe	Requiremen
3100	COLIFORM, TOTAL (TCR)	03/01/2004	1/1-12/31	1 RT MN

April 25, 2006 4:33 PM

Page 1 of 5

PWSID: MT0004216 **Name:** GARRYOWEN HISTORICAL LAND PRESERVATION (continued)

Fac ID: TP001 **Fac Name:** TREATMENT PLANT **Status** A **Src** GW

Smp Pt I	Active	Smp Pt Descriptio
EP502	A	EP FOR WELL 1 TP

Group	Name	Schd Beg Dat	Init MP Be	Seas Coll Pe	Requiremen
NITR	CDS NITRATE NITRITE	01/01/2001	01/01/2001	1/1-12/31	1 RT YR

Bacti Results

FROM 01/01/2000 TO 04/25/2006

Collection D	Lab Numbe	Type	Orig Lab	Code		TCR Presenc		Fec/EC Result
04/10/2006	B06040760-001	ART		3014	COLIFORM, E. COLI	A		-
04/10/2006	B06040760-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
03/14/2006	B06030907-001	ART		3014	COLIFORM, E. COLI	A		-
03/14/2006	B06030907-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
02/21/2006	B06021290-001	ART		3014	COLIFORM, E. COLI	A		-
02/21/2006	B06021290-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
01/17/2006	B06010998-001	ART		3014	COLIFORM, E. COLI	A		-
01/17/2006	B06010998-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
12/12/2005	B05120656-001	ART		3014	COLIFORM, E. COLI	A		-
12/12/2005	B05120656-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
11/16/2005	B05111143-001	ART		3014	COLIFORM, E. COLI	A		-
11/16/2005	B05111143-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
09/12/2005	B05090747-001	ART		3014	COLIFORM, E. COLI	A		-
09/12/2005	B05090747-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
08/10/2005	B05080873-001	ART		3014	COLIFORM, E. COLI	A		-
08/10/2005	B05080873-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
07/12/2005	B05070837-001	ART		3014	COLIFORM, E. COLI	A		-
07/12/2005	B05070837-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
06/08/2005	B05060679-001	ART		3014	COLIFORM, E. COLI	A		-
06/08/2005	B05060679-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
05/25/2005	B05051711-001	ART		3014	COLIFORM, E. COLI	A		-
05/25/2005	B05051711-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
05/01/2005	B05050168-001	ART		3014	COLIFORM, E. COLI	A		-
05/01/2005	B05050168-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
03/14/2005	B05030834-001	ART		3014	COLIFORM, E. COLI	A		-
03/14/2005	B05030834-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
02/16/2005	B05020924-001	ART		3014	COLIFORM, E. COLI	A		-
02/16/2005	B05020924-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
01/18/2005	B05010731-001	ART		3014	COLIFORM, E. COLI	A		-
01/18/2005	B05010731-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
12/13/2004	B04120803-001	ART		3014	COLIFORM, E. COLI	A		-
12/13/2004	B04120803-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	

PWSID: MT0004216 Name: GARRYOWEN HISTORICAL LAND PRESERVATION (continued)

Collection D	Lab Numbe	Type	Orig Lab	Code		TCR Presenc		Fec/EC Result
11/15/2004	B04110830-001	ART		3014	COLIFORM, E. COLI	A		-
11/15/2004	B04110830-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
10/18/2004	B04101034-001	ART		3014	COLIFORM, E. COLI	A		-
10/18/2004	B04101034-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
09/14/2004	B04090902-001	ART		3014	COLIFORM, E. COLI	A		-
09/14/2004	B04090902-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
08/17/2004	B04081116-001	ART		3014	COLIFORM, E. COLI	A		-
08/17/2004	B04081116-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
07/13/2004	B04070777-001	ART		3014	COLIFORM, E. COLI	A		-
07/13/2004	B04070777-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
06/08/2004	B04060679-001	ART		3014	COLIFORM, E. COLI	A		-
06/08/2004	B04060679-001	ART		3100	COLIFORM, TOTAL (TCR)	A	-	
05/17/2004	B04051039-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
04/19/2004	B04041238-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
03/17/2004	B04030940-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
02/19/2004	B04020897-1	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
01/21/2004	B04010814-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
01/13/2004	B04010527-001	ART		3014	COLIFORM, E. COLI	P		+
01/13/2004	B04010527-001	ART		3100	COLIFORM, TOTAL (TCR)	P	+	
12/15/2003	B03120832-1	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
11/24/2003	B03111146-1	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
10/20/2003	B03101045-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
09/16/2003	B03090833-1	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
08/19/2003	B03080974	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
07/15/2003	B03070877-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
06/18/2003	B03061125-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
05/14/2003	B03050874-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
04/22/2003	B03041278-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
03/18/2003	B03030771-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
02/19/2003	B03020793-1	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
01/14/2003	B03010673-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
12/12/2002	B02120618-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
11/18/2002	B02110888-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
10/22/2002	B02101131-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
09/16/2002	B02090858-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
08/19/2002	B02081004-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
07/15/2002	B02070811-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
06/18/2002	B02061094-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
05/21/2002	B02051152-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
04/30/2002	B02050062-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	

PWSID: MT0004216 **Name:** GARRYOWEN HISTORICAL LAND PRESERVATION (continued)

Collection D	Lab Numbe	Type	Orig Lab	Code		TCR Presenc		Fec/EC Result
03/13/2002	B02030498-1	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
02/13/2002	B02020544-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
01/18/2002	B02010278-001	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
01/18/2002	B02010278-002	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
01/18/2002	B02010278-003	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
01/18/2002	B02010278-004	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
01/18/2002	B02010278-005	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
12/26/2001	001-01-61410	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
12/26/2001	002-01-61410	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
12/26/2001	003-01-61410	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
12/26/2001	004-01-61410	RT		3100	COLIFORM, TOTAL (TCR)	A	-	
12/12/2001	001-01-61000	RP	001-01-6073	3014	COLIFORM, E. COLI	A		-
12/12/2001	001-01-61000	RP	001-01-6073	3100	COLIFORM, TOTAL (TCR)	P	+	
12/12/2001	002-01-61000	RP	001-01-6073	3014	COLIFORM, E. COLI	A		-
12/12/2001	002-01-61000	RP	001-01-6073	3100	COLIFORM, TOTAL (TCR)	P	+	
12/12/2001	003-01-61000	RP	001-01-6073	3014	COLIFORM, E. COLI	A		-
12/12/2001	003-01-61000	RP	001-01-6073	3100	COLIFORM, TOTAL (TCR)	P	+	
12/12/2001	004-01-61000	RP	001-01-6073	3014	COLIFORM, E. COLI	A		-
12/12/2001	004-01-61000	RP	001-01-6073	3100	COLIFORM, TOTAL (TCR)	P	+	
12/05/2001	001-01-60731	RT		3014	COLIFORM, E. COLI	A		-
12/05/2001	001-01-60731	RT		3100	COLIFORM, TOTAL (TCR)	P	+	

Chemical Results

FROM 01/01/2000 TO 04/25/2006

Fac ID: TP001 **Fac Name:** TREATMENT PLANT **Avl:** P **Status:** A **Src:** GW
Smp Pt ID: EP502 **Status:** A **Description:** EP FOR WELL 1 TP **Src Typ** FN

Analyte/CAS No	Code	Analyte Name	Type	Collection D	Lab	Sample Numbe	Result	
IOC	1038	NITRATE+NITRITE (AS N)	RT	03/30/2005	08	B05031825-001A	0.72	MG/L
IOC	1038	NITRATE+NITRITE (AS N)	RT	07/16/2003	08	B03070957-001-N502	0.56	MG/L
IOC	1038	NITRATE+NITRITE (AS N)	RT	12/12/2002	08	B02120621-001-N502	0.56	MG/L

Violations & Enforcements

FROM 01/01/2000 TO 04/25/2006

Viol Date	Comp Beg	Comp End	Fed F	Viol No	Type	Sev	Cate	Code	Name
12/22/2005	10/01/2005	10/31/2005	2006	3	23	MJ	MON	3100	COLIFORM, TOTAL (TCR)
2005	54851	02/28/2006	SOX		ST COMPLIANCE ACHIEVED				
2006	54854	12/25/2005	SIE		ST PUBLIC NOTIF REQUESTED				
2006	54853	12/25/2005	SIA		ST VIOLATION/REMINDER NOTICE				
05/24/2005	04/01/2005	04/30/2005	2005	3	23	MJ	MON	3100	COLIFORM, TOTAL (TCR)
2005	54851	02/28/2006	SOX		ST COMPLIANCE ACHIEVED				
2005	54850	05/27/2005	SIE		ST PUBLIC NOTIF REQUESTED				
2005	54849	05/27/2005	SIA		ST VIOLATION/REMINDER NOTICE				

PWSID: MT0004216 Name: GARRYOWEN HISTORICAL LAND PRESERVATION (continued)

Viol Date	Comp Beg	Comp End	Fed F	Viol No	Type	Sev	Cate	Code	Name
04/06/2005	01/01/2004	12/31/2004	2005	3	03	MJ	MON	NITR	CDS NITRATE NITRITE
2005	54852	07/05/2005	SOX		ST COMPLIANCE ACHIEVED				
2005	54847	04/13/2005	SIE		ST PUBLIC NOTIF REQUESTED				
2005	54846	04/13/2005	SIA		ST VIOLATION/REMINDER NOTICE				
12/17/2001	12/01/2001	12/31/2001	2002	2	22		MCL	3100	COLIFORM, TOTAL (TCR)
2002	52055	03/12/2002	SOX		ST COMPLIANCE ACHIEVED				
2002	50901	12/18/2001	SIE		ST PUBLIC NOTIF REQUESTED				
2002	50900	12/18/2001	SIA		ST VIOLATION/REMINDER NOTICE				
2002	50903	12/18/2001	MPH		PHONE CALL TO SYSTEM				
2002	50902	12/18/2001	MHA		HEALTH ADVISORY				
2002	50903	12/18/2001	EF<		FED CFP ISSUED				
12/13/2001	11/01/2001	11/30/2001	2002	3	23	MJ	MON	3100	COLIFORM, TOTAL (TCR)
2002	54841	06/07/2002	SOX		ST COMPLIANCE ACHIEVED				
2002	50905	12/16/2001	SIE		ST PUBLIC NOTIF REQUESTED				
2002	50904	12/16/2001	SIA		ST VIOLATION/REMINDER NOTICE				
12/06/2001	10/01/2001	10/31/2001	2002	3	23	MJ	MON	3100	COLIFORM, TOTAL (TCR)
2002	54841	06/07/2002	SOX		ST COMPLIANCE ACHIEVED				
2002	50712	12/09/2001	SIE		ST PUBLIC NOTIF REQUESTED				
2002	50711	12/09/2001	SIA		ST VIOLATION/REMINDER NOTICE				
11/23/2001	09/01/2001	09/30/2001	2002	3	23	MJ	MON	3100	COLIFORM, TOTAL (TCR)
2002	54841	06/07/2002	SOX		ST COMPLIANCE ACHIEVED				
2002	50217	11/26/2001	SIE		ST PUBLIC NOTIF REQUESTED				
2002	50216	11/26/2001	SIA		ST VIOLATION/REMINDER NOTICE				