OPERATING PERMIT APPLICATION

MONTANA LIMESTONE RESOURCES

APPENDIX A-2

BASELINE HYDROLOGY REPORT

Revised June 2018

BASELINE HYDROLOGY REPORT FOR THE MONTANA LIMESTONE RESOURCES PROJECT GRANITE COUNTY, MONTANA

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BASELINE HYDROLOGY REPORT FOR THE MONTANA LIMESTONE RESOURCES PROJECT GRANITE COUNTY, MONTANA

1.0 INTRODUCTION

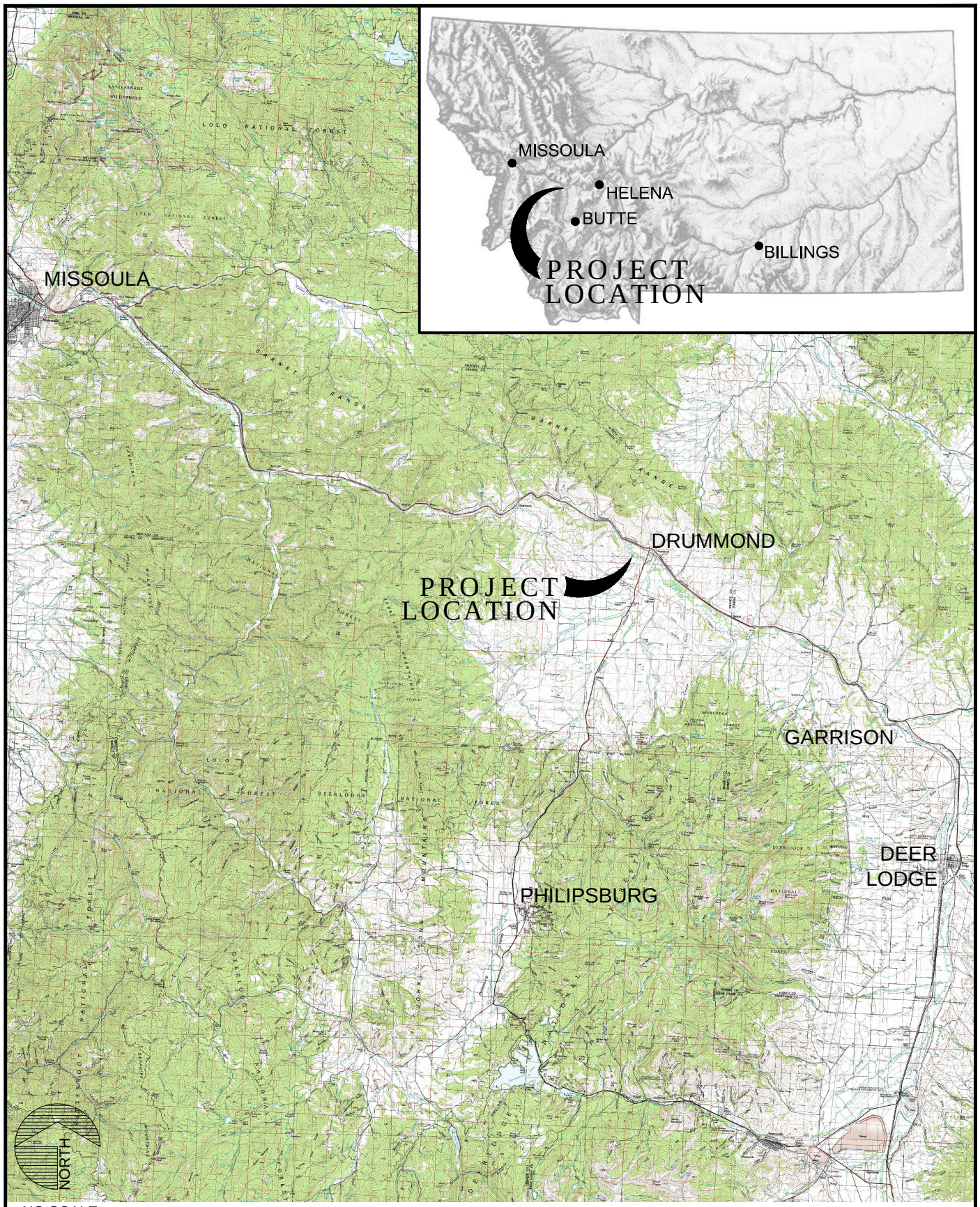
The Montana Limestone Resources (MLR) Project is located approximately two miles west of the town of Drummond in Granite County, Montana (Figure 1-1). The MLR Project includes a proposed limestone mine (quarry), lime processing plant and related infrastructure. The ore body consists of high calcium carbonate limestone within the Mission Canyon unit of the Madison Limestone Group. The Project area lies immediately south of the Clark Fork River drainage bottom and west of the Flint Creek drainage.

This report describes hydrologic features and conditions in and around the MLR Project area. The following information has been compiled from various technical reports and other sources, as well as an extensive monitoring program developed and implemented by MLR. This information has been utilized in the planning and design of the MLR Project, and also establishes baseline hydrologic conditions in the area for comparison to operational phase hydrologic conditions.

1.1 HYDROLOGIC SETTING

The MLR Project lies within the Clark Fork River drainage, a major tributary to the Columbia River (hydrologic unit code 17010202). Primary surface water features in the general vicinity of the MLR Project include the Clark Fork River (CFR), a slough or side channel associated with the CFR, Tigh Creek, Lorranson Creek southeast of the Project site, and Flint Creek (Figure 1-2). The Clark Fork River drainage bottom lies immediately northeast of the Project site with the main river channel approximately 0.5 miles northeast of the proposed limestone quarry. Continuous streamflow data from USGS gaging station 12331800, located approximately 13 miles downstream of the Project area, shows a maximum and minimum daily average flow rate of 7740 cfs on June 10, 2011 and 138 cfs on January 22, 2008, respectively, for the October 2007 through December 2017 period of record (Figure 1-3).

A small slough or side channel of the Clark Fork River flows from southeast to northwest along the western edge of the floodplain between the river and proposed mine site. The side channel receives seasonal flow from the Clark Fork River via an irrigation ditch, from irrigation return flows, and possibly from shallow groundwater recharge.



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MONTANA LIMESTONE RESOURCES PROJECT	**PROJECT LOCATION MAP**	FIGURE **1-1**

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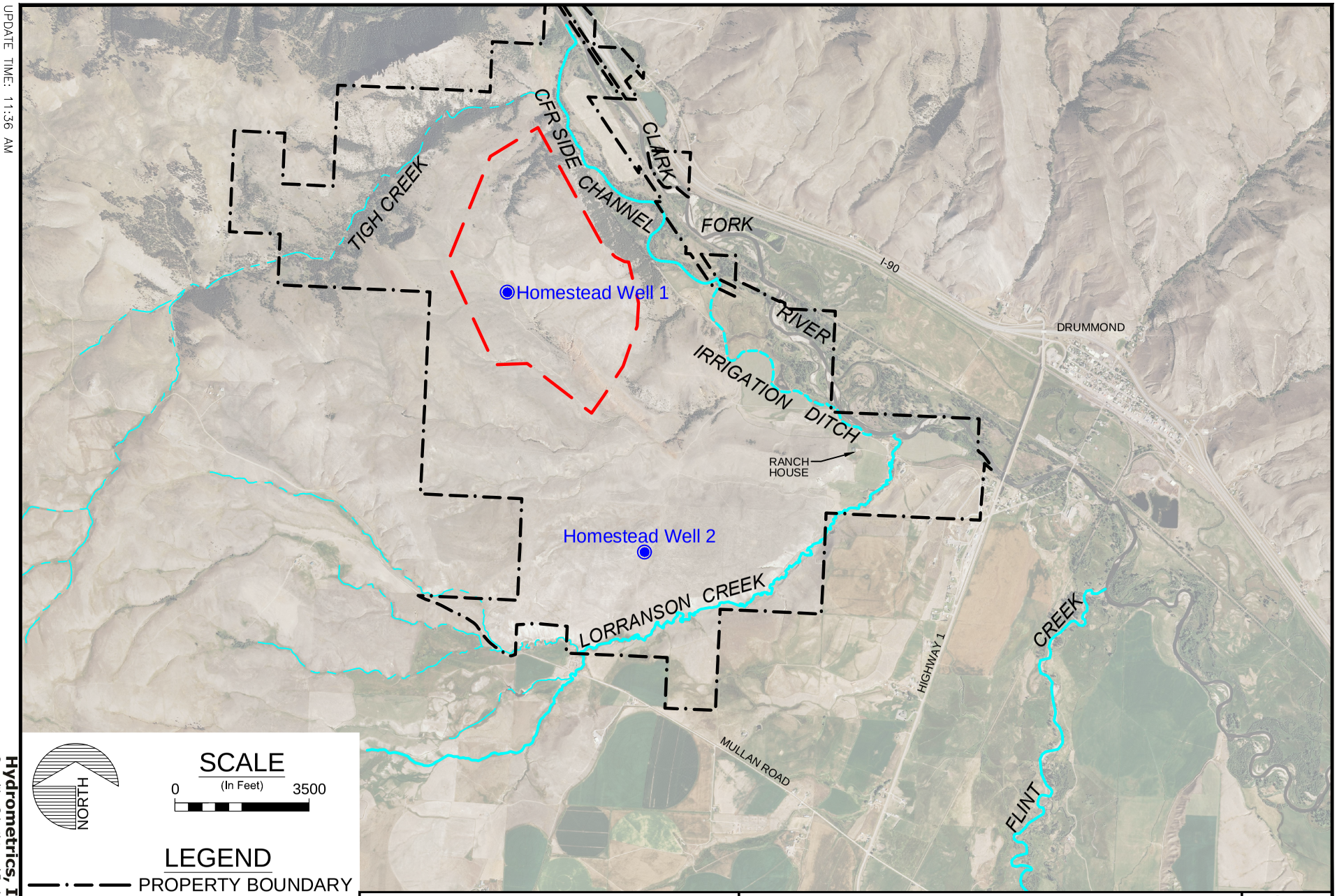

MONTANA LIMESTONE RESOURCES PROJECT

REGIONAL WATER RESOURCE FEATURES

FIGURE **1-2**

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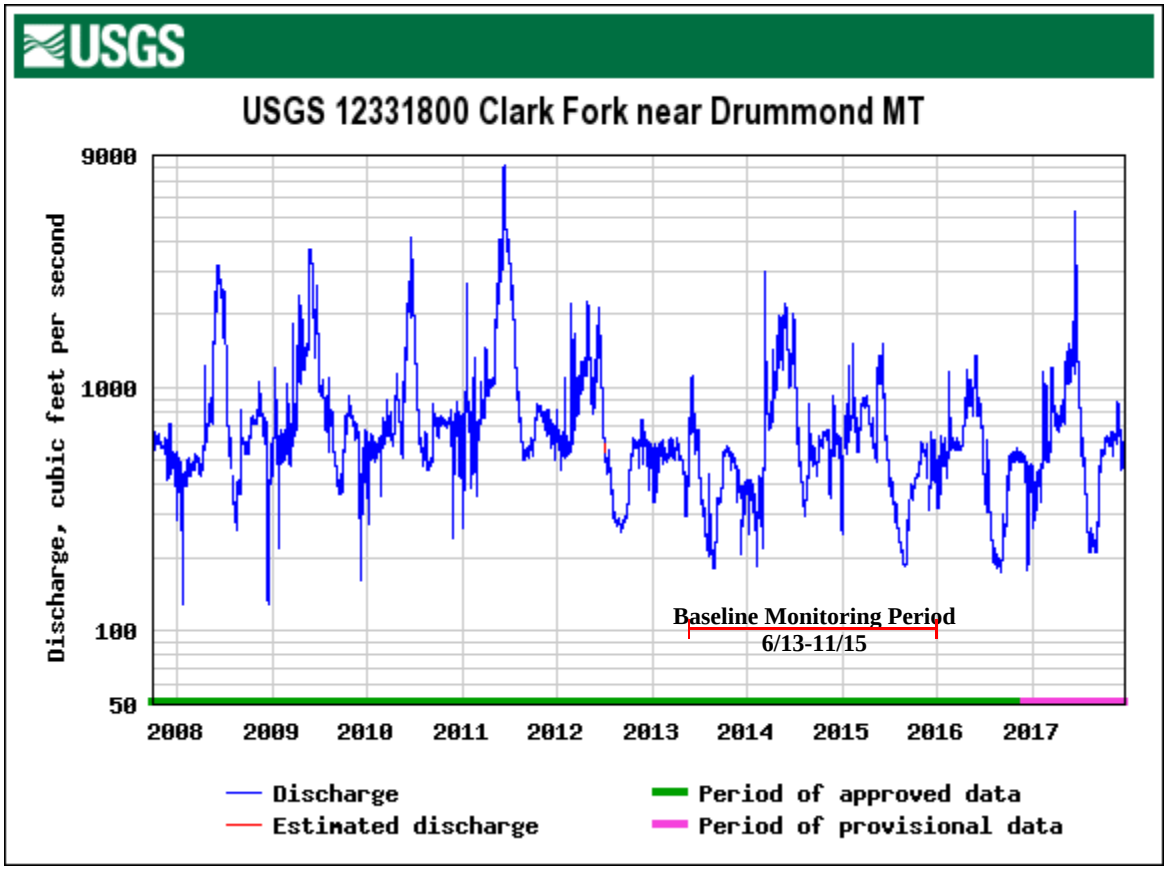


FIGURE 1-3. CLARK FORK RIVER HYDROGRAPH NEAR DRUMMOND

Tigh Creek drainage lies approximately 0.5 miles northwest of the proposed mine facilities and is a tributary to the Clark Fork River. Despite the considerable size of the drainage, Tigh Creek is typically dry. Since initiation of baseline monitoring activities in 2013, flow has not been observed in Tigh Creek and no indications of recent flow, such as newly scoured sections of the creek bottom or recent accumulations of debris, have been observed. Based on conversations with local ranchers, Tigh Creek typically flows only in response to very high intensity precipitation or snowmelt events. The cobble/boulder creek bed material indicates the drainage does experience periodic high intensity, short-duration flows. The abundant Madison Limestone outcrops in the drainage suggest that any ephemeral surface flow that may occur quickly infiltrates into the limestone. The lack of perennial surface flow indicates that the local and regional groundwater table lies some distance below the creek bed, even in the lower reaches of Tigh Creek (approximate elevation 3920 feet).

A small creek is located south/southeast of the proposed mine facilities (Figure 1-2). Although unnamed on the USGS topographic map, the creek is referred to as Lorranson Creek (MBMG, 1997) and as Allendale Ditch elsewhere and is referred to as Lorranson Creek in this report. The majority of creek flow is derived as tail water from Allendale Ditch, which is fed by Flint Creek approximately 10 miles south of the Project area, and other irrigation return flows. Lorranson Creek is also fed by a number of springs located two to three miles south of the Project area and south of Mullan Road

(Figure 1-2). The creek would likely be dry most of the year if not for the irrigation return flows (MBMG, 1997).

Flint Creek is located east of Highway 1, about 3.5 miles east of the proposed limestone quarry and plant site. Flint Creek is a major tributary of the Clark Fork River extending approximately 36 miles from Georgetown Lake to its mouth. As noted above, flow in Lorranson Creek is derived in part from Flint Creek through the Allendale Ditch. Otherwise, Flint Creek is not considered to be a significant hydrologic feature in terms of mine planning due to its distance from the limestone quarry and plant site.

Pre-existing information on local groundwater resources is limited due to a general lack of development in the immediate Project area. Two old wells associated with former homesteads are located within the general Project area including Homestead Well 1 and Homestead Well 2 (Figure 1-2). Homestead Well 1 is a 6-inch diameter steel-cased well located near the proposed plant site. The well is 47 feet deep with the depth to water about 29 feet below ground surface (bgs). Homestead Well 2 is a four-foot-diameter dug well located south of the Project area. This well is 55 feet deep with a water level of about 52 feet bgs. Based on information collected through MLR's baseline characterization program, both of the homestead wells are believed to be completed in shallow perched groundwater systems within Tertiary sediments, although well logs are not available for either well.

Two domestic water supply wells are located at the ranch house about one mile east of the proposed mine area (Figure 1-2). One of the wells is 65 feet deep and completed in "blue-green shale." According to the well log, the static water level was 20 feet bgs and well yield was 20 gpm in May 2010 when the well was completed. According to the home owner, the second well is 200 feet deep although no log or water level data are available for that well. Water levels and yields in both wells have reportedly declined in recent years to the point where the wells do not consistently meet summertime potable and lawn irrigation demands.

Based on the limited hydrologic information outlined above, it is apparent that water resources in the Project area are limited in quantity despite the proximity to the Clark Fork River. The lack of flow in Tigh Creek indicates that local and regional groundwater levels occur below the elevation of Tigh Creek. The two closest surface water features, the CFR side channel and Lorranson Creek both flow primarily in response to irrigation return flows. Limited yields in the two ranch house wells at depths of up to 200 feet also suggest a general lack of water resources in the immediate mine area.

In addition to the previously existing information summarized above, MLR has been collecting hydrologic data since spring 2013 as outlined in the project water resources monitoring plan (Hydrometrics, 2014). The baseline monitoring program scope and results are described below.

2.0 SURFACE WATER

Primary features of interest for the project include the Clark Fork River, the CFR side channel, Tigh Creek and Lorranson Creek (Figure 1-2). Baseline surface water monitoring was initiated on these water bodies in June 2013 in accordance with the baseline monitoring plan (Hydrometrics, 2014), as discussed below.

2.1 SURFACE WATER MONITORING PROGRAM

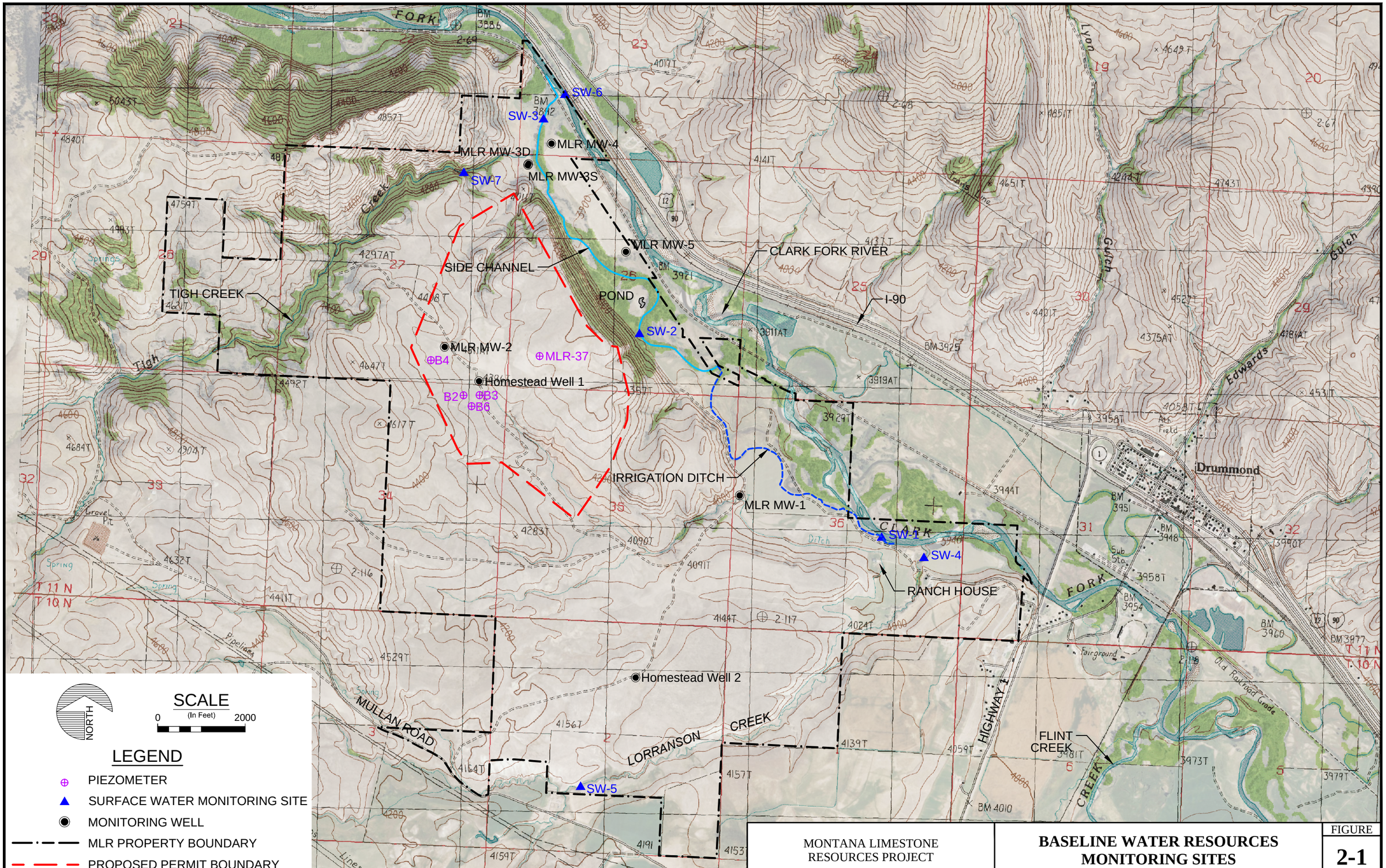
The baseline surface water monitoring program includes seasonal monitoring at eight stations, including two sites on the Clark Fork River side channel immediately northeast of the proposed mine facilities, one site on the irrigation ditch feeding the side channel, one site on the Clark Fork River downstream of the Project site, two sites on Lorranson Creek, one at the mouth of Tigh Creek, and one at a manmade pond on the Clark Fork River floodplain. Surface water monitoring locations are described in Table 2-1 and shown on Figure 2-1. The baseline monitoring schedule is shown in Table 2-2. A photo log of the surface water monitoring sites is included in Appendix A.

Monitoring site SW-1 is located on the main irrigation ditch supplying the majority of flow to the Clark Fork River side channel. SW-1 is located at the headgate on the Clark Fork River, and as such, monitoring at SW-1 provides data on upgradient surface water conditions in both the side channel and the Clark Fork River. Monitoring sites SW-2 and SW-3 are located at the middle and downstream end of the CFR side channel, respectively (Figure 2-1). SW-3 is located downstream of all currently proposed mine facilities. Site SW-2 is located intermediate to the upstream and downstream monitoring sites to further define baseline conditions within the side channel. Together, monitoring stations SW-1, SW-2 and SW-3 allow establishment of baseline surface water conditions along the Clark Fork River drainage bottom adjacent to the proposed mine facilities.

Surface water sites SW-4 and SW-5 are located on Lorranson Creek south/southeast of the Project area. SW-4 is located near the downstream end of the drainage immediately downstream of the current access road. SW-5 is located upstream of the proposed mine facilities and downstream of Mullan Road. The two sites span the area of the proposed Project access/haul road and power line.

Site SW-6 is located on the Clark Fork River downstream of the proposed mine facilities. Although monitoring sites SW-1, SW-2 and SW-3 (along the CFR side channel) provide baseline surface water data upgradient and downgradient of the Project area, SW-6 is included to provide downgradient surface water data in the event that the side channel goes dry seasonally.

Site SW-7 is located at the mouth of the deeply incised drainage of Tigh Creek. Although SW-7 was included in all sampling events, Tigh Creek was dry throughout the 2013 through 2015 monitoring period. The “POND” site is a manmade groundwater pond (no surface inflow or outflow) on the Clark Fork River floodplain northeast of the proposed mine facilities. The POND site provides data on the shallow alluvial groundwater system adjacent to the proposed facilities.



MONTANA LIMESTONE RESOURCES PROJECT

BASELINE WATER RESOURCES MONITORING SITES

FIGURE **2-1**

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TABLE 2-1. BASELINE WATER RESOURCES MONITORING SITES – MONTANA LIMESTONE RESOURCES PROJECT

Site	Coordinates (approx.)		Description
	Latitude	Longitude	
SW-1	46.6641	-113.1713	Head of irrigation ditch feeding side channel. Represents Clark Fork River water quality.
SW-2	46.6763	-113.1947	Clark Fork River side channel intermediate to SW-1 and SW-3.
SW-3	46.6898	-113.2045	Clark Fork River side channel near downstream end.
SW-4	46.6625	-113.1686	Lorranson Creek near downstream end.
SW-5	46.6474	-113.2083	Lorranson Creek upstream section; below Mullan Road crossing.
SW-6	46.6914	-113.2034	Clark Fork River downstream of Project.
SW-7	46.6863	-113.2110	Mouth of Tigh Creek
Pond	46.6785	-113.1951	Excavated pond on CFR Floodplain

Monitoring locations are shown on Figure 2-1.
Coordinates in NAD 83 Datum

TABLE 2-2. BASELINE WATER RESOURCES MONITORING SCHEDULE

	June 2013	August 2013	June 2014	August 2014	October 2014	April 2015	July 2015	October 2015	November 2015
Surface Water									
SW-1	**X**	**X**	**X**[1]	**X**	**X**[1]	---	**X**	---	**X**
SW-2	**X**	Dry	**X**[1]	**X**	**X**[1]	---	**X**	---	**X**
SW-3	**X**	Dry	**X**[1]	**X**	**X**[1]	---	**X**	---	**X**
SW-4	**X**	**X**	**X**[1]	**X**	**X**[1]	---	**X**	---	**X**
SW-5	**X**	**X**	**X**[1]	**X**	**X**[1]	---	**X**	---	**X**
SW-6	**X**	**X**	**X**	**X**	**X**	---	**X**	---	**X**
SW-7	**Dry**	**Dry**	**Dry**	**Dry**	**Dry**	---	**Dry**	---	**Dry**
Pond Site	**X**	**X**	**X**	**X**	**X**	---	**X**	---	**X**
Groundwater									
MW-1	---	---	**X**	**X**	**X**	**X**	**X**	**X**	---
MW-2	---	---	**X**	**X**	**X**	**X**	**X**	**X**	---
MW-3	---	---	**X**	**X**	**X**	**X**	**X**	**X**	---
MW-4	---	---	**X**	**X**	**X**	**X**	**X**	**X**	---
MW-5	---	---	**X**	**X**	**X**	**X**	**X**	**X**	---

(1) Bed sediment sampling conducted in June and October 2014 as part of surface water monitoring activities.

In addition to surface water sampling, stream bed sediment samples were collected in June and October 2014 at the surface water monitoring locations (Table 2-2). The streambed sediment sampling is intended to document baseline sediment metals concentrations in light of historic mining activities upstream of the MLR site. Sediment samples were collected concurrently with the June and October surface water monitoring events.

2.2 SURFACE WATER MONITORING RESULTS

Surface water monitoring results include streamflow measurements, field parameter measurements and laboratory analytical results. Each of these components is discussed below.

2.2.1 Surface Water Flows

Streamflow was measured at all surface water sites during the baseline surface water monitoring events in accordance with the Project SAP (Hydrometrics, 2014). Streamflow was measured with a Marsh McBirney velocity meter or, in the case of limited flows, a portable trapezoidal flume. Exceptions include site SW-6 where streamflow was not measured due to unwadeable conditions, and SW-7 and the POND site where there was no flow. The streamflow measurements are included in Table 2-3.

The data in Table 2-3 is arranged by drainage and in upstream to downstream order. The highest flows in the CFR side channel were consistently recorded at upstream site SW-1 at the Clark Fork River diversion headgate. The large decrease in flow recorded between SW-1 and midpoint site SW-2 (mean flow of 7.52 and 2.22 cfs, respectively), is attributable primarily to diversion of water from the channel for flood irrigation. Due to the dispersed nature of these diversions, an accurate accounting of groundwater recharge to or surface water leakage from the side channel could not be made through this reach. However, based on comparison of the side channel and nearby groundwater elevations, such as the POND site, the side channel most likely is a losing stream through this reach. Streamflow rates also decrease in the downstream reach of the side channel between sites SW-2 and SW-3. Based on the lack of irrigation diversions in this reach, the decrease in flow (1.68 cfs or 750 gpm based on mean flows, Table 2-3), is attributable to leakage to the shallow alluvial groundwater system.

Contrary to the side channel, flows in Lorranson Creek consistently increased from upstream (SW-5) to downstream (SW-4). This increase in flow is believed due primarily, if not entirely, to irrigation return flows in this reach. During all the sampling events, large volumes of irrigation return flow to the creek were observed from flood irrigated fields east of the creek. Based on the fine grained nature of the Tertiary age soils and sediments along Lorranson Creek, subsurface leakage into or out of the creek is expected to be minimal.

As noted in Section 1.1, Tigh Creek (site SW-7) was dry during all monitoring events, and during all other site visits by the Project team. According to the former ranch owner, Tigh Creek flows in response to high intensity precipitation and rapid snowmelt events only.

TABLE 2-3. SURFACE WATER STREAMFLOW MEASUREMENTS

Monitoring Site	6/14/13	8/22/13	6/26/14	8/29/14	10/30/14	7/23/15	11/20/15	Mean
Clark Fork River Side Channel								
MLR-SW-1	8.81	3.81	15.95	9.51	2.55	4.69	7.36	7.52
MLR-SW-2	1.22	Dry	4.25	1.68	0.55	1.35	4.27	2.22
MLR-SW-3	0.51	Dry	1.13	0.15	0.07	0.38	0.98	0.54
Lorranson Creek								
MLR-SW-5	0.10	1.60	2.29	2.10	1.80	4.34	0.81	1.86
MLR-SW-4	3.72	2.67	5.82	6.98	3.10	4.45	2.52	4.18

All measurements in cubic feet per second (cfs).
Monitoring sites shown in upstream to downstream order. Site locations shown on Figure 2-1.

2.2.2 Surface Water Quality

Baseline monitoring included measurement of field parameters and collection of water samples for laboratory analyses at each surface water monitoring site. Field parameters include dissolved oxygen concentrations, pH, specific conductance and water temperature. Laboratory analyses include major ion concentrations, nutrients and total recoverable metals (dissolved for aluminum; Table 2-4). The baseline surface water monitoring results are summarized in Table 2-5 with complete results presented in Appendix B.

General Chemistry

The 2013 through 2015 baseline monitoring data show surface waters from the Clark Fork River and side channel are a calcium-bicarbonate type, typical of limestone terrains and relatively non-impacted waters within the Clark Fork River drainage, while the Lorranson Creek water is a calcium-sulfate-bicarbonate type indicative of irrigation return flow effects. All surface waters in the Project area are alkaline with average field pH values ranging from 7.8 at the POND site (representing alluvial groundwater) to 8.4 at site SW-1 (head of the CFR side channel). Average TDS (total dissolved solids) concentrations at sites SW-1, -2, -3 and -6, all on or connected to the river, range from 254 mg/L at site SW-6 (downstream Clark Fork River) to 323 mg/L at side channel site SW-2. TDS concentrations at sites SW-1 and SW-6, representing Clark Fork River water quality, vary seasonally with higher concentrations during fall baseflow conditions and lower concentrations during spring runoff. TDS concentrations at sites SW-2 and SW-3 along the CFR side channel show no clear seasonal trends, suggesting water quality (and flow) conditions in the side channel are influenced primarily by irrigation return flows at the sites and less so by interactions with the local groundwater system. TDS concentrations were higher at the two Lorranson Creek sites as compared to the CFR or side channel, with an average TDS of 836 mg/L at upstream site SW-5 and 809 mg/L at SW-4.

TABLE 2-4. ANALYTICAL METHODS AND DETECTION LIMITS FOR MLR PROJECT SURFACE WATER AND GROUNDWATER SAMPLES

Parameter	Analytical Method[1]	Project-Required Detection Limit (mg/L)
Physical Parameters		
TDS	SM 2540C	10
TSS	SM 2540C	10
Common Ions		
Alkalinity	SM 2320B	4
Sulfate	300.0	1
Chloride	300.0/SM 4500CL-B	1
Fluoride	A4500-F C	0.1
Calcium	215.1/200.7	1
Magnesium	242.1/200.7	1
Sodium	273.1/200.7	1
Potassium	258.1/200.7	1
Nutrients		
Total Nitrogen (Persulfate)	A4500N-C	0.04
Total Phosphorus	365.1	0.003
Trace Constituents (SW - Total Recoverable except Aluminum [Dissolved], GW - Dissolved)[2]		
Aluminum (Al)	200.7/200.8	0.009
Antimony (Sb)	200.7/200.8	0.0005
Arsenic (As)	200.8/SM 3114B	0.001
Barium (Ba)	200.7/200.8	0.003
Beryllium (Be)	200.7/200.8	0.0008
Cadmium (Cd)	200.7/200.8	0.00003
Chromium (Cr)	200.7/200.8	0.01
Cobalt (Co)	200.7/200.8	0.005
Copper (Cu)	200.7/200.8	0.002
Iron (Fe)	200.7/200.8	0.02
Lead (Pb)	200.7/200.8	0.0003
Manganese (Mn)	200.7/200.8	0.005
Mercury (Hg)	245.2/245.1/200.8/SM 3112B	0.000005
Molybdenum (Mo)	200.7/200.8	0.001
Nickel (Ni)	200.7/200.8	0.002
Selenium (Se)	200.7/200.8/SM 3114B	0.001
Silver (Ag)	200.7/200.8	0.0002
Strontium (Sr)	200.7/200.8	0.02
Thallium (Tl)	200.7/200.8	0.0002
Uranium	200.7/200.8	0.0002
Zinc (Zn)	200.7/200.8	0.008
Field Parameters		
Stream Flow	HF-SOP-37/-44/-46	NA
Water Temperature	HF-SOP-20	0.1 °C
Dissolved Oxygen (DO)	HF-SOP-22	0.1 mg/L
pH	HF-SOP-20	0.1 s.u.
Specific Conductance (SC)	HF-SOP-79	1 µmhos/cm

(1) Analytical methods are from *Standard Methods for the Examination of Water and Wastewa*ter (SM) or EPA's *Methods for Chemical Analysis of Water and Waste* (1983).

(2) Samples to be analyzed for dissolved constituents are field-filtered through a 0.45 µm filter.

TABLE 2-5. SUMMARY OF BASELINE SURFACE WATER QUALITY DATA-MONTANA LIMESTONE RESOURCES

Hydrologic Feature		*Clark Fork River/Side Channel*																					*Lorranson Creek*									*Alluvial GW Pond*				
Monitoring Station		**MLR-SW-1**					**MLR SW-2**					**MLR SW-3**					**MLR-SW-6**					**MLR-SW-4**					**MLR-SW-5**								
FIELD PARAMTERS	**Units**	**N**	**# Det**	**Min**	**Max**	**Ave**	**N**	**# Det**	**Min**	**Max**	**Ave**	**N**	**# Det**	**Min**	**Max**	**Ave**	**N**	**# Det**	**Min**	**Max**	**Ave**	**N**	**# Det**	**Min**	**Max**	**Ave**	**N**	**# Det**	**Min**	**Max**	**Ave**	**N**	**# Det**	**Min**	**Max**	**Ave**
Flow (cfs)	cfs	7	7	2.55	15.95	7.53	6	6	0.55	4.27	2.22	6	6	0.07	1.13	0.54	0	0	NA	NA	NA	7	7	2.52	6.98	4.18	7	7	0.10	4.34	1.86	NA	NA	NA	NA	NA
Dissolved Oxygen	mg/L	7	7	7.70	12.08	9.96	6	6	5.09	11.30	8.38	6	6	5.73	11.86	8.83	7	7	6.60	13.60	10.04	7	7	7.69	11.73	9.90	7	7	8.08	12.29	10.15	7	7	4.88	10.81	7.88
pH	S.U.	7	7	8.03	8.68	8.43	6	6	7.56	8.21	7.90	6	6	7.83	8.61	8.22	7	7	7.90	8.45	8.21	7	7	7.97	8.54	8.25	7	7	8.03	8.50	8.21	7	7	7.43	8.13	7.78
Conductivity	µmhos/cm	7	7	332	582	469	6	6	455	570	493	6	6	421	495	467	7	7	298	448	398	7	7	106	1224	976	7	7	820	1237	1109	7	7	604	817	713
Water Temperature	°C	7	7	1.2	20.7	14.4	6	6	0.6	21.4	13.5	6	6	0.4	20.0	13.1	7	7	0.7	19.4	12.7	7	7	2.2	16.4	12.8	7	7	3.7	17.8	13.2	7	7	2.6	20.7	14.4
PHYSICAL PROPERTIES																																				
Total Suspended Solids	mg/L	7	5	<10	41	15	6	1	<10	12	6	4	1	<10	41	16	7	4	<10	58	17	7	7	11	88	37	7	5	<10	24	14	7	1	<10	14	NA
Total Dissolved Solids	mg/L	7	7	220	392	307	6	6	286	376	323	6	6	273	323	300	7	7	212	291	254	7	7	757	855	809	7	7	737	964	836	7	7	403	548	478
INORGANICS																																				
Total Alk-as CaCO3	mg/L	7	7	120	200	161	6	6	150	170	163	6	6	140	170	158	7	7	120	180	153	7	7	240	260	251	7	7	240	270	253	7	7	190	230	213
Chloride	mg/L	7	7	3	14	7	6	6	6	10	7	6	6	5	8	7	7	7	3	11	6	7	7	19	32	25	7	7	9	42	34	7	7	8	15	11
Sulfate	mg/L	7	7	35	120	75	6	6	61	111	80	6	6	54	91	72	7	7	23	71	50	7	7	306	371	344	7	7	275	480	343	7	7	109	194	155
Fluoride	mg/L	7	7	0.3	0.5	0.4	6	6	0.4	0.5	0.4	6	6	0.4	0.5	0.4	7	7	0.3	0.5	0.4	7	7	0.5	0.6	0.5	7	7	0.5	0.5	0.5	7	7	0.5	0.6	0.5
NUTRIENTS			0																																	
Nitrogen, Total	mg/L	7	5	<0.01	0.41	0.17	6	5	<0.01	0.50	0.25	6	5	<0.01	0.41	0.23	7	5	<0.01	0.50	0.20	7	6	<0.01	0.30	0.15	7	5	<0.01	0.37	0.20	7	5	<0.01	0.38	0.17
Phosphorus, Total as P	mg/L	7	7	0.022	0.063	0.039	6	6	0.018	0.06	0.046	6	6	0.022	0.055	0.036	7	7	0.018	0.074	0.034	7	7	0.053	0.132	0.094	7	7	0.066	0.166	0.106	7	7	0.008	0.040	0.021
TOTAL RECOVERABLE METALS																																				
Aluminum (dissolved)	mg/L	7	0	<0.009	<0.009	NA	6	0	<0.009	<0.009	NA	4	1	<0.009	0.011	0.006	7	2	<0.009	0.026	0.009	7	2	<0.009	0.060	0.013	7	1	<0.009	0.017	NA	7	0	<0.009	<0.009	NA
Antimony	mg/L	7	6	0.0003	0.0008	0.0006	6	1	<0.0005	0.0006	0.0003	5	3	<0.0005	0.0006	0.00	7	5	<0.0005	0.0009	0.0006	7	0	<0.0005	<0.0005	NA	7	0	<0.0005	<0.0005	NA	7	0	<0.0005	<0.0005	NA
Arsenic	mg/L	7	7	0.009	0.018	0.013	6	6	0.008	0.015	0.012	6	6	0.002	0.015	0.011	7	7	0.009	0.019	0.013	7	7	0.017	0.019	0.018	7	7	0.003	0.013	0.011	7	7	0.004	0.005	0.004
Barium	mg/L	7	7	0.057	0.074	0.064	6	6	0.058	0.071	0.064	6	6	0.051	0.077	0.063	7	7	0.056	0.081	0.066	7	7	0.053	0.078	0.061	7	7	0.056	0.087	0.067	7	7	0.083	0.110	0.093
Beryllium	mg/L	7	0	<0.0008	<0.0008	NA	6	0	<0.0008	0.0004	0.0004	4	0	<0.0008	<0.0008	NA	7	0	<0.0008	<0.0008	NA	7	0	<0.0008	<0.0008	NA	7	0	<0.0008	<0.0008	NA	7	0	<0.0008	<0.0008	NA
Cadmium	mg/L	7	6	<0.00003	0.00019	0.00007	6	6	0.00003	0.00007	0.00005	6	5	<0.00003	0.00011	0.00007	7	7	0.00003	0.00026	0.00011	7	3	<0.00003	0.00006	0.00003	7	0	<0.00003	<0.00003	NA	7	5	<0.00003	0.00006	0.00004
Calcium	mg/L	7	7	43	76	59	6	6	52	68	59	6	6	48	61	55	7	7	39	57	51	7	7	125	147	136	7	7	129	195	150	7	7	74	101	91
Chromium	mg/L	7	0	0.003	0.005	NA	6	0	<0.005	<0.01	NA	6	0	<0.005	<0.01	NA	7	0	<0.005	<0.01	NA	7	0	<0.005	<0.01	NA	7	0	<0.005	<0.01	NA	7	0	<0.005	<0.01	NA
Cobalt	mg/L	7	0	0.003	0.005	NA	6	0	<0.005	<0.01	NA	6	0	<0.005	<0.01	NA	7	0	<0.005	<0.01	NA	7	0	<0.005	<0.01	NA	7	0	<0.005	<0.01	NA	7	0	<0.005	<0.01	NA
Copper	mg/L	7	7	0.005	0.043	0.015	6	6	0.006	0.012	0.008	6	5	<0.002	0.018	0.009	7	7	0.006	0.055	0.018	7	2	<0.002	0.003	0.001	7	0	<0.002	<0.002	NA	7	0	<0.002	<0.002	NA
Iron	mg/L	7	7	0.13	0.98	0.35	6	6	0.04	0.33	0.13	6	5	<0.01	0.37	0.13	7	7	0.04	1.20	0.37	7	7	0.35	2.13	0.87	7	7	0.22	0.65	0.39	7	5	<0.02	0.06	0.03
Lead	mg/L	7	6	<0.0003	0.0074	0.0022	6	1	<0.0003	0.0019	0.0007	6	5	<0.0003	0.0014	0.0006	7	6	<0.0003	0.0095	0.0026	7	5	<0.0003	0.0013	0.0006	7	3	<0.0003	0.0005	0.0002	7	0	<0.0003	<0.0003	NA
Magnesium	mg/L	7	7	10	20	15	6	6	12	18	15	6	6	11	17	14	7	7	9	15	13	7	7	34	40	36	7	7	27	36	33	7	7	19	25	22
Manganese	mg/L	7	7	0.023	0.128	0.061	6	6	0.009	0.046	0.023	6	6	0.005	0.213	0.046	7	7	0.022	0.154	0.069	7	7	0.034	0.100	0.055	7	7	0.090	0.162	0.118	7	7	0.093	0.422	0.239
Mercury	mg/L	7	7	0.000005	0.00015	0.00004	6	3	<0.000005	0.00002	0.000006	4	1	<0.000005	0.000007	0.000004	7	7	0.00001	0.00026	0.00005	7	2	<0.000005	0.000006	0.000003	7	1	<0.000005	0.000005	NA	7	0	<0.000005	<0.000005	NA
Molybdenum	mg/L	7	7	0.003	0.006	0.004	6	6	0.003	0.005	0.004	6	6	0.003	0.005	0.004	7	7	0.002	0.004	0.003	7	7	0.010	0.021	0.016	7	6	<0.002	0.007	0.006	7	7	0.004	0.007	0.006
Nickel	mg/L	7	0	<0.002	<0.002	NA	6	0	<0.001	<0.002	NA	4	1	<0.002	0.001	0.001	7	0	<0.001	<0.002	NA	7	0	<0.001	<0.002	NA	7	1	<0.001	<0.002	NA	7	2	<0.002	0.001	0.001
Potassium	mg/L	7	7	3	6	5	6	6	4	7	5	6	6	3	6	5	7	7	2	4	3	7	7	16	18	17	7	7	4	16	13	7	7	5	6	6
Selenium	mg/L	7	2	0.0003	0.0005	0.00047	6	1	<0.001	0.0002	NA	6	0	<0.0002	<0.001	NA	7	0	<0.0002	<0.001	NA	7	7	0.001	0.003	0.002	7	6	<0.0002	0.003	0.002	7	0	<0.0002	<0.001	NA
Silver	mg/L	7	1	<0.0002	0.0002	0.0029	6	0	<0.0002	<0.02	NA	6	0	<0.0002	<0.02	NA	7	1	<0.0002	<0.02	NA	7	0	<0.0002	<0.02	NA	7	0	<0.0002	<0.02	NA	7	0	<0.0002	<0.02	NA
Sodium	mg/L	7	7	10	24	17	6	6	14	23	17	6	6	14	21	17	7	7	9	17	14	7	7	46	59	52	7	7	44	55	49	7	7	25	30	27
Strontium	mg/L	7	7	0.260	0.624	0.413	6	6	0.290	0.640	0.415	6	6	0.280	0.500	0.380	7	7	0.200	0.374	0.276	7	7	1.62	1.82	1.72	7	7	1.50	2.22	1.64	7	7	0.500	0.640	0.577
Thallium	mg/L	7	0	<0.0002	<0.0002	NA	6	0	<0.0002	<0.0002	NA	6	0	<0.0002	<0.0002	NA	7	0	<0.0002	<0.0002	NA	7	0	<0.0002	<0.0002	NA	7	0	<0.0002	<0.0002	NA	7	0	<0.0002	<0.0002	NA
Uranium	mg/L	7	5	0.003	0.008	0.005	6	5	<0.008	0.008	0.005	6	5	<0.008	0.008	0.004	7	5	<0.008	0.008	0.005	7	7	0.008	0.012	0.010	7	6	<0.008	0.011	0.008	7	5	<0.008	0.007	0.005
Zinc	mg/L	7	6	<0.008	0.046	0.019	6	6	0.008	0.020	0.014	5	4	<0.008	0.025	0.014	7	6	<0.008	0.063	0.022	7	2	<0.008	0.004	0.004	7	2	<0.008	0.004	0.004	7	0	<0.002	<0.008	NA

N - Number of samples

#Det - Number of results greater than Project Required Detection Limit

Below detection values replaced with 1/2 the PRDL for calculation of average concentrations.

NA - Average not calculated where fewer than two results are greater than PRDL.

Duplicate samples not included in stats

Monitoring site locations shown on Figure 2-1.

The higher TDS concentrations at these sites are attributed to the effects of irrigation return flows south of the Project area. Sulfate and chloride concentrations also reflect the impacts of irrigation return flows on surface water quality. Average sulfate and chloride concentrations at Lorranson Creek sites SW-4 and SW-5 are relatively high (approximately 350 mg/L sulfate and 30 mg/L chloride), as compared to the more dilute river and side channel sites (approximately 70 mg/L sulfate and 7 mg/L chloride).

Nutrients

Total nitrogen (TN) concentrations are relatively consistent throughout the Project area with average TN concentrations 0.17 to 0.25 mg/L in CFR/side channel sites SW-1, SW-2, SW-3 and SW-6; 0.15 to 0.20 mg/L in Lorranson Creek sites SW-4 and SW-5; and 0.17 mg/L at the POND site (Table 2-5). Conversely, total phosphorus (TP) concentrations are relatively consistent within each drainage but vary from drainage to drainage, with average TP concentrations of 0.034 to 0.046 mg/L in the CFR/side channel sites, 0.094 to 0.106 mg/L in the Lorranson Creek sites; and 0.021 mg/L at the POND site.

Example target levels for TN and TP for the Middle Rockies Level III Ecoregion are presented in the Central Clark Fork Tributary TMDL (MDEQ, 2014). The average nutrient concentrations for each drainage area along with the example target concentrations are presented below. As shown, average TN concentrations are less than the example targets in all drainages, while average TP concentrations are higher than the TP targets in Lorranson Creek and lower than the targets elsewhere. The higher TP concentrations in the Lorranson Creek sites are likely attributable to irrigation return flows, and possibly to the presence of volcanic rocks in the drainage which have been shown to leach phosphorous (MDEQ, 2014). It should be noted that the example target levels are presented for reference only and do not represent established water quality standards.

	CFR/Side Channel	**Lorranson Creek**	**POND**	**TMDL Target Values**
Ave TN - mg/L	0.21	0.20	0.17	<0.30
Ave TP - mg/L	0.029	0.110	0.021	<0.03

TN-Total Nitrogen
TP-Total Phosphorus
Example target values are for Middle Rockies Ecoregion as presented in MDEQ, 2014.

Trace Metals

Baseline surface water samples were analyzed for a full suite of trace metal constituents with metals analyses based on the total recoverable fraction except for aluminum (dissolved) (Table 2-4). Trace metal concentrations generally were low in all surface water samples, with many constituents near or below the analytical reporting limits (which are consistent with Circular DEQ-7 required reporting values). Constituents consistently near or below the reporting limits include total recoverable beryllium, chromium, cobalt, thallium, nickel, silver and aluminum (dissolved). Conversely, arsenic, barium, manganese and strontium were present above reporting limits in all surface water samples. Table 2-6 shows the percentage of water samples with concentrations above the reporting limits for

TABLE 2-6. DETECTABLE METALS CONCENTRATIONS IN BASELINE SURFACE WATER QUALITY SAMPLES

Waterbody	***CFR/Side Channel***			***Lorranson Creek***			***POND***		
Parameter	# Samples	# Detects	% Detects	# Samples	# Detects	% Detects	# Samples	# Detects	% Detects
Aluminum (dissolved)	24	3	13%	14	3	21%	7	0	0%
Antimony	25	15	60%	14	0	0%	7	0	0%
Arsenic	26	26	100%	14	14	100%	7	7	100%
Barium	26	26	100%	14	14	100%	7	7	100%
Beryllium	24	0	0%	14	0	0%	7	0	0%
Cadmium	26	24	92%	14	3	21%	7	5	71%
Chromium	26	0	0%	14	0	0%	7	0	0%
Cobalt	26	0	0%	14	0	0%	7	0	0%
Copper	26	25	96%	14	2	14%	7	0	0%
Iron	26	25	96%	14	14	100%	7	5	71%
Lead	26	18	69%	14	8	57%	7	0	0%
Manganese	26	26	100%	14	14	100%	7	7	100%
Mercury	24	18	75%	14	3	21%	7	0	0%
Molybdenum	26	26	100%	14	13	93%	7	7	100%
Nickel	24	1	4%	14	1	7%	7	2	29%
Selenium	26	3	12%	14	13	93%	7	0	0%
Silver	26	2	8%	14	0	0%	7	0	0%
Strontium	26	26	100%	14	14	100%	7	7	100%
Thallium	26	0	0%	14	0	0%	7	0	0%
Uranium	26	20	77%	14	13	93%	7	5	71%
Zinc	25	22	88%	14	4	29%	7	0	0%
TOTAL	**536**	**306**	**57%**	**294**	**133**	**45%**	**147**	**52**	**35%**

Metals analyses are for total recoverable fraction except aluminum (dissolved).
CFR/Side Channel includes sites MLR SW-1, SW-2, SW-3 and SW-6.
Lorranson Creek includes sites MLR SW-4 and SW-5.
Based on total recoverable metals concentrations except aluminum (dissolved).

each trace metal constituent for the CFR/side channel monitoring sites, the Lorranson Creek sites, and the alluvial groundwater-fed POND site. CFR/Side Channel sites SW-1, SW-2, SW-3 and SW-6 had the highest percentage of detectable metals results at 57%, with Lorranson Creek sites SW-4 and SW-5 at 45% and the POND site 35%. The detectable metals concentrations in the CFR/side channel sites are due primarily to upstream sources since upstream site SW-1 at the Clark Fork River diversion headgate had similar concentrations to downstream site SW-6 for most parameters.

The water quality results were also compared to applicable water quality standards to determine the frequency and magnitude of baseline water quality exceedances and provide a reference for baseline concentrations. Based on the B-1 classification of Project area surface waters, the analytical results were compared to the numeric human health standards (HHS) and aquatic criteria in MDEQ Circular DEQ-7 (MDEQ, 2017). For the metals cadmium, copper, lead, nickel, silver and zinc, the aquatic criteria were adjusted for water hardness with the hardness calculated from the calcium and magnesium analytical results. The water quality exceedance summary is included in Table 2-7 with the full evaluation included in Appendix B.

Of the 21 trace metals analyzed, arsenic was the only analyte with concentrations consistently greater than the applicable surface water quality standards, with arsenic exceeding the 0.01 mg/L HHS in 32 of 47 site-wide surface water samples (Table 2-7). Arsenic consistently exceeded the HHS in most samples from the CFR/side channel (sites SW-1, 2, 3, 4 and 6), and Lorranson Creek (SW-4 and 5), with concentrations ranging from 0.002 to 0.019 mg/L (Table 2-5). In both the CFR/side channel and Lorranson Creek sites, the upstream arsenic concentrations were similar to downstream concentrations, indicating that the source of arsenic is upgradient of the MLR property (historic mining, irrigation return flows and/or natural arsenic loading from tertiary sediments and volcanic rocks). The alluvial groundwater-fed POND is the only site where no arsenic exceedances were recorded.

The only other water quality exceedances in the baseline dataset include four exceedances for copper, two for iron, two for lead, and one for mercury. The copper, iron and lead exceedances are all relative to the acute aquatic criteria with the one mercury exceedance relative to the HHS. With the exception of one iron exceedance at site SW-4, all of these exceedance occurred in the CFR/side channel sites during high flow conditions indicating the exceedances may be related to suspended sediment in the river. The one mercury exceedance (0.00026 mg/L verses the 0.00005 mg/L HHS) occurred at downstream CFR site SW-6 during the June 2014 high flow sampling event.

Of the five parameters recording one or more water quality exceedance, arsenic exceeded the 0.01 mg/L HHS in 68% of the baseline surface water samples, copper exceeded the aquatic criteria in 9%, lead and iron in 4%, and mercury exceeded the HHS in 2% of samples. Overall, out of a total of 1081 metals analyses, the baseline dataset includes 41 water quality exceedances for an overall exceedance rate of 4% (Table 2-7).

TABLE 2-7. BASELINE SURFACE WATER MONITORING WATER QUALITY EXCEEDANCE SUMMARY

Parameter	No. Samples	No. HHS Exceedences	No. Aquatic Criteria Exceedences	Total Exceedences	% Exceedences
Aluminum	47	0	0	0	0%
Antimony	47	0	0	0	0%
Arsenic	47	32	0	32	68%
Barium	47	0	0	0	0%
Beryllium	47	0	0	0	0%
Cadmium	47	0	0	0	0%
Calcium	47	0	0	0	0%
Chromium	47	0	0	0	0%
Cobalt	47	0	0	0	0%
Copper	47	0	4	4	9%
Iron	47	0	2	2	4%
Lead	47	0	2	2	4%
Magnesium	47	0	0	0	0%
Manganese	47	0	0	0	0%
Mercury	47	1	0	1	2%
Molybdenum	47	0	0	0	0%
Nickel	47	0	0	0	0%
Selenium	47	0	0	0	0%
Silver	47	0	0	0	0%
Strontium	47	0	0	0	0%
Thallium	47	0	0	0	0%
Uranium	47	0	0	0	0%
Zinc	47	0	0	0	0%
TOTAL	**1081**	**33**	**8**	**41**	**4%**

HHS – Human Health Standard
Exceedance summary based on total recoverable metals concentrations, except aluminum (dissolved).
Complete exceedance evaluation included in Appendix B.

2.2.3 Sediment Chemistry

Stream bed sediment samples were collected at various surface water monitoring sites during the June and October 2014 monitoring events (Table 2-2). As described in the Project SAP (Hydrometrics, 2014), baseline sediment sampling followed the general procedures described by MDEQ in their Water Quality Bureau Field Procedures Manual for Water Quality Assessment Monitoring (Version 3.2), with sediment sampling and analysis targeting the <2 mm sediment fraction (sand, silt and clay). A previous investigation of sediments in the Clark Fork River and tributaries (Davis and Atkins, 2001) characterized both the fine-grained (<63 µm) and sand size (63 µm – 2 mm) fractions, and found that, although metals concentrations were higher in the fine fraction, because of the prevalence of coarser particles in the grain-size distribution, the 63 µm – 2 mm size fraction contained a significant portion (50-60%) of the total metal mass. In addition, as noted by Axtmann and Luoma (1991) and Moore et al. (1989), for water bodies dominated by coarse-grained sediments, the typically higher concentration fine-grained material may not be the most important fraction of the total metal load. Therefore, the <2 mm fraction was selected as an appropriate particle size range for general characterization of sediment metals chemistry under baseline conditions. The sediment analytical parameter list is included in Table 2-8.

The sediment sample analytical results are show in Table 2-9. For most metals, the highest metal concentrations occurred in samples from CFR/side channel sites SW-1, SW-2, SW-3 and SW-6. Concentrations at these sites are relatively consistent from site to site as well as seasonally. Strontium is the only outlier with the highest concentrations occurring at Lorranson Creek sites SW-4/SW-5. For the majority of metals, the single highest concentrations occurred at downstream CFR site SW-6, and the lowest concentrations at the POND site representing alluvial groundwater.

TABLE 2-8. ANALYTICAL METHODS AND DETECTION LIMITS FOR SEDIMENT SAMPLES

Parameter	Analytical Method[1]	Project-Required Detection Limit (mg/kg)
Trace Constituents		
Aluminum (Al)	3050/6000 Series	5
Antimony (Sb)	3050/6000 Series	1
Arsenic (As)	3050/6000 Series	1
Barium (Ba)	3050/6000 Series	1
Beryllium (Be)	3050/6000 Series	1
Cadmium (Cd)	3050/6000 Series	1
Chromium (Cr)	3050/6000 Series	1
Cobalt (Co)	3050/6000 Series	1
Copper (Cu)	3050/6000 Series	1
Iron (Fe)	3050/6000 Series	1
Lead (Pb)	3050/6000 Series	1
Manganese (Mn)	3050/6000 Series	1
Mercury (Hg)	7471/7473	0.1
Molybdenum (Mo)	3050/6000 Series	1
Nickel (Ni)	3050/6000 Series	1
Selenium (Se)	3050/6000 Series	1
Silver (Ag)	3050/6000 Series	1
Strontium (Sr)	3050/6000 Series	1
Thallium (Tl)	3050/6000 Series	1
Uranium	3050/6000 Series	1
Zinc (Zn)	3050/6000 Series	1

(1) Analytical methods are from EPA's *Test Methods for Evaluating Solid Waste – Physical/Chemical Methods (SW-846)*, available at http://www.epa.gov/osw/hazard/testmethods/sw846/online/index.htm.

TABLE 2-9. STREAMBED SEDIMENT CHEMISTRY ANALYTICAL DATA

SITE CODE	MLR SW-1		MLR SW-2		MLR SW-3		MLR SW-4		MLR SW-5		MLR SW-6	POND
DATE	6/26/2014	10/30/2014	6/26/2014	10/30/2014	6/26/2014	10/30/2014	6/26/2014	10/30/2014	6/26/2014	10/30/2014	**10/30/2014**	10/30/2014
Moisture (%)	54.5	45.2	54.4	61.6	51.9	51.9	54	48.8	50.6	54.5	77.3	29.9
Aluminum	11600	11700	18200	26800	11200	16900	8240	13200	9450	21600	15400	7520
Antimony	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1
Arsenic	40	29	27	40	19	20	6	10	8	9	45	3
Barium	210	214	169	206	138	165	157	199	217	312	266	94
Beryllium	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium	1	<1	1	2	<1	<1	<1	<1	<1	<1	1	<1
Chromium	15	13	19	24	16	21	8	7	7	11	17	11
Cobalt	6	6	7	9	6	7	4	5	5	7	7	4
Copper	298	229	266	356	83	108	14	14	13	20	403	12
Iron	15000	14300	16700	22700	12700	15700	10900	15000	11900	18300	17600	9020
Lead	52	42	52	77	22	28	7	7	7	10	80	5
Manganese	600	494	515	624	366	465	409	674	763	592	1100	400
Molybdenum	<1	<1	<1	1	<1	<1	<1	<1	1	1	1	<1
Nickel	11	10	14	15	15	15	6	5	5	8	12	8
Selenium	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
Silver	1	1	1	2	<1	<1	<1	<1	<1	<1	3	<1
Strontium	61	67	56	75	55	63	164	240	265	284	73	54
Thallium	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Uranium	1.3	1.8	2.9	5.4	1.8	2.1	1.2	1.5	1.7	1.7	2.6	1
Zinc	493	390	391	665	253	332	36	40	37	50	693	30
Mercury	0.97	0.74	0.93	0.71	0.2	0.16	<0.1	<0.1	<0.1	<0.1	1.7	<0.1

All concentrations in mg/Kg except moisture content (%).
Sample locations shown on Figure 2-1.

3.0 GROUNDWATER

Hydrogeologic information for the Project area has been obtained through completion of six groundwater monitoring wells, six piezometers and two old homestead wells located on the property. Three distinct groundwater systems have been identified in the Project area including the Clark Fork River floodplain shallow alluvial aquifer, a bedrock groundwater system within the Cretaceous age and older geologic units (i.e., Quadrant Quartzite, Madison Limestone), and a perched groundwater system within the Tertiary-age sedimentary units. Baseline groundwater data collection began with completion of the six monitoring wells in June/July 2014, with groundwater sampling events conducted in June/July, August and October 2014, and April, July and October 2015 (Table 2-2). Groundwater level monitoring occurred on a more frequent basis. The baseline monitoring program and results are described below.

3.1 MONITORING WELL COMPLETION

Six monitoring wells were completed in the Project area in June/July 2014 to delineate the site stratigraphy, determine the occurrence and depths to groundwater, and for collection of groundwater samples. Monitoring well locations are shown on Figure 2-1 and described in Table 3-1. The monitoring wells are distributed throughout the proposed mine area to provide information on groundwater occurrence. All monitoring wells were drilled using standard air rotary drilling techniques and completed with 4-inch ID schedule 40 PVC casing and 10-slot PVC screen. Well completion logs are included in Appendix C.

TABLE 3-1. MONITORING WELL COMPLETION DETAILS

Well	Latitude	Longitude	MP Elevation	Screen Interval	Lithology
MW-1	46.6666	-113.1852	3957.83	95-125	Mudstone
MW-2	46.6751	-113.2127	4321.50	480-600	Madison Limestone
MW-3D	46.6868	-113.2059	3907.80	58-98	Mudstone
MW-3S	46.6867	-113.2059	3907.16	20.5-30.5	Alluvium/Colluvium
MW-4	46.6881	-113.2039	3902.07	8-18	Alluvium
MW-5	46.6816	-113.1966	3910.54	7.5-17.5	Alluvium

Monitoring well locations shown on Figure 2-1.
MP-Water level measuring point; top of PVC casing.
Coordinates in MT State Plane NAD83, International Feet; Elevations NAVD88

3.2 GROUNDWATER LEVEL MONITORING

Groundwater levels have been measured periodically since the wells were completed. In addition, water level data loggers were installed in most wells in August 2014 for continuous groundwater level and temperature monitoring (a data logger could not be installed in well MW-2 due to annular space

constraints). Manual water level data from primary monitoring sites is included in Table 3-2 with additional data provided in Appendix D.

Depths to groundwater vary widely across the MLR site based on well location and hydrostratigraphic unit. Groundwater depths in CFR alluvial wells MW-4 and MW-5 are on the order of 10 feet or less below ground surface (bgs), while the depth to groundwater is close to 500 feet bgs in well MW-2 completed in the Mission Canyon Formation of the Madison Limestone. Average depths to groundwater at other monitoring wells include 27.42 feet at well MW-1 (completed in maroon mudstone), 25.15 feet at MW-3S (alluvium/colluvium), 38.05 feet at MW-3D (gray to green-gray mudstone), and 16.46 to 25.57 feet bgs at piezometers B-2, B-3, B-4 and B-6 (completed in the Tertiary Renova Formation). Similarly, groundwater elevations vary by area and hydrostratigraphic unit, with average groundwater elevations highest (4264.47 to 4331.84 feet) in the Renova Formation piezometers, and lowest (3825.37 feet) at Madison Limestone well MW-2 (Table 3-2). The significant variability in groundwater elevations suggests limited hydrologic connection between the different hydrostratigraphic units.

Figure 3-1 includes hydrographs for the MLR monitoring wells and piezometers. With the exception of well MW-3D, groundwater levels have remained remarkably stable throughout the monitoring period. Measured water levels at wells MW-2, MW-3S, MW-4 and MW-5 all vary by about three feet or less between June 30, 2014 and October 6, 2015, while the piezometer water levels vary by about one foot or less. Uniform seasonal groundwater levels are usually attributable to either a lack of seasonal recharge or a high aquifer transmissivity. Based on drilling conditions and preliminary aquifer testing, as described below, the lack of seasonal variability in the MLR bedrock monitoring wells and piezometers is indicative of limited groundwater recharge. The large water level fluctuations observed at MW-3D (50 feet) are due to rapid drawdown and slow recharge of the well following purging and sampling. The water level at MW-3D would most likely be similarly stable as the other wells under static conditions (see MW-3D transducer hydrograph, Appendix D). Based on the January 6, 2015 measurements, when all monitoring wells were in a static condition, the range of groundwater elevations from highest to lowest is as follows: 3928.08 feet amsl at MW-1 (completed in mudstone); 3900.97 at MW-5 (alluvium), 3892.57 at MW-4 (alluvium); 3881.94 at MW-3S (alluvium/colluvium); 3879.30 at MW-3D (mudstone) and 3824.53 at MW-2 (Madison Limestone, Table 3-2).

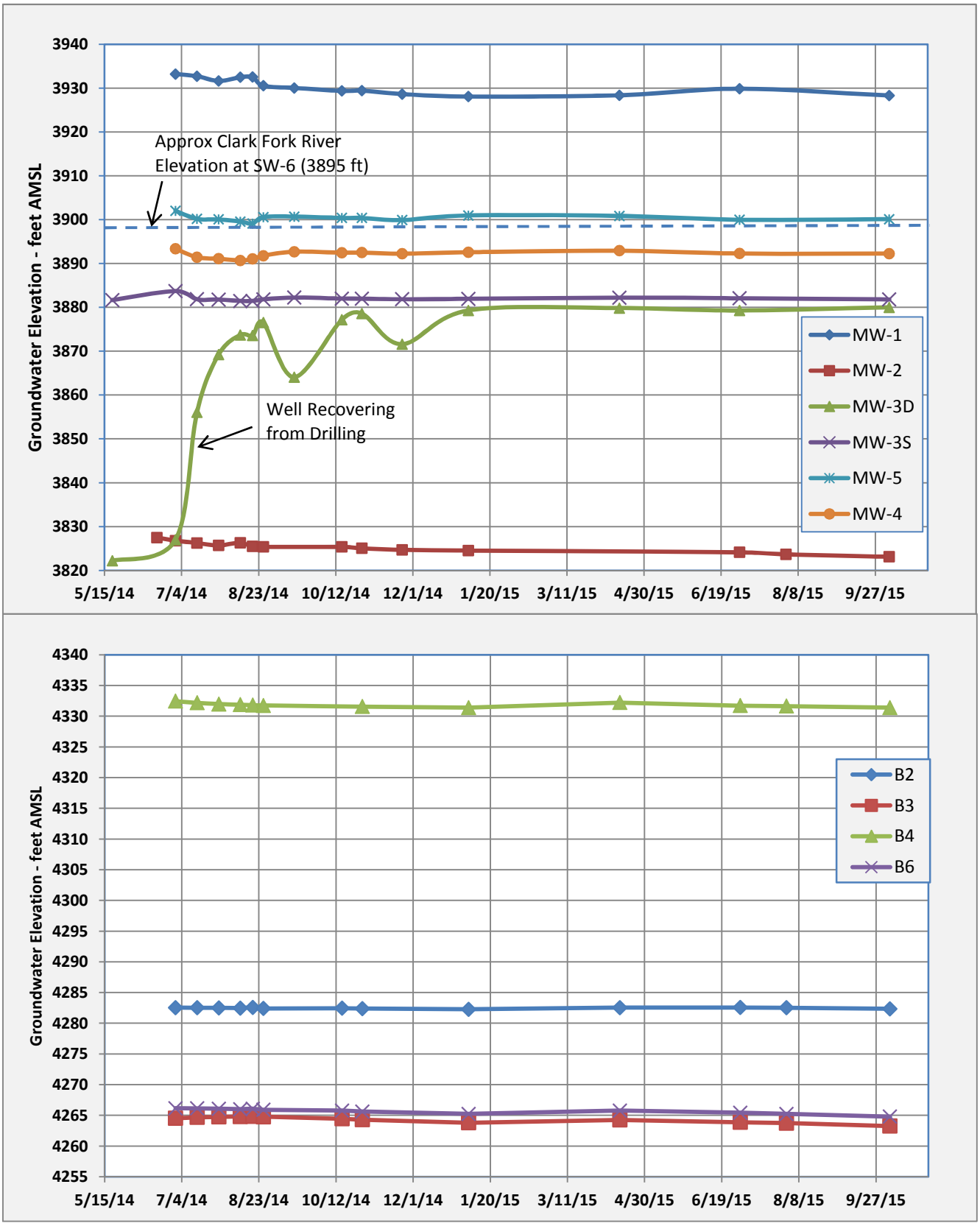
The groundwater elevation at well MW-2, completed in Madison Limestone at 480 to 600 feet bgs, is of interest for two reasons. First, the groundwater elevation at MW-2 is 65 to 75 feet lower in elevation than the Clark Fork River alluvial groundwater (MW-4 and MW-5), and the Clark Fork River itself (Figure 3-1). The lower bedrock groundwater elevation near the proposed quarry area compared to the Clark Fork River/alluvial groundwater system suggests either limited interconnection between the two systems, or that the river loses flow to groundwater in this area. Either way, the relative groundwater levels indicate that bedrock groundwater in the proposed quarry area (represented by well MW-2) does not recharge the Clark Fork River in the vicinity of the MLR Project. Second, the groundwater elevation at MW-2, 3825 feet average, is more than 200 feet lower

TABLE 3-2. GROUNDWATER LEVEL MONITORING DATA
MONTANA LIMESTONE RESOURCES PROJECT

WELL	Screen Interval	Depth to Groundwater - feet from top of well casing																
		6/30/14	7/14/14	7/28/14	8/11/14	8/19/14	8/26/14	9/15/14	10/16/14	10/29/14	11/24/14	1/6/15	4/14/15	7/31/15	10/6/15	Min	Max	Mean
MLR MW-1 (Cretaceous)	95-125	24.63	25.11	26.19	25.35	25.30	27.29	27.79	28.48	28.40	29.19	29.75	29.46	nm	29.52	24.63	29.75	27.42
MLR MW-2 (Madison)	480-600	494.72	495.25	495.82	495.22	496.03	496.14	nm	496.14	496.46	496.82	496.97	nm	497.85	nm	494.72	497.85	496.13
MLR MW-3D (Creatceous)	58-98	80.81	51.71	38.58	34.10	34.22	31.28	43.74	30.59	29.22	36.20	28.50	27.96	nm	27.80	27.80	80.81	38.05
MLR MW-3S (Alluvium/Colluvium)	20.5-30.5	23.45	25.32	25.38	25.70	25.70	25.34	24.92	25.16	25.18	25.32	25.22	24.96	nm	25.35	23.45	25.70	25.15
MLR MW-4 (CFR Alluvium)	7.5-17.5	8.70	10.65	10.98	11.38	11.04	10.29	9.38	9.61	9.58	9.84	9.50	9.16	nm	9.81	8.70	11.38	9.99
MLR MW-5 (CFR Alluvium)	8-18	8.53	10.36	10.48	10.97	11.41	9.95	9.84	10.14	10.15	10.64	9.57	9.68	nm	10.44	8.53	11.41	10.17
B-2 (Tertiary)	40-50	23.14	23.15	23.18	23.22	23.10	23.27	nm	23.24	23.29	nm	23.41	nm	23.15	nm	23.10	23.41	23.22
B-3 (Tertiary)	20-30	16.40	16.25	16.18	16.12	16.07	16.15	nm	16.48	16.64	nm	17.13	nm	17.20	nm	16.07	17.20	16.46
B-4 (Tertiary)	22-32	21.02	21.28	21.50	21.60	21.65	21.72	nm	nm	21.89	nm	22.07	nm	21.82	nm	21.02	22.07	21.62
B-6 (Tertiary)	22-32	25.23	25.26	25.31	25.38	25.31	25.48	nm	25.61	25.77	nm	26.16	nm	26.16	nm	25.23	26.16	25.57

WELL	MP Elevation	Groundwater Elevation - feet above means sea level (NAVD 88 vertical datum)																
		6/30/14	7/14/14	7/28/14	8/11/14	8/19/14	8/26/14	9/15/14	10/16/14	10/29/14	11/24/14	1/6/15	4/14/15	7/31/15	10/6/15	Min	Max	Mean
MW-1	3957.83	3933.20	3932.72	3931.64	3932.48	3932.53	3930.54	3930.04	3929.35	3929.43	3928.64	3928.08	3928.37	nm	3928.31	3928.08	3933.20	3930.41
MW-2	4321.50	3826.78	3826.25	3825.68	3826.28	3825.47	3825.36	nm	3825.36	3825.04	3824.68	3824.53	nm	3823.65	nm	3823.65	3826.78	3825.37
MW-3D	3907.80	3826.99	3856.09	3869.22	3873.70	3873.58	3876.52	3864.06	3877.21	3878.58	3871.60	3879.30	3879.84	nm	3880.00	3826.99	3880.00	3869.75
MW-3S	3907.16	3883.71	3881.84	3881.78	3881.46	3881.46	3881.82	3882.24	3882.00	3881.98	3881.84	3881.94	3882.20	nm	3881.81	3881.46	3883.71	3882.01
MW-4	3902.07	3893.37	3891.42	3891.09	3890.69	3891.03	3891.78	3892.69	3892.46	3892.49	3892.23	3892.57	3892.91	nm	3892.26	3890.69	3893.37	3892.08
MW-5	3910.54	3902.01	3900.18	3900.06	3899.57	3899.13	3900.59	3900.70	3900.40	3900.39	3899.90	3900.97	3900.86	nm	3900.10	3899.13	3902.01	3900.37
B2	4305.68	4282.54	4282.53	4282.50	4282.46	4282.58	4282.41	nm	4282.44	4282.39	nm	4282.27	nm	4282.53	nm	4282.27	4282.58	4282.47
B3	4280.93	4264.53	4264.68	4264.75	4264.81	4264.86	4264.78	nm	4264.45	4264.29	nm	4263.80	nm	4263.73	nm	4263.73	4264.86	4264.47
B4	4353.46	4332.44	4332.18	4331.96	4331.86	4331.81	4331.74	nm	nm	4331.57	nm	4331.39	nm	4331.64	nm	4331.39	4332.44	4331.84
B6	4291.39	4266.16	4266.13	4266.08	4266.01	4266.08	4265.91	nm	4265.78	4265.62	nm	4265.23	nm	4265.23	nm	4265.23	4266.16	4265.82

nm - not measured
MP - Measuring Point
Monitoring locations shown on Figure 2-1.



Note: Includes manual measurements only; continuous (transducer) hydrographs included in Appendix D.

FIGURE 3-1. GROUNDWATER LEVEL HYDROGRAPHS FOR MONITORING WELLS (TOP) AND PIEZOMETERS (BOTTOM)

in elevation than the proposed depth of quarrying, meaning all mining will occur well above the regional bedrock groundwater system (Section 3.5). This is consistent with the lack of groundwater encountered during MLR's exploration drilling program, where completion of 25 drill holes within the proposed pit boundaries (including one drill hole completed as piezometer MLR-37, Figure 2-1), reportedly encountered no groundwater down to the ultimate pit depth.

As previously discussed, MLR completed a number of geotechnical boreholes near the proposed plant site with four of the boreholes completed as piezometers B-2, B-3, B-4 and B-6. The boreholes range from 30 to 50 feet in depth and are reportedly completed in Tertiary-age Renova Formation sediments. All four piezometers bottomed in a basal Renova Formation coal seam with perched groundwater on top of the coal seam. The perched groundwater system ranges in thickness from about 10 feet at B-6 to 30 feet at B-2. The potential interaction of this localized perched groundwater with the proposed mine facilities is discussed in Section 3.5.

3.3 GROUNDWATER QUALITY

The six monitoring wells were sampled for water quality in June/July (when first completed), August and October 2014, and April, July and October 2015. The groundwater sampling results are summarized in Table 3-3 with the complete dataset included in Appendix D.

Similar to surface water, groundwater in the Project area is near neutral to alkaline with pH values ranging from 6.97 to 7.94. Water types vary from well to well with groundwater at wells MW-1, MW-3S, MW-4 and MW-5 being a calcium-bicarbonate type, and wells MW-2 and MW-3D calcium-sulfate type. Wells MW-2 and MW-3D also exhibit the highest dissolved constituent concentrations with average TDS concentrations of 574 and 418 mg/L, respectively.

Dissolved metals concentrations are low in site groundwater with beryllium, chromium and silver concentration less than the analytical reporting limits, and cadmium, cobalt, lead, mercury, selenium and thallium near or below reporting limits in all samples. Arsenic, barium, iron, manganese, molybdenum, strontium and uranium are the only trace constituents consistently present above the analytical reporting limits in the baseline groundwater samples (Table 3-3, Appendix D). Comparison of the baseline metals concentrations to the groundwater HHS included in Circular DEQ-7 (MDEQ, 2017) shows that of the more than 850 metals analyses performed on the 42 baseline groundwater samples collected, the only water quality standard exceedances recorded were for arsenic in well MW-2. The arsenic concentration in the October 2014 and April, July and October 2015 water samples from MW-2 exceeded the 0.01 mg/L HHS for arsenic, with the highest value (0.028 mg/L) recorded in July 2015. All other metals analyses from MW-2 and other monitoring wells were less than the applicable HHS. Overall, the baseline dataset shows groundwater quality in the MLR Project area to be of good quality.

TABLE 3-3. BASELINE GROUNDWATER QUALITY DATA SUMMARY - MONTANA LIMESTONE RESOURCES

	MLR MW-1					MLR MW-2					MLR MW-3S					MLR MW-3D					MLR MW-4					MLR MW-5				
Field Parameters	n	# Det	min	max	mean	n	# Det	min	max	mean	n	# Det	min	max	mean	n	# Det	min	max	mean	n	# Det	min	max	mean	n	# Det	min	max	mean
Depth to Water	6	6	24.16	29.52	27.74	6	6	495.50	498.40	496.72	6	6	23.72	25.35	24.85	6	6	27.96	71.07	37.39	6	6	8.21	9.81	9.27	6	6	8.55	10.57	9.81
Dissolved Oxygen	6	6	3.23	5.17	3.85	6	6	0.70	1.60	1.02	6	6	1.59	2.46	1.99	6	6	0.64	2.77	1.50	6	6	2.51	4.62	3.44	6	6	0.4	0.54	0.45
Field pH	6	6	7.07	7.31	7.22	6	6	7.27	7.52	7.40	6	6	6.99	7.20	7.11	6	6	7.20	7.94	7.52	6	6	7.11	7.4	7.31	6	6	6.97	7.18	7.11
Field Specific Conductivity	6	6	500	512	507	6	6	774	896	812	6	6	426	513	485	6	6	560	621	593	6	6	410	449	432	6	6	515	660	571
Water Temperature	6	6	10.4	11.1	10.67	6	6	15.7	15.9	15.8	6	6	7.6	12.3	10.1	6	6	9.6	10.9	10.2	6	6	7.8	12.8	10.7	6	6	3.3	10.9	8.5
Physical Parameters																														
Total Dissolved Solids	6	6	313	342	326	6	6	547	638	574	6	6	271	333	306	6	6	333	474	418	6	6	246	288	272	6	6	344	436	374
Total Suspended Solids	6	6	14	518	130	6	0	<10	<10	NA	6	1	<10	10	NA	6	6	41	972	443	6	1	<10	10	NA	6	0	<10	<20	NA
Commons Ions																														
Alkalinity as CaCO3	6	6	150	170	160	6	6	160	170	168	6	6	160	190	182	6	6	97	220	176	6	6	150	170	160	6	6	180	210	193
Chloride	6	6	2	3	3	6	6	4	7	5	6	6	6	8	7	6	6	1	2	2	6	6	6	10	7	6	6	6	9	8
Fluoride	6	6	1.3	1.4	1.4	6	6	1.4	1.5	1.47	6	6	0.4	0.5	0.4	6	6	1.1	1.9	1.3	6	6	0.4	0.4	0.4	6	6	0.4	0.5	0.5
Sulfate	6	6	82	92	87	6	6	231	300	261	6	6	50	65	55	6	6	150	170	155	6	6	41	53	46	6	6	70	110	89
Nutrients																														
Phosphorus (TOT)	6	6	0.09	0.31	0.184	6	6	0.013	0.05	0.024	6	6	0.039	0.050	0.042	6	6	0.060	1.080	0.564	6	6	0.03	0.051	0.045	6	6	0.035	0.04	0.039
Total Nitrogen as N	6	6	0.22	0.8	0.51	6	5	<0.04	0.70	0.19	6	3	<0.04	0.30	0.10	6	3	<0.04	0.20	0.07	6	3	<0.04	0.4	0.15	6	2	<0.04	0.20	NA
Trace Metals																														
Aluminum (DIS)	6	5	0.0045	1.46	0.328	6	1	<0.009	0.012	NA	6	1	<0.009	0.011	NA	6	6	0.029	3.18	0.810	6	3	<0.009	0.060	0.018	6	1	<0.009	0.049	NA
Antimony (DIS)	6	0	<0.0005	<0.0005	NA	6	6	0.0007	0.0029	0.0015	6	6	0.0008	0.001	0.0009	6	0	<0.0005	<0.0005	NA	6	6	0.0007	0.0009	0.0008	6	6	0.0006	0.0009	0.0007
Arsenic (DIS)	6	6	0.003	0.006	0.0045	6	6	0.006	0.028	0.018	6	6	0.005	0.007	0.006	6	6	0.002	0.004	0.003	6	6	0.006	0.007	0.0065	6	6	0.005	0.007	0.006
Barium (DIS)	6	6	0.037	0.055	0.047	6	6	0.027	0.037	0.032	6	6	0.069	0.085	0.079	6	6	0.036	0.091	0.056	6	6	0.056	0.064	0.0605	6	6	0.067	0.094	0.079
Beryllium (DIS)	6	0	<0.0008	<0.0008	NA	6	0	<0.0008	<0.0008	NA	6	0	<0.0008	<0.0008	NA	6	0	<0.0008	<0.0008	NA	6	0	<0.0008	<0.0008	NA	6	0	<0.0008	<0.0008	NA
Cadmium (DIS)	6	0	<0.00003	<0.00003	NA	6	0	<0.00003	<0.00003	NA	6	0	<0.00003	<0.00003	NA	6	4	<0.00003	0.00006	3.8E-05	6	0	<0.00003	<0.00003	NA	6	6	0.00003	0.00005	0.00004
Calcium (DIS)	6	6	52	62	57	6	6	93	115	99.5	6	6	57	74	66	6	6	69	113	94	6	6	51	62	56	6	6	65	87	75
Chromium (DIS)	6	0	<0.005	<0.01	NA	0	0	<0.005	<0.01	NA	6	0	<0.005	<0.01	NA	6	0	<0.005	<0.01	NA	6	0	<0.005	<0.01	NA	6	0	<0.005	<0.01	NA
Cobalt (DIS)	6	0	<0.005	<0.005	NA	6	5	<0.005	0.011	0.008	6	0	<0.005	<0.005	NA	6	2	<0.005	0.007	NA	6	0	<0.005	<0.005	NA	6	0	<0.005	<0.005	NA
Copper (DIS)	6	0	<0.002	<0.002	NA	6	0	<0.002	<0.002	NA	6	1	<0.002	0.007	NA	6	2	<0.002	0.004	NA	6	0	<0.002	<0.002	NA	6	2	<0.002	0.012	NA
Iron (DIS)	6	4	0.01	0.54	0.127	6	6	0.05	0.75	0.32	6	0	<0.02	<0.02	NA	6	5	<0.02	1.56	0.43	6	1	<0.02	0.04	NA	6	1	<0.02	0.05	NA
Lead (DIS)	6	1	<0.0003	0.0003	NA	6	1	<0.0003	0.0007	NA	6	0	<0.0003	<0.0003	NA	6	2	<0.0003	0.0014	NA	6	0	<0.0003	<0.0003	NA	6	1	<0.0003	0.0009	NA
Magnesium (DIS)	6	6	13	15	14	6	6	31	36	33	6	6	11	15	13	6	6	13	20	17	6	6	11	14	12	6	6	13	17	15
Manganese (DIS)	6	6	0.006	0.046	0.022	6	6	0.097	0.849	0.582	6	2	<0.001	0.003	NA	6	6	0.029	0.279	0.156	6	2	<0.001	0.004	NA	6	2	<0.001	0.005	NA
Mercury (DIS)	6	1	<0.000005	6.20E-06	NA	6	4	<0.000005	1.81E-05	7.13E-06	6	1	<0.000005	5.20E-06	NA	6	1	<0.000005	1.60E-05	NA	6	1	<0.000005	6.30E-06	NA	6	0	<0.000005	<0.000005	NA
Molybdenum (DIS)	6	6	0.005	0.005	0.005	6	6	0.003	0.009	0.005	6	6	0.003	0.003	0.003	6	6	0.005	0.021	0.0097	6	6	0.003	0.004	0.0032	6	6	0.002	0.005	0.004
Nickel (DIS)	6	1	<0.002	0.002	NA	6	6	0.006	0.048	0.039	6	0	<0.002	<0.002	NA	5	6	0.005	0.009	0.007	6	0	<0.002	<0.002	NA	6	0	<0.002	<0.002	NA
Potassium (DIS)	6	6	14	16	15	6	6	3	4	4	6	6	3	4	3.8	6	6	4	4	4	6	6	3	4	3	6	6	3	5	4
Selenium (DIS)	6	6	0.001	0.002	0.0017	6	1	<0.001	0.002	NA	6	0	<0.001	<0.001	NA	6	1	<0.001	0.001	NA	6	0	<0.001	<0.001	NA	6	0	<0.001	<0.001	NA
Silver (DIS)	6	0	<0.0002	<0.0002	NA	6	0	<0.0002	<0.0002	NA	6	0	<0.0002	<0.0002	NA	6	0	<0.0002	<0.0002	NA	6	0	<0.0002	<0.0002	NA	6	0	<0.0002	<0.0002	NA
Sodium (DIS)	6	6	17	24	21	6	6	16	29	20	6	6	12	16	14	6	6	8	10	9	6	6	12	13	12.8	6	6	16	20	18
Strontium (DIS)	6	6	2.00	2.29	2.14	6	6	0.89	0.91	0.90	6	6	0.27	0.33	0.30	6	6	0.80	1.26	1.08	6	6	0.25	0.28	0.26	6	6	0.34	0.46	0.39
Thallium (DIS)	6	0	<0.0002	<0.0002	NA	6	2	<0.0002	0.0004	NA	6	0	<0.0002	<0.0002	NA	6	0	<0.0002	<0.0002	NA	6	0	<0.002	<0.002	NA	6	0	<0.0002	<0.0002	NA
Uranium (DIS)	6	6	0.0016	0.0022	0.0018	6	6	0.0016	0.0022	0.0017	6	6	0.0041	0.0047	0.0044	6	6	0.0019	0.0045	0.0034	6	6	0.0047	0.0057	0.0052	6	6	0.0044	0.0072	0.0055
Zinc (DIS)	6	1	<0.008	0.01	NA	6	4	<0.008	0.034	0.019	6	0	<0.008	<0.008	NA	6	3	<0.008	0.027	0.013	6	0	<0.008	<0.008	NA	6	4	<0.008	0.011	0.008

N - Number of samples
#Det - Number of results greater than Project Required Detection Limit
Below detection values replaced with 1/2 the PRDL for calculation of average concentrations.
NA - Average not calculated where fewer than 50% of results are greater than PRDL.
Duplicate samples not included in stats.
Monitoring site locations shown on Figure 2-1.

3.4 AQUIFER TESTING

Preliminary aquifer testing was conducted on the MLR monitoring wells in conjunction with the groundwater sampling and well purging. Preliminary pumping tests were performed on each well with initial water displacement measured and the rate of equilibration monitored. The pump test data were analyzed by the empirical method described in Driscoll (1986).

Preliminary hydraulic conductivity values (a measure of an aquifer's ability to transmit water), are listed in Table 3-4. As shown in the table, the hydraulic conductivity values are all relatively low with bedrock wells MW-1, MW-2 and MW-3D one foot/day or less. Hydraulic conductivities in unconsolidated sediments range from about 50 feet/day at MW-3S (alluvium/colluvium), to about 200 feet/ day at wells MW-4 and MW-5, completed in the coarse gravel/cobble CFR alluvial aquifer.

The preliminary aquifer testing results presented in Table 3-4 represent initial estimates of aquifer properties at the MLR site. The low hydraulic conductivity values obtained for bedrock wells MW-1, MW and MW-3D are consistent with the low groundwater yields noted during drilling and groundwater sampling. The higher values obtained for wells MW-3S, and MW-4 and MW-5 are also consistent with observed yields for these wells and with values typical of alluvial aquifers with varying fine sediment content. Therefore, the preliminary hydraulic conductivity values are considered representative of site conditions for baseline monitoring purposes.

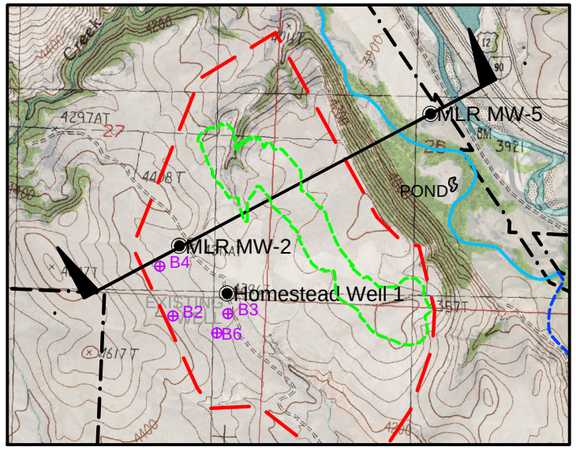
TABLE 3-4. AQUIFER TESTING RESULTS FOR MLR MONITORING WELLS

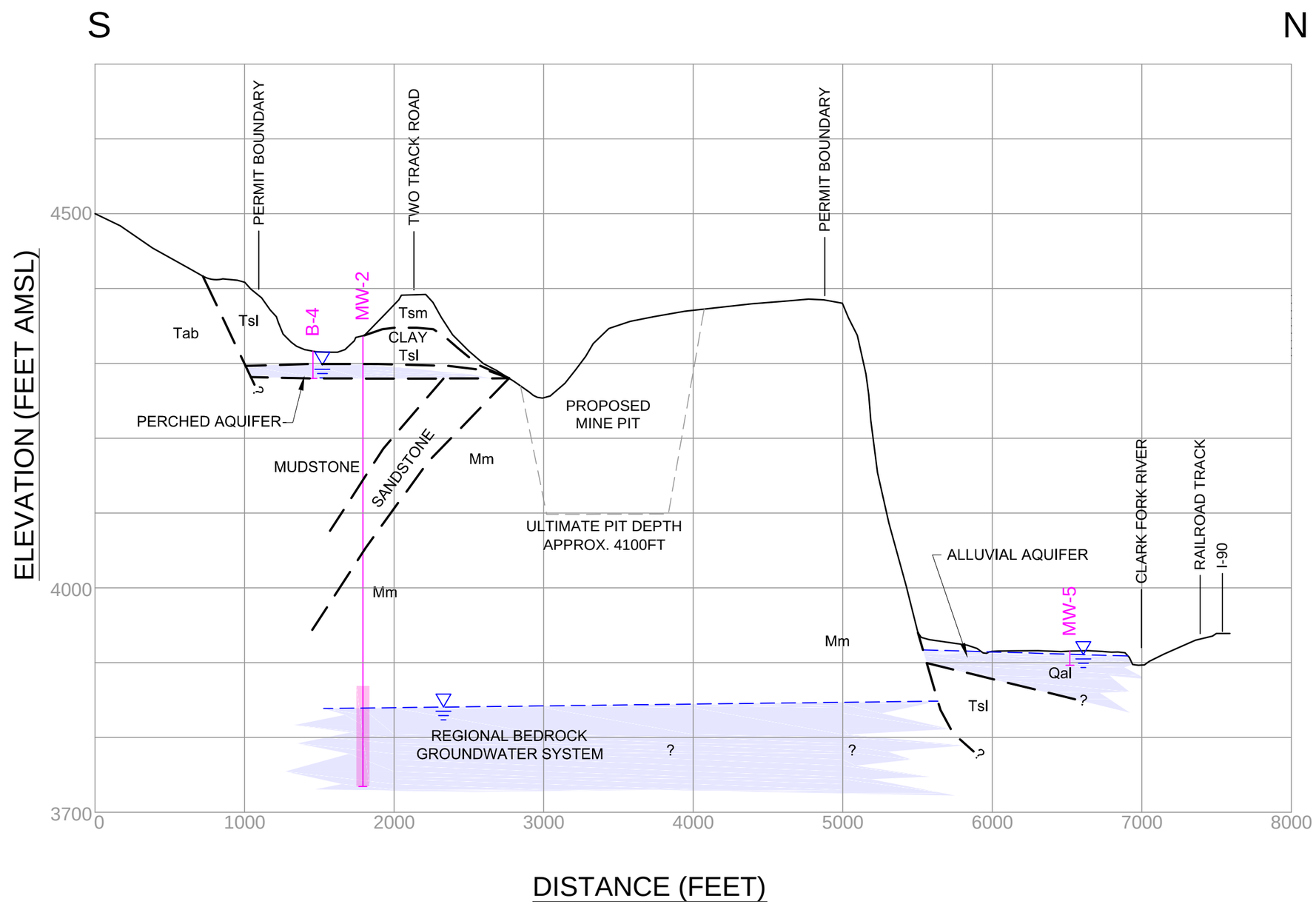
Well	Geologic Unit	Well Screen Interval feet bgs	Hydraulic Conductivity	
			feet/day	cm/sec
MLR MW-1	Maroon Mudstone	95-125	0.1	$4.2*10^{-5}$
MLR MW-2	Madison Limestone	480-600	1.0	$3.4*10^{-4}$
MLR MW-3S	Alluvium/Colluvium	20.5-30.5	50	$1.8*10^{-2}$
MLR MW-3D	Gray-Green Mudstone	58-98	0.5	$1.7*10^{-5}$
MLR MW-4	CFR Alluvium	8-18	200	$7.0*10^{-2}$
MLR MW-5	CFR Alluvium	7.5-17.5	200	$7.0*10^{-2}$

bgs – below ground surface
CFR – Clark Fork River

3.5 GROUNDWATER OCCURRENCE AND IMPLICATIONS FOR MINING

Figure 3-2 includes a generalized cross section of hydrogeologic conditions at the MLR site. The cross section runs from well MW-2 on the southwest, to the Clark Fork River on the northeast. Important features on the section include the deep, presumably regional bedrock groundwater system tapped by well MW-2, the alluvial groundwater system beneath the CFR floodplain, and the shallow perched groundwater system within the Renova Formation southwest of the proposed mine. Also shown are relevant geologic features based on information provided in Appendix A-6 of the MLR operating permit application and other published sources (i.e., Berg, 2005).





GEOLOGY KEY

Qal	QUARTERNARY ALLUVIUM
Tsm	SIXMILE CREEK FORMATION
Tsl	RENOVA FORMATION
Tab	TERTIARY VOLCANICS
Mm	MADISON LIMESTONE

MONTANA LIMESTONE RESOURCES PROJECT	GENERALIZED HYDROGEOLOGIC CROSS SECTION	FIGURE 3-2

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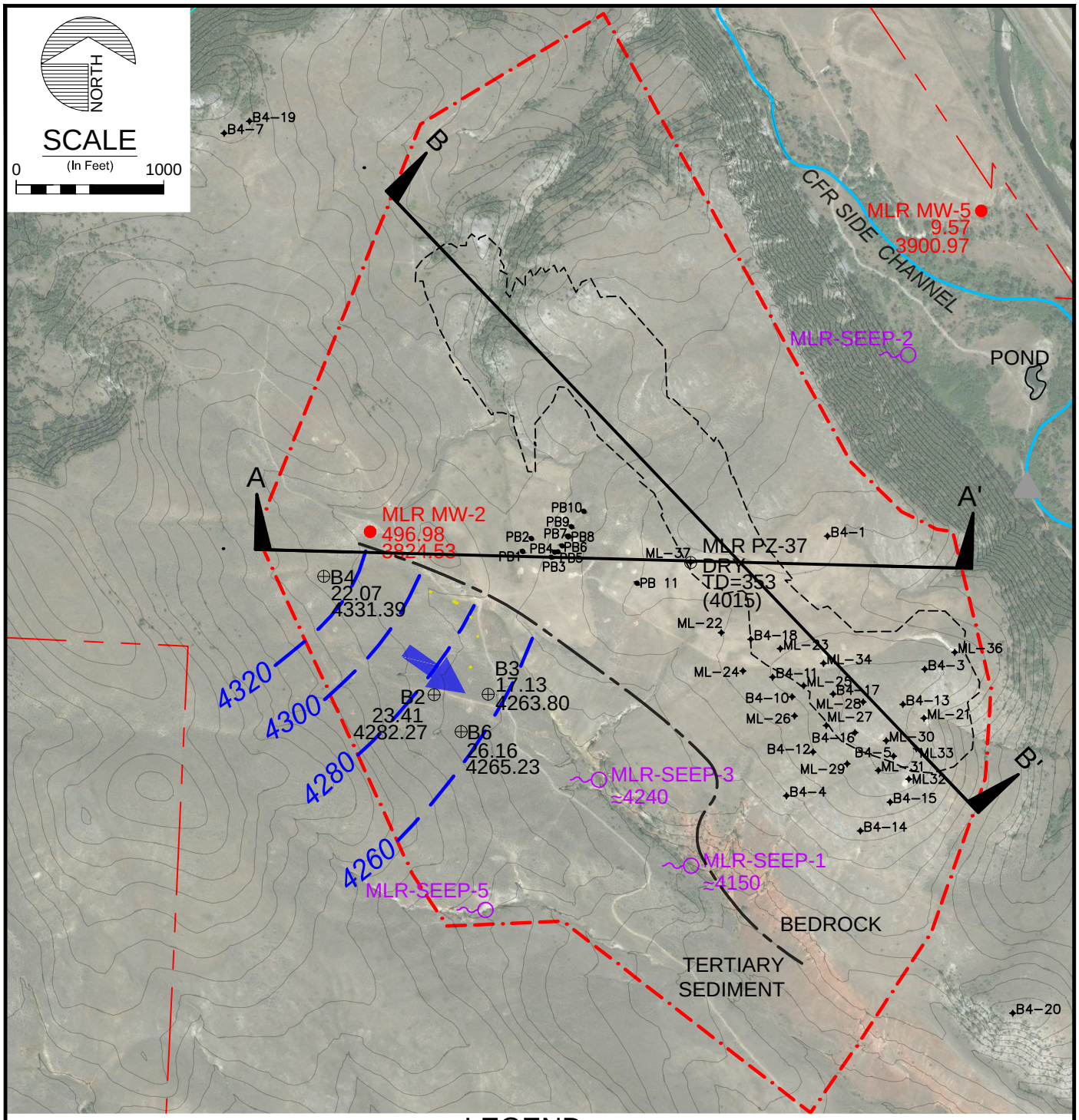
As noted above, the differing groundwater elevations, hydrographs and general chemistry between the various groundwater systems suggests the systems may have limited interaction. The degree of interaction between various hydrostratigraphic units is important not only for establishing baseline hydrologic conditions in the Project area, but also in evaluating potential interactions between the groundwater systems and proposed mine facilities, and in planning and development of a mine water supply. As shown on Figure 3-2, the shallow perched aquifer within the Renova Formation and the bedrock groundwater system tapped by well MW-2 clearly are not interconnected based on the more than 400 feet of unsaturated mudstone, sandstone and limestone separating the two. On the north side of the Project area, the potential connection between the bedrock aquifer and alluvial aquifer is less clear. Based on the stratigraphy at well MW-3D (about 200 feet northwest of the Figure 3-2 cross section), the highly permeable alluvium is underlain at about 30 feet by a gray mudstone. Based on typical valley fill sequences in western Montana, the mudstone may be Renova Formation but could also be Cretaceous or Jurassic units. Either way, the mudstone may limit interaction between the bedrock aquifer and the alluvial aquifer, and therefore the Clark Fork River, although additional information would be required along the south edge of the floodplain for confirmation.

Of primary interest is the potential interaction of groundwater resources with the proposed mine infrastructure, specifically the mine pit. As shown on Figure 3-2, the mine pit will reach a maximum depth of about 300 feet or minimum elevation of 4100 feet amsl. This means the pit bottom will be about 200 feet or more above the bedrock groundwater and alluvial groundwater systems. This is consistent with exploration drilling results reported by MLR where groundwater was not encountered in any of the approximately 30 exploration drill holes completed to the ultimate pit depth throughout the proposed pit area. The lack of groundwater above the proposed depth of mining is also confirmed by piezometer MLR-37, completed to a depth of 350 feet (4018 feet amsl) in one of the exploration boreholes, and which has been dry since completion (see Figures 2-1 and 3-3). The significant depth to bedrock groundwater is also confirmed by the lack of flow in lower Tigh Creek, where the limestone creek bed (approximate elevation 3920 feet amsl) contains flow only in response to high intensity runoff events. Based on this information, development of the mine pit is not expected to intersect the bedrock or alluvial groundwater systems.

Also of interest is the potential for pit development to intersect the localized shallow perched aquifer within the Renova Formation southwest of the proposed pit. Although groundwater elevations in the perched aquifer exceed 4200 feet (higher than the proposed pit bottom), drainage into the pit is not expected based on the perched aquifer characteristics and configuration of the proposed pit. Figure 3-3 shows the January 6, 2015 perched aquifer potentiometric surface (as noted in Section 3.2, the perched aquifer water levels vary about one foot or less seasonally). The potentiometric surface shows a steep southeastward slope to the water table with an average hydraulic gradient of 0.048 ft/ft. This indicates a southeasterly flow direction with the perched groundwater daylighting in a deeply incised drainage and expressed as MLR-SEEP 1 and SEEP-3 (Figure 3-3). Also of importance are geologic conditions between the perched system and proposed pit. As shown on Figures 3-3 and 3-4, the saturated zone within the Tertiary sediments pinches out more than 1000 feet southwest of the proposed pit, with the area between the perched system and proposed pit consisting primarily of unsaturated clay, mudstone/siltstone and Madison Limestone. As indicated by piezometer MLR PZ-37 (see Figures 3-3 and 3-4), the 400-foot depth to water at



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MLR MW-2 496.14 4287.28	MONITORING WELL WITH 1/6/15 GROUNDWATER DEPTH AND ELEVATION (IN FEET)
B3 16.15 4217.94	PIEZOMETER WITH 1/6/15 GROUNDWATER DEPTH AND ELEVATION (IN FEET)
B4/ML	EXPLORATION DIAMOND DRILL HOLES
PB1	PLANT SITE GEOTECHNICAL BOREHOLE
	PROPOSED PERMIT BOUNDARY
	APPROXIMATE PERCHED GROUNDWATER BOUNDARY
	POTENTIOMETRIC CONTOUR
	APPROXIMATE PROPOSED PIT LIMITS
	FLOW DIRECTION
A A'	CROSS SECTION TRACE (CROSS SECTIONS SHOWN ON FIGURE 3-4)

MONTANA LIMESTONE RESOURCES PROJECT	**PERCHED GROUNDWATER SYSTEM BOUNDARIES AND POTENTIOMETRIC SURFACE**	FIGURE **3-3**

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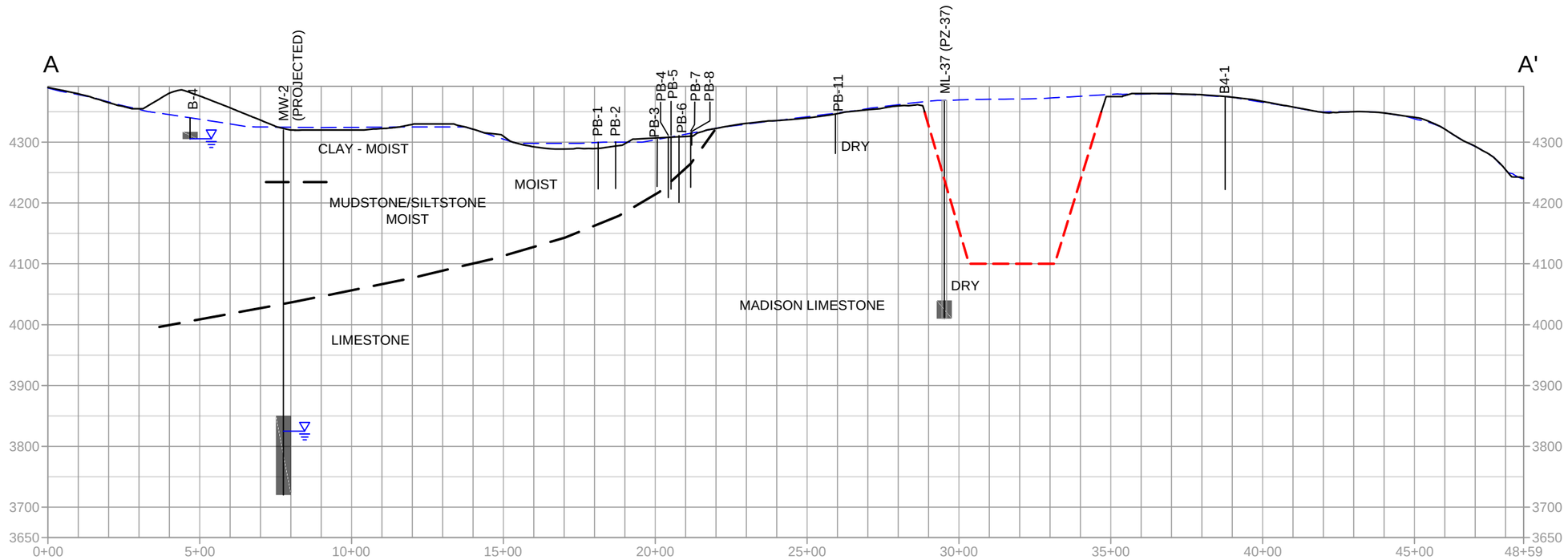

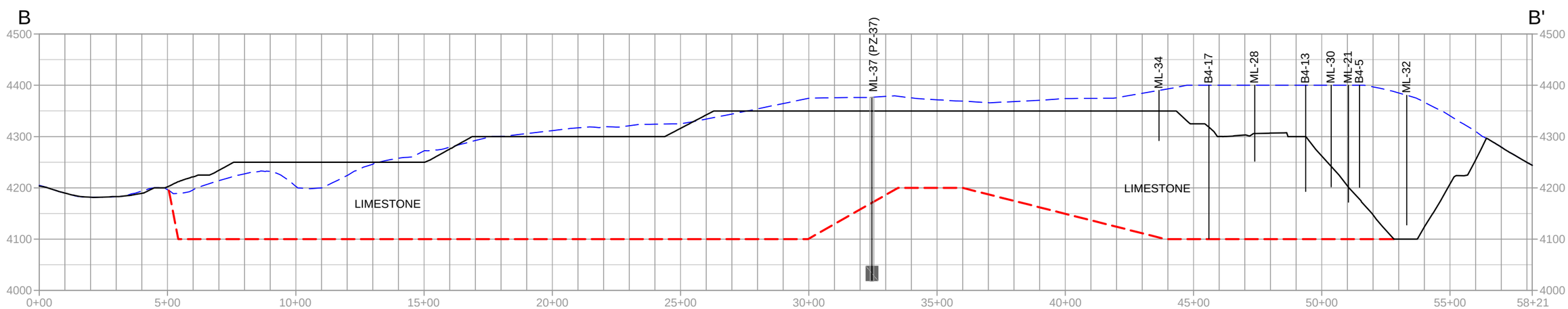

LEGEND

- EXISTING GROUND SURFACE
- PROPOSED RECLAIMED GROUND SURFACE
- ULTIMATE PIT BOTTOM
- STATIC WATER LEVEL
- MW-2 MONITORING WELL
- B-4/PZ-37 PIEZOMETER
- PB GEOTECH BOREHOLE (DRY)
- B4/ML DIAMOND DRILL HOLE (DRY)

NOTE:

CROSS SECTION TRACES SHOWN ON FIGURE 3-3.

MONTANA LIMESTONE RESOURCES PROJECT	HYDROGEOLOGIC CROSS SECTIONS THROUGH PROPOSED QUARRY AREA	FIGURE 3-4

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monitoring well MW-2, and the unsaturated conditions documented between the perched groundwater system and proposed pit area, flow from the perched system to the proposed pit is highly unlikely. Therefore, the perched groundwater system is not expected to adversely affect MLR mining operations or vice versa.

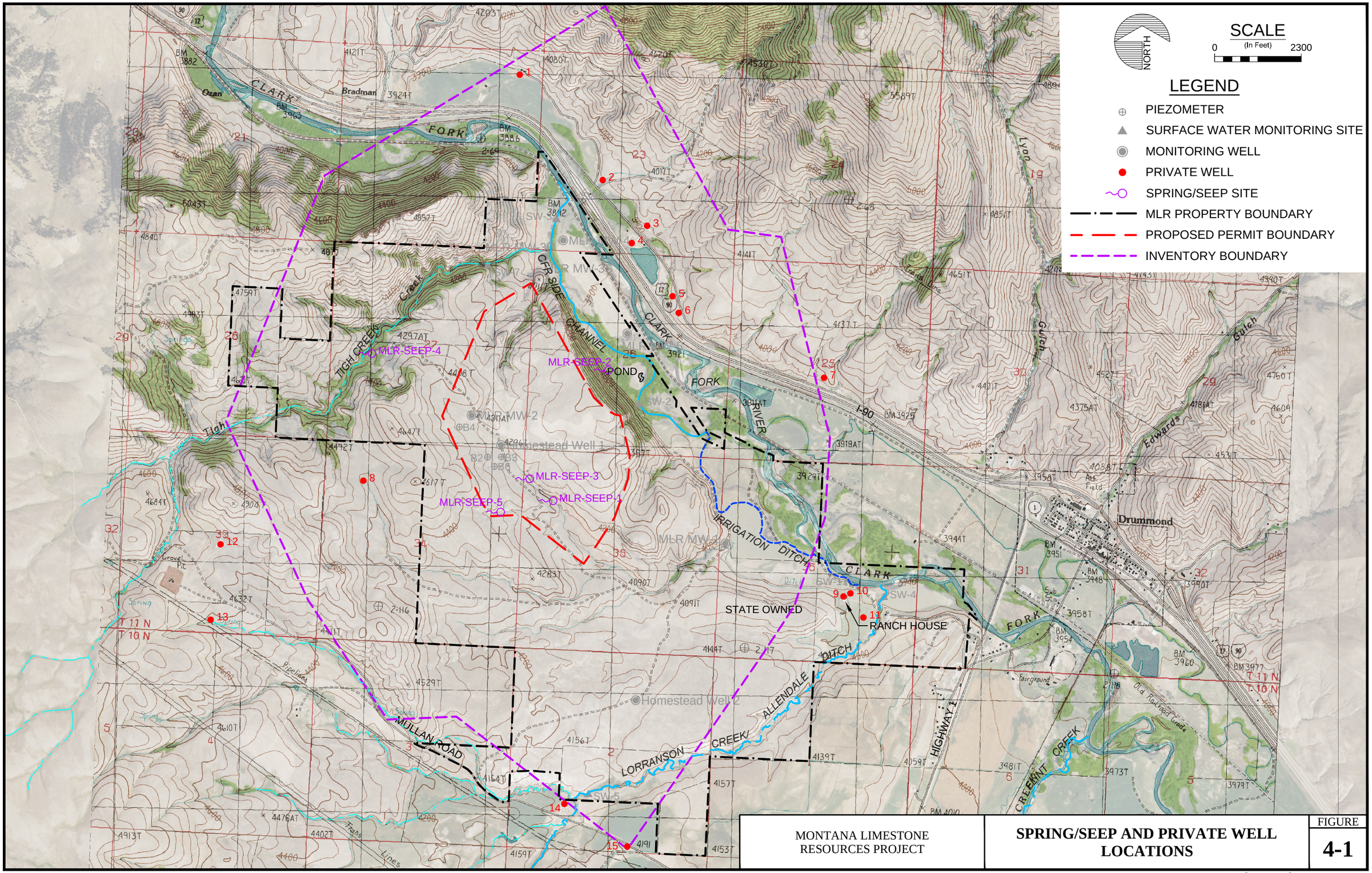
4.0 SPRING/SEEP AND RESIDENTIAL WELL DELINEATION

4.1 SPRING/SEEP SURVEY

A spring and seep inventory was completed in 2013/2014 to further delineate hydrologic features and conditions in the MLR Project area. The spring and seep inventory was conducted in conjunction with the Spring and Fall season surface water sampling events, and included an area extending approximately one mile beyond the proposed mine boundary. Seep/spring water samples were collected in June 2013 and 2014, with all seeps dry or exhibiting insufficient flow to sample during the August and October sampling events. Identified seeps are shown on Figure 4-1 and described in Table 4-1. Spring/seep photos are included in Appendix A.

The most complete spring/seep reconnaissance was conducted on June 30, 2014 with five spring/seep sites identified. SEEP-1 is located in a drainage bottom south of the proposed limestone quarry near the contact between the Amsden and Renova Formations. The water at this site was confined to livestock tracks and other depressions with minimal flow (estimated <0.1 gpm). Site SEEP-3 is a stock tank located uphill of SEEP-1 with inflow from a buried poly-pipe. Similar to SEEP-1, the flow rate from the stock tank was too low to measure but was estimated at <0.1 gpm. Seepage at these two sites is most likely derived from the perched aquifer described above, with the coal seam supporting the perched water exposed in the south drainage wall (the minimal flow at and downhill of SEEP-1 attests to the limited groundwater flux through the perched aquifer). SEEP 2 is located at the base of the steep limestone cliff north of the proposed quarry in a marsh area with no visible flow. SEEP-4 is a stock tank in Tigh Creek drainage fed by a buried poly-pipe. The source of inflow to the pipe and tank was not apparent but is assumed to originate from a buried collection system uphill of the tank in an area of relatively lush vegetation. SEEP-4 is outside of the designated spring/seep inventory area but was included to provide some hydrologic data from the otherwise dry Tigh Creek drainage. SEEP-5 is located in the bottom of a drainage swale south of the proposed mine site. There is no discernible flow at this site with standing water confined to livestock tracks. An old abandoned stock tank near SEEP-5 indicates the area formerly served as a livestock watering source, suggesting wetter conditions in the past. All of the springs/seeps were sampled in June 2014 for the field and laboratory parameters listed in Table 2-2 (dissolved metals). SEEP 1 was also sampled in June 2013 during a preliminary inventory. As noted above, all the spring/seep sites were dry during the August and October 2014 sampling events. The spring and seep sample results are included in Table 4-2.

Water quality varied by seep location with SEEP-1 exhibiting the lowest pH and highest concentrations of most parameters. The relatively low pH (5.40 to 6.66), and high sulfate (2000 to 2200 mg/L) and iron (6.81 to 13.60 mg/L) concentrations are believed to be attributable to the presence of a coal seam within the Removal Formation near the seepage area. pH was highest and constituent concentrations lowest at site SEEP-4 in Tigh Creek drainage, reflecting the limestone terrain in the vicinity of the seep. Water quality at the other seep sites was intermediate to that at SEEP-1 and SEEP-4.



MONTANA LIMESTONE RESOURCES PROJECT	SPRING/SEEP AND PRIVATE WELL LOCATIONS	FIGURE 4-1

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TABLE 4-1. SPRINGS AND SEEPS WITHIN THE MLR PROJECT SURVEY AREA

Site ID	Latitude (°N)	Longitude (°W)	Description
MLR SEEP-1	46.66918	-113.2037	Seepage in drainage bottom near coal seam south of orebody. Very little to no flow.
MLR SEEP-2	46.67887	-113.1985	Marshy area at base of cliff north of orebody. No flow; water confined to livestock tracks.
MLR SEEP-3	46.6707	-113.2063	Stock tank uphill of MLR SEEP-1. Fed by poly-pipe. Tank full but very little to no outflow.
MLR SEEP-4	46.67928	-113.2236	Stock tank in Tigh Creek drainage. Tank full but no visible inflow or outflow; fed by buried poly-pipe.
MLR SEEP-5	46.66818	-113.2092	Wet area in drainage swale south of Project area; old stock tank nearby. No flow; water confined to livestock tracks.

Monitoring locations shown on Figure 4-1.
Coordinates in NAD 83 Datum

4.2 RESIDENTIAL WELL INVENTORY

As required under ARM 17.24.116(4), an inventory of water wells within one mile of the proposed MLR permit boundary was completed through a search of the MBMG Groundwater Information Center (GWIC) database. All wells within the GWIC database are shown on Figure 4-1 and listed in Table 4-3. The well logs, where available, are included in Appendix C.

Eight wells were identified within (or close to) the one mile survey area with seven of the wells located north of the Project area and north of the Clark Fork River, and one located southwest of the Project area. The wells located north of the river are not expected to be influenced by the proposed Project since the river most certainly acts as a hydrologic divide between the wells and proposed mine. The one well located to the southwest (Well #8, Figure 4-1), is located about 0.5 miles from the permit boundary with no well completion information provided in the GWIC database. The MBMG conducted a site visit to the well on September 12, 2001 and measured the well depth at 30 feet and depth to water at 24.63 feet bgs. Based on the location, the well is completed in Tertiary volcanic rock. The well is listed as “unused” in the GWIC database.

Also shown on Figure 4-1 are a few additional domestic wells located just over a mile from the proposed permit boundary. Four of the wells are located south of the Project area along Mullan Road and three to the east. The three wells to the east are all associated with the MLR property ranch house, including one drilled by MLR in 2014 as a potential domestic well (Well #10, Figure 4-1). Drilling at that location advanced 300 feet through Tertiary silts, clays and mudstones and yielded less than 5 gpm.

TABLE 4-2. BASELINE SPRING/SEEP WATER QUALITY DATA - MONTANA LIMESTONE RESOURCES

SITE CODE		MLR-Seep-1	MLR-SEEP-1	MLR-SEEP-1 Dup	MLR-SEEP-2	MLR-SEEP-3	MLR-SEEP-4	MLR-SEEP-5	DI/RINS Blank
SAMPLE CODE		MLR-1306-105	MLR-1406-301	MLR-1406-302	MLR-1406-300	MLR-1406-303	MLR-1406-304	MLR-1406-305	MLR-1406-306
COLLECTION DATE/TIME		6/12/2013 14:45	6/30/2014 14:30	6/30/2014 14:45	6/30/2014 12:20	6/30/2014 15:00	6/30/2014 16:10	6/30/2014 18:00	6/30/2014 18:30
FIELD PARAMETERS	**Units**								
Flow (estimated)	gpm	<0.1	<0.1	<0.1	No Flow	<0.1	No Flow	No Flow	--
Dissolved Oxygen	mg/L	1.60	2.72	2.72	7.9	8.95	10.89	5.24	--
pH	S.U.	6.66	5.40	5.40	7.72	6.75	8.23	7.61	--
Conductivity	µmhos/cm	2988	3087	3087	989	1539	317	694	--
Water Temperature	°C	17.0	17.7	17.7	23.2	15.2	12	25.4	--
PHYSICAL PROPERTIES									
Solids, Total Suspended TSS @ 105 C	mg/L	238	<20	<20	40	<20	<10	120	<10
Solids, Total Dissolved TDS @ 180 C	mg/L	3470	2970	2950	674	1180	172	331	<10
INORGANICS									
Alkalinity, Total as CaCO3	mg/L	45	<4	<4	300	140	140	200	<4
Chloride	mg/L	29	9	9	12	19	4	3	<1
Sulfate	mg/L	2200	2000	2000	200	680	14	68	<1
Fluoride	mg/L	0.6	1	1	0.7	0.6	0.2	0.6	<0.1
NUTRIENTS									
Nitrogen, Total	mg/L	<0.01	0.2	0.2	0.8	0.4	0.4	0.5	<0.1
Phosphorus, Total as P	mg/L	0.048	<0.01	<0.01	0.13	<0.01	0.03	0.11	<0.01
DISSOLVED METALS									
Aluminum	mg/L	0.136	6.8	6.74	<0.009	<0.009	<0.009	0.019	<0.009
Antimony	mg/L	<0.0005	<0.0005	<0.0005	0.0017	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	mg/L	0.002	0.002	0.002	0.066	<0.001	0.001	0.002	<0.001
Barium	mg/L	0.085	0.019	0.018	0.126	0.034	0.069	0.099	<0.003
Beryllium	mg/L	<0.0008	0.0087	0.0083	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Cadmium	mg/L	0.00021	0.00045	0.00047	0.00019	<0.00003	<0.00003	<0.00003	<0.00003
Calcium	mg/L	560	508	509	134	204	35	83	<1
Chromium	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	mg/L	0.03	0.06	0.055	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/L	0.01	0.005	0.005	0.03	<0.002	<0.002	0.002	<0.002
Iron	mg/L	6.81	13.60	13.50	<0.02	0.29	<0.02	<0.02	<0.02
Lead	mg/L	0.0015	0.0008	0.0006	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Magnesium	mg/L	153	124	123	24	52	14	21	<1
Manganese	mg/L	2.69	2.54	2.52	0.005	0.096	<0.005	<0.005	<0.005
Mercury	mg/L	0.000015	<0.000005	<0.000005	0.000009	<0.000005	<0.000005	<0.000005	<0.000005
Molybdenum	mg/L	<0.002	<0.001	<0.001	0.006	0.002	<0.001	0.001	<0.001
Nickel	mg/L	0.025	0.102	0.102	<0.002	<0.002	<0.002	0.003	<0.002
Potassium	mg/L	16	8	8	6	6	3	8	<1
Selenium	mg/L	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	<0.02	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sodium	mg/L	59	45	44	31	61	7	21	<1
Strontium	mg/L	4.44	4.41	4.39	0.72	2.11	0.53	0.71	<0.02
Thallium	mg/L	0.0004	0.0016	0.0015	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium	mg/L	<0.008	0.0012	0.0011	0.0121	0.0007	0.0019	0.0022	<0.0002
Zinc	mg/L	0.038	0.295	0.298	0.01	<0.008	<0.008	<0.008	<0.008
Hardness (calculated)	mg/L	2028	1779	1777	433	723	145	294	

TABLE 4-3. WELLS IDENTIFIED WITHIN ONE MILE OF PROPOSED MINE PERMIT BOUNDARY

		Location				
GWIC ID	**Well Number**	**Township**	**Range**	**Section**	**Depth**	**Use**
Wells Within One Mile Radius						
65891	1	11N	13W	22 NE1/4	86	Domestic
5933	2	11N	13W	23 SW1/4	25	Domestic-Weigh Station
149012	3	11N	13W	23 SE1/4	150	Domestic
160370	4	11N	13W	23 SE1/4	60	Domestic
204657	5	11N	13W	26 NE1/4	130	Domestic
65894	6	11N	13W	26 NE1/4	190	Domestic
65893	7	11N	13W	25 SE1/4	12	Domestic
191288	8	11N	13W	34 NW1/4	30	Unused
Wells Outside One Mile Radius						
255695	9	11N	13W	36 SE1/4	65	Domestic
Pending	10	11N	13W	36 SE1/4	150	Unused
65896	11	11N	13W	36 SE1/4	120	Domestic
160374	12	11N	13W	33 SW1/4	106	Domestic
65895	13	11N	13W	33 SW1/4	110	Unused
63231	14	10N	13W	2 SW1/4	60	Domestic
127478	15	10N	13W	2 SE1/4	105	Domestic

All information from MBMG GWIC Database.
All measurements in feet.
Well Numbers refer to designations on Figure 4-1.
NA – Not Available

In summary, baseline hydrologic monitoring at the MLR site has included seven surface water sampling events in 2013 through 2015, completion of six monitoring wells with six groundwater monitoring events in 2014/2015, and an inventory of springs/seeps and water wells in the area. The resulting water quality dataset and hydrologic information provides important information for use in mine planning and permitting, and for comparison to future operational water quality data and hydrologic conditions.

5.0 REFERENCES

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APPENDIX A

BASELINE MONITORING PHOTO LOG

Surface Water Site SW-1-Upstream	Surface Water Site SW-2-Upstream
Surface Water Site SW-3-Upstream	Surface Water Site SW-4-Downstream

Surface Water Site SW-5-Downstream	Surface Water Site SW-6-Downstream
Surface Water Site SW-7-Upstream	Surface Water Site “POND”

SEEP-1

SEEP-2

SEEP-3

SEEP-5

APPENDIX B

BASELINE SURFACE WATER MONITORING DATA

SITE CODE		MLR-SW-1	MLR-SW-1	MLR SW-1	MLR SW-1	MLR SW-1	MLR-SW-1	MLR-SW-1
SAMPLE CODE		MLR-1306-106	MLR-1308-102	MLR-1406-106	MLR-1408-107	MLR-1410-105	MLR-1507-206	MLR-1511-105
COLLECTION DATE		6/12/2013	8/22/2013	6/26/2014	8/29/2014	10/30/2014	7/23/2015	11/20/2015
FIELD PARAMETERS	**Units**							
Flow	cfs	8.81	3.81	15.95	9.51	2.55	4.69	7.36
Dissolved Oxygen	mg/L	11.92	7.70	8.63	8.99	11.17	9.24	12.08
pH	S.U.	8.66	8.19	8.03	8.29	8.53	8.61	8.68
Conductivity	mmhos/cm	423	582	332	506	451	516	472
Water Temperature	°C	19.2	17.4	16.5	17.9	8.1	20.7	1.2
PHYSICAL PROPERTIES								
Solids, Total Suspended TSS @ 105 C	mg/L	16	<10	41	14	11	<10	11
Solids, Total Dissolved TDS @ 180 C	mg/L	270	392	220	341	291	334	298
INORGANICS								
Alkalinity, Total as CaCO3	mg/L	160	200	120	170	160	160	160
Chloride	mg/L	6	14	3	7	7	7	6
Sulfate	mg/L	69	120	35	77	63	87	71
Fluoride	mg/L	0.4	0.5	0.3	0.4	0.4	0.4	0.5
NUTRIENTS								
Nitrogen, Total	mg/L	<0.01	<0.01	0.41	0.20	0.15	0.22	0.18
Phosphorus, Orthophosphate as P	mg/L	0.027	0.03	0.063	0.06	0.04	0.034	0.022
TOTAL RECOVERABLE METALS								
Aluminum (dissolved)	mg/L	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
Antimony	mg/L	0.0006	0.0005	0.0008	0.0006	<0.0005	0.0006	0.0005
Arsenic	mg/L	0.014	0.013	0.018	0.017	0.010	0.013	0.009
Barium	mg/L	0.057	0.074	0.065	0.068	0.061	0.06	0.065
Beryllium	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Cadmium	mg/L	0.00008	<0.00003	0.00019	0.00006	0.00007	0.00003	0.00007
Calcium	mg/L	55	76	43	64	59	65	54
Chromium	mg/L	<0.01	<0.01	<0.005	<0.005	<0.005	<0.01	<0.01
Cobalt	mg/L	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/L	0.018	0.005	0.043	0.013	0.012	0.006	0.008
Iron	mg/L	0.37	0.13	0.98	0.27	0.29	0.13	0.28
Lead	mg/L	0.0022	0.0005	0.0074	0.0018	0.0018	<0.0003	0.0014
Magnesium	mg/L	13	20	10	16	14	17	14
Manganese	mg/L	0.070	0.023	0.128	0.069	0.064	0.033	0.041
Mercury	mg/L	0.000013	0.000006	0.00015	0.000025	0.000045	0.0000054	0.0000107
Molybdenum	mg/L	0.004	0.006	0.003	0.005	0.003	0.005	0.003
Nickel	mg/L	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Potassium	mg/L	4	6	3	5	4	6	4
Selenium	mg/L	0.0003	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	<0.02	<0.02	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sodium	mg/L	15	24	10	18	16	20	16
Strontium	mg/L	0.39	0.62	0.26	0.42	0.33	0.55	0.32
Thallium	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium	mg/L	<0.002	<0.002	0.0034	0.0055	0.006	0.0058	0.008
Zinc	mg/L	0.021	0.009	0.046	0.014	0.027	<0.002	0.012

SITE CODE		MLR-SW-2	MLR- SW-2	MLR SW-2	MLR SW-2	MLR-SW-2	MLR-SW-2
SAMPLE CODE		MLR-1306-104	MLR-1406-103	MLR-1408-104	MLR-1410-104	MLR-1507-205	MLR-1511-104
COLLECTION DATE/TIME		6/12/2013	6/26/2014	8/29/2014	10/30/2014	7/23/2015	11/20/2015
FIELD PARAMETERS	**Units**						
Flow (cfs)	cfs	1.22	4.25	1.68	0.55	1.35	4.27
Dissolved Oxygen	mg/L	9.11	5.09	7.62	10.19	6.96	11.3
pH	S.U.	8.02	7.56	7.80	8.09	8.21	7.7
Conductivity	mmhos/cm	474	500	502	456	570	455
Water Temperature	°C	19.4	16.2	16.0	7.5	21.4	0.6
PHYSICAL PROPERTIES							
Solids, Total Suspended TSS @ 105 C	mg/L	<10	<10	<10	<10	12	<10
Solids, Total Dissolved TDS @ 180 C	mg/L	305	351	330	292	376	286
INORGANICS							
Alkalinity, Total as CaCO3	mg/L	170	170	170	160	160	150
Chloride	mg/L	8	6	7	7	10	6
Sulfate	mg/L	85	83	69	61	111	68
Fluoride	mg/L	0.4	0.4	0.4	0.4	0.5	0.5
NUTRIENTS							
Nitrogen, Total	mg/L	<0.01	0.40	0.50	0.17	0.33	0.12
Phosphorus, Total as P	mg/L	0.053	0.058	0.060	0.030	0.059	0.018
TOTAL RECOVERABLE METALS							
Aluminum (dissolved)	mg/L	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
Antimony	mg/L	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	mg/L	0.011	0.011	0.015	0.010	0.014	0.008
Barium	mg/L	0.068	0.062	0.066	0.058	0.071	0.06
Beryllium	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Cadmium	mg/L	0.00004	0.00007	0.00003	0.00005	0.00007	0.00005
Calcium	mg/L	60	55	62	59	68	52
Chromium	mg/L	<0.01	<0.005	<0.005	<0.005	<0.01	<0.01
Cobalt	mg/L	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/L	0.008	0.009	0.007	0.006	0.012	0.007
Iron	mg/L	0.09	0.09	0.04	0.09	0.33	0.16
Lead	mg/L	0.0005	0.0004	<0.0003	0.0005	0.0019	0.001
Magnesium	mg/L	14	12	15	14	18	14
Manganese	mg/L	0.021	0.031	0.009	0.012	0.046	0.018
Mercury	mg/L	<0.000005	0.000005	<0.000005	<0.000005	0.00002	0.000005
Molybdenum	mg/L	0.004	0.003	0.004	0.003	0.005	0.003
Nickel	mg/L	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Potassium	mg/L	5	4	5	4	7	4
Selenium	mg/L	0.0002	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	<0.02	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sodium	mg/L	17	14	17	15	23	15
Strontium	mg/L	0.42	0.39	0.41	0.34	0.64	0.29
Thallium	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium	mg/L	<0.002	0.0033	0.0047	0.0058	0.0048	0.0078
Zinc	mg/L	0.012	0.013	0.008	0.014	0.02	0.014

SITE CODE		MLR-SW-3	MLR SW-3	MLR SW-3	MLR SW-3	MLR-SW-3	MLR-SW-3
SAMPLE CODE		MLR-1306-101	MLR-1406-101	MLR-1408-101	MLR-1410-102	MLR-1507-201	MLR-1511-101
COLLECTION DATE/TIME		6/12/2013	6/26/2014	8/29/2014	10/30/2014	7/23/2015	11/20/2015
FIELD PARAMETERS	**Units**						
Flow (cfs)	cfs	0.51	1.13	0.15	0.07	0.38	0.98
Dissolved Oxygen	mg/L	8.63	5.73	7.41	10.85	8.49	11.86
pH	S.U.	8.20	7.83	8.00	8.17	8.61	8.49
Conductivity	mmhos/cm	465	421	495	460	489	470
Water Temperature	°C	17.7	18.2	15.6	6.9	20	0.4
PHYSICAL PROPERTIES							
Solids, Total Suspended TSS @ 105 C	mg/L	41	<10	<10	<10	<10	<10
Solids, Total Dissolved TDS @ 180 C	mg/L	297	273	323	302	320	286
INORGANICS							
Alkalinity, Total as CaCO3	mg/L	170	150	170	160	140	160
Chloride	mg/L	8	5	7	8	8	6
Sulfate	mg/L	82	54	73	64	91	70
Fluoride	mg/L	0.4	0.4	0.4	0.4	0.4	0.5
NUTRIENTS							
Nitrogen, Total	mg/L	<0.01	0.41	0.40	0.07	0.38	0.11
Phosphorus, Total as P	mg/L	0.055	0.035	0.030	0.040	0.033	0.022
TOTAL RECOVERABLE METALS							
Aluminum (dissolved)	mg/L	0.011	<0.009	<0.009	<0.009	<0.009	<0.009
Antimony	mg/L	0.0005	<0.0005	0.0006	<0.0005	0.0006	<0.0005
Arsenic	mg/L	0.014	0.013	0.015	0.002	0.014	0.009
Barium	mg/L	0.077	0.058	0.069	0.051	0.059	0.061
Beryllium	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Cadmium	mg/L	0.00011	0.00011	0.00007	<0.00003	0.00004	0.0001
Calcium	mg/L	58	53	61	48	55	56
Chromium	mg/L	<0.01	<0.005	<0.005	<0.005	<0.01	<0.01
Cobalt	mg/L	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/L	0.018	0.012	0.009	<0.002	0.008	0.007
Iron	mg/L	0.37	0.07	0.05	<0.02	0.06	0.23
Lead	mg/L	0.0014	0.0004	0.0003	<0.0003	0.0003	0.0008
Magnesium	mg/L	14	12	16	11	17	14
Manganese	mg/L	0.028	0.010	0.005	0.213	0.008	0.014
<	mg/L	0.0000071	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Molybdenum	mg/L	0.005	0.004	0.005	0.003	0.005	0.003
Nickel	mg/L	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Potassium	mg/L	5	4	5	3	6	4
Selenium	mg/L	<0.0002	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	<0.02	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sodium	mg/L	17	14	18	14	21	16
Strontium	mg/L	0.43	0.35	0.42	0.30	0.5	0.28
Thallium	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium	mg/L	<0.008	0.0031	0.0048	0.0027	0.0043	0.0075
Zinc	mg/L	0.025	0.015	0.009	<0.008	<0.008	0.016

SITE CODE		MLR-SW-4	MLR-SW-4	MLR-SW-4 DUP	MLR SW-4	MLR SW-4	MLR SW-4	SW-4 DUP	MLR-SW-4	MLR-SW-4
SAMPLE CODE		MLR-1306-107	MLR-1308-103	MLR-1308-104	MLR-1406-107	MLR-1408-105	MLR-1410-106	MLR-1410-107	MLR-1507-207	MLR-1511-106
COLLECTION DATE/TIME		6/13/2013	8/22/2013	8/22/2013	6/26/2014	8/29/2014	10/30/2014	10/30/2014	7/23/2015	11/20/2015
FIELD PARAMETERS	**Units**									
Flow (cfs)	cfs	3.72	2.67	NA	5.82	6.98	3.10	--	4.45	2.52
Dissolved Oxygen	mg/L	11.00	7.69	7.69	9.12	9.41	10.64	--	9.72	11.73
pH	S.U.	8.31	8.10	8.10	7.97	8.10	8.41	--	8.32	8.54
Conductivity	mmhos/cm	1052	1106	1106	1106	1102	1136	--	1057	1224
Water Temperature	°C	16.1	14.7	15.7	15.5	14.8	10.0	--	16.4	2.2
PHYSICAL PROPERTIES										
Solids, Total Suspended TSS @ 105 C	mg/L	50	28	32	30	20	11	13	29	88
Solids, Total Dissolved TDS @ 180 C	mg/L	757	828	813	812	808	839	839	765	855
INORGANICS										
Alkalinity, Total as CaCO3	mg/L	240	250	260	250	260	250	250	250	260
Chloride	mg/L	22	31	31	20	22	30	30	19	32
Sulfate	mg/L	360	370	370	330	320	350	350	306	371
Fluoride	mg/L	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6
NUTRIENTS										
Nitrogen, Total	mg/L	<0.01	0.01	0.02	0.30	0.10	0.14	0.15	0.28	0.22
Phosphorus, Total as P	mg/L	0.053	0.071	0.072	0.095	0.090	0.090	0.080	0.128	0.132
TOTAL RECOVERABLE METALS										
Aluminum (dissolved)	mg/L	<0.0095	0.011	0.017	<0.0095	<0.0095	<0.0095	<0.009	0.06	<0.0095
Antimony	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	mg/L	0.017	0.018	0.018	0.018	0.019	0.017	0.017	0.018	0.018
Barium	mg/L	0.062	0.058	0.057	0.055	0.055	0.053	0.052	0.065	0.078
Beryllium	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Cadmium	mg/L	0.00004	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	0.00003	0.00006
Calcium	mg/L	125	147	146	134	130	143	141	138	136
Chromium	mg/L	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01
Cobalt	mg/L	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/L	<0.002	0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003
Iron	mg/L	0.93	0.83	0.82	0.63	0.39	0.35	0.39	0.83	2.13
Lead	mg/L	0.0007	0.0006	0.0006	0.0006	<0.0003	<0.0003	<0.0003	0.0005	0.0013
Magnesium	mg/L	35	40	40	36	36	36	35	34	36
Manganese	mg/L	0.051	0.051	0.05	0.050	0.040	0.034	0.036	0.057	0.100
Mercury	mg/L	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	0.000005	0.000006
Molybdenum	mg/L	0.021	0.017	0.016	0.020	0.018	0.012	0.012	0.013	0.010
Nickel	mg/L	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Potassium	mg/L	18	18	18	18	17	17	17	16	18
Selenium	mg/L	0.0011	0.0019	0.0019	0.001	0.002	0.003	0.003	0.002	0.002
Silver	mg/L	<0.02	<0.02	<0.02	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sodium	mg/L	49	51	51	50	54	53	52	46	59
Strontium	mg/L	1.62	1.82	1.79	1.67	1.66	1.81	1.79	1.66	1.82
Thallium	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium	mg/L	0.010	0.011	0.011	0.010	0.010	0.010	0.010	0.008	0.012
Zinc	mg/L	0.004	0.004	0.004	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008

SITE CODE		MLR-SW-5	MLR-SW-5	MLR SW-5	MLR SW-5	MLR SW-5	MLR-SW-5	MLR-SW-5	MLR-SW-5 - DUP
SAMPLE CODE		MLR-1306-108	MLR-1308-105	MLR-1406-105	MLR-1408-108	MLR-1410-100	MLR-1507-208	MLR-1511-107	MLR-1511-108
COLLECTION DATE		6/12/2013	8/22/2013	6/26/2014	8/29/2014	10/30/2014	7/23/2015	11/20/2015	11/20/2015
FIELD PARAMETERS	**Units**								
Flow (cfs)	cfs	0.10	1.60	2.29	2.1	1.80	4.34	0.81	--
Dissolved Oxygen	mg/L	9.47	8.42	10.23	10.55	12.29	8.08	11.98	--
pH	S.U.	8.27	8.21	8.19	8.08	8.16	8.03	8.50	--
Conductivity	mmhos/cm	1237	1111	1109	1132	1140	820	1212	--
Water Temperature	°C	17.8	15.9	15.0	15.4	8.8	16	3.7	--
PHYSICAL PROPERTIES									
Solids, Total Suspended TSS @ 105 C	mg/L	12	14	17	<10	<10	24	19	14
Solids, Total Dissolved TDS @ 180 C	mg/L	964	815	813	824	841	737	857	878
INORGANICS									
Alkalinity, Total as CaCO3	mg/L	270	270	240	250	250	240	250	250
Chloride	mg/L	9	42	42	41	39	26	37	37
Sulfate	mg/L	480	340	300	310	330	275	365	357
Fluoride	mg/L	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
NUTRIENTS									
Nitrogen, Total	mg/L	<0.01	<0.01	0.37	0.20	0.28	0.35	0.19	0.21
Phosphorus, Total as P	mg/L	0.066	0.080	0.154	0.090	0.090	0.166	0.098	0.091
TOTAL RECOVERABLE METALS									
Aluminum (dissolved)	mg/L	<0.009	0.017	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
Antimony	mg/L	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	mg/L	0.003	0.011	0.013	0.012	0.012	0.011	0.013	0.013
Barium	mg/L	0.087	0.061	0.066	0.061	0.056	0.082	0.056	0.055
Beryllium	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Cadmium	mg/L	<0.00003	<0.00003	0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
Calcium	mg/L	195	153	141	140	148	129	142	150
Chromium	mg/L	<0.01	<0.01	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01
Cobalt	mg/L	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron	mg/L	0.23	0.34	0.48	0.22	0.23	0.65	0.57	0.46
Lead	mg/L	<0.0003	<0.0003	0.0003	<0.0003	<0.0003	0.0005	0.0003	<0.0003
Magnesium	mg/L	27	36	34	36	35	30	35	36
Manganese	mg/L	0.142	0.090	0.100	0.101	0.103	0.128	0.162	0.158
Mercury	mg/L	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	0.0000051	<0.000005	<0.000005
Molybdenum	mg/L	<0.002	0.007	0.006	0.007	0.007	0.005	0.007	0.007
Nickel	mg/L	0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Potassium	mg/L	4	15	15	15	15	13	16	16
Selenium	mg/L	<0.0002	0.0026	0.0030	0.0030	0.0030	0.0020	0.0020	0.0020
Silver	mg/L	<0.02	<0.02	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sodium	mg/L	54	48	45	47	49	44	55	54
Strontium	mg/L	2.22	1.56	1.51	1.51	1.62	1.5	1.54	1.55
Thallium	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium	mg/L	<0.008	0.011	0.010	0.009	0.009	0.007	0.009	0.010
Zinc	mg/L	0.002	0.003	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008

SITE CODE		MLR-SW-6	MLR-SW-6	MLR SW-6	MLR SW-6	MLR SW-6	MLR-SW-6	MLR-SW-6
SAMPLE CODE		MLR-1306-100	MLR-1308-100	MLR-1406-100	MLR-1408-100	MLR-1410-101	MLR-1507-200	MLR-1511-100
COLLECTION DATE		6/12/2013	8/22/2013	6/26/2014	8/29/2014	10/30/2014	7/23/2015	11/20/2015
FIELD PARAMETERS	**Units**							
Flow (cfs)	cfs	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
Dissolved Oxygen	mg/L	10.87	6.60	8.60	9.05	11.65	9.92	13.60
pH	S.U.	8.26	8.09	7.90	7.97	8.43	8.45	8.38
Conductivity	mmhos/cm	362	448	298	426	422	387	446
Water Temperature	°C	15.4	15.6	14.9	15.3	7.6	19.4	0.7
PHYSICAL PROPERTIES								
Solids, Total Suspended TSS @ 105 C	mg/L	18	<10	58	15	11	<10	<10
Solids, Total Dissolved TDS @ 180 C	mg/L	224	291	212	275	269	240	270
INORGANICS								
Alkalinity, Total as CaCO3	mg/L	150	180	120	160	160	140	160
Chloride	mg/L	6	11	3	5	6	6	6
Sulfate	mg/L	47	71	23	46	51	49	62
Fluoride	mg/L	0.3	0.5	0.3	0.4	0.4	0.4	0.5
NUTRIENTS								
Nitrogen, Total	mg/L	<0.01	<0.01	0.50	0.30	0.09	0.32	0.17
Phosphorus, Total as P	mg/L	0.025	0.018	0.074	0.040	0.030	0.027	0.023
TOTAL RECOVERABLE METALS								
Aluminum (dissolved)	mg/L	<0.009	0.026	0.011	<0.009	<0.009	<0.009	<0.009
Antimony	mg/L	0.0008	0.0006	0.0009	0.0007	<0.0005	<0.0005	0.0005
Arsenic	mg/L	0.013	0.012	0.019	0.017	0.010	0.011	0.009
Barium	mg/L	0.058	0.081	0.065	0.073	0.064	0.056	0.064
Beryllium	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Cadmium	mg/L	0.00011	0.00004	0.00026	0.00011	0.00009	0.00003	0.0001
Calcium	mg/L	48	57	39	56	56	47	54
Chromium	mg/L	<0.01	<0.01	<0.005	<0.005	<0.005	<0.01	<0.01
Cobalt	mg/L	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/L	0.021	0.006	0.055	0.016	0.013	0.008	0.010
Iron	mg/L	0.45	0.08	1.20	0.27	0.29	0.04	0.23
Lead	mg/L	0.0025	0.0004	0.0095	0.0022	0.0020	<0.0003	0.0017
Magnesium	mg/L	11	15	9	13	13	13	14
Manganese	mg/L	0.074	0.022	0.154	0.082	0.067	0.035	0.049
Mercury	mg/L	0.000012	0.000006	0.00026	0.000047	0.000015	0.0000068	0.00002
Molybdenum	mg/L	0.003	0.004	0.002	0.003	0.003	0.003	0.003
Nickel	mg/L	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Potassium	mg/L	3	4	2	4	3	4	3
Selenium	mg/L	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	<0.02	<0.02	0.0003	<0.0002	<0.0002	<0.0002	<0.0002
Sodium	mg/L	11	17	9	14	14	15	15
Strontium	mg/L	0.26	0.37	0.20	0.27	0.26	0.31	0.26
Thallium	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium	mg/L	<0.008	<0.008	0.0031	0.0049	0.0059	0.005	0.0077
Zinc	mg/L	0.026	0.007	0.063	0.019	0.020	<0.008	0.015

SITE CODE		POND	POND	POND	POND	POND	POND	POND
SAMPLE CODE		MLR-1306-103	MLR-1308-101	MLR-1406-102	MLR-1408-103	MLR-1410-103	MLR-1507-203	MLR-1511-103
COLLECTION DATE		6/12/2013	8/22/2013	6/26/2014	8/29/2014	10/30/2014	7/23/2015	11/20/2015
FIELD PARAMETERS	**Units**							
Flow (cfs)	cfs	No Flow	No Flow	No Flow	No Flow	No Flow	No Flow	--
Dissolved Oxygen	mg/L	7.54	4.88	5.95	10.81	10.17	6.7	9.14
pH	S.U.	7.95	7.58	7.43	7.65	7.77	7.95	8.13
Conductivity	mmhos/cm	643	694	734	759	742	604	817
Water Temperature	°C	19.0	17.9	16.6	15.6	8.5	20.7	2.6
PHYSICAL PROPERTIES								
Solids, Total Suspended TSS @ 105 C	mg/L	<10	14	<10	<10	<10	<10	<10
Solids, Total Dissolved TDS @ 180 C	mg/L	430	466	489	504	509	403	548
INORGANICS								
Alkalinity, Total as CaCO3	mg/L	210	220	200	210	230	190	230
Chloride	mg/L	11	15	10	11	11	8	13
Sulfate	mg/L	140	170	150	170	150	109	194
Fluoride	mg/L	0.5	0.5	0.5	0.5	0.5	0.6	0.5
NUTRIENTS								
Nitrogen, Total	mg/L	<0.01	<0.01	0.27	0.3	0.09	0.38	0.14
Phosphorus, Total as P	mg/L	0.014	0.008	0.011	0.010	0.040	0.033	0.030
TOTAL RECOVERABLE METALS								
Aluminum (dissolved)	mg/L	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
Antimony	mg/L	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.0005	<0.0005
Arsenic	mg/L	0.005	0.004	0.004	0.004	0.004	0.004	0.005
Barium	mg/L	0.083	0.110	0.085	0.088	0.100	0.085	0.098
Beryllium	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Cadmium	mg/L	0.00004	<0.00003	0.00006	<0.00003	0.00004	0.00003	0.00006
Calcium	mg/L	84	92	92	95	100	74	101
Chromium	mg/L	<0.01	<0.01	<0.005	<0.005	<0.005	<0.01	<0.01
Cobalt	mg/L	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron	mg/L	<0.02	0.06	0.03	<0.02	0.04	0.04	0.04
Lead	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Magnesium	mg/L	19	22	21	23	22	19	25
Manganese	mg/L	0.265	0.198	0.213	0.093	0.422	0.224	0.259
Mercury	mg/L	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Molybdenum	mg/L	0.006	0.007	0.005	0.006	0.005	0.007	0.004
Nickel	mg/L	0.001	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Potassium	mg/L	6	6	5	6	6	6	6
Selenium	mg/L	<0.0002	<0.0002	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	mg/L	<0.02	<0.02	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sodium	mg/L	26	28	26	28	29	25	30
Strontium	mg/L	0.50	0.60	0.57	0.61	0.62	0.5	0.64
Thallium	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium	mg/L	<0.008	<0.008	0.005	0.005	0.005	0.0049	0.0067
Zinc	mg/L	<0.002	<0.002	<0.008	<0.008	<0.008	<0.008	<0.008

MONITORING SITE MLR SW-1 WATER QUALITY EXCEEDANCE SUMMARY

COLLECTION DATE		multipliers					6/12/2013				8/22/2013				6/26/2014				8/29/2014				10/30/2014			
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1306-106	Aquatic	HHS Exc	Aq Exc	MLR-1308-102	Aquatic	HHS Exc	Aq Exc	MLR-1406-106	Aquatic	HHS Exc	Aq Exc	MLR-1408-107	Aquatic	HHS Exc	Aq Exc	MLR-1410-105	Aquatic	HHS Exc	Aq Exc
TOTAL RECOVERABLE METALS																										
Aluminum (dissolved)	mg/L					na	<0.009	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0
Antimony	mg/L					0.0056	0.0006	na	0	0	0.0005	na	0	0	0.0008	na	0	0	0.0006	na	0	0	<0.0005	na	0	0
Arsenic	mg/L					0.01	0.014	0.15	1	0	0.013	0.15	1	0	0.018	0.15	1	0	0.017	0.15	1	0	0.010	0.15	0	0
Barium	mg/L					1.0	0.057	na	0	0	0.074	na	0	0	0.065	na	0	0	0.068	na	0	0	0.061	na	0	0
Beryllium	mg/L					0.004	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	0.00008	0.0004	0	0	<0.00003	0.0006	0	0	0.00019	0.0004	0	0	0.00006	0.0005	0	0	0.00007	0.0005	0	0
Calcium	mg/L					na	55	na	0	0	76	na	0	0	43	na	0	0	64	na	0	0	59	na	0	0
Chromium	mg/L					0.1	<0.01	na	0	0	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Cobalt	mg/L					na	<0.01	na	0	0	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	0.018	0.0162	0	1	0.005	0.0219	0	0	0.043	0.0131	0	0	0.013	0.0187	0	0	0.012	0.0172	0	0
Iron	mg/L					na	0.37	1.0	0	0	0.13	1.0	0	0	0.98	1.0	0	0	0.27	1.0	0	0	0.29	1.0	0	0
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	0.0022	0.0072	0	0	0.0005	0.0114	0	0	0.0074	0.0053	0	1	0.0018	0.0090	0	0	0.0018	0.0079	0	0
Magnesium	mg/L					na	13	na	0	0	20	na	0	0	10	na	0	0	16	na	0	0	14	na	0	0
Manganese	mg/L					na	0.070	na	0	0	0.023	na	0	0	0.128	na	0	0	0.069	na	0	0	0.064	na	0	0
Mercury	mg/L					0.00005	0.000013	0.00091	0	0	0.000006	0.00091	0	0	0.00015	0.00091	0	0	0.000025	0.00091	0	0	0.000045	0.00091	0	0
Molybdenum	mg/L					na	0.004	na	0	0	0.006	na	0	0	0.003	na	0	0	0.005	na	0	0	0.003	na	0	0
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	<0.001	0.0901	0	0	<0.001	0.1217	0	0	<0.002	0.0729	0	0	<0.002	0.1039	0	0	<0.002	0.0957	0	0
Selenium	mg/L					0.05	0.0003	0.005	0	0	0.0005	0.005	0	0	<0.001	0.005	0	0	<0.001	0.005	0	0	<0.001	0.005	0	0
Silver	mg/L	1.72	-6.52			0.1	<0.02	0.0123	0	0	<0.02	0.0227	0	0	0.0002	0.0080	0	0	<0.0002	0.0165	0	0	<0.0002	0.0139	0	0
Strontium	mg/L					4	0.39	na	0	0	0.62	na	0	0	0.26	na	0	0	0.42	na	0	0	0.33	na	0	0
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0
Uranium	mg/L					0.03	<0.008	na	0	0	<0.008	na	0	0	0.0034	na	0	0	0.0055	na	0	0	0.006	na	0	0
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	0.021	0.2072	0	0	0.009	0.2798	0	0	0.046	0.1675	0	0	0.014	0.2388	0	0	0.027	0.2201	0	0
Hardness (calculated)	mg/L						191				272				149				226				205			

COLLECTION DATE		multipliers					7/23/2015				11/20/2015				SW-1 EXCEEDANCE SUMMARY				
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1507-206	Aquatic	HHS Exc	Aq Exc	MLR-1511-105	Aquatic	HHS Exc	Aq Exc	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc
TOTAL RECOVERABLE METALS																			
Aluminum (dissolved)	mg/L					na	<0.009	0.087	0	0	<0.009	0.087	0	0	7	0	0	0	0%
Antimony	mg/L					0.0056	0.0006	na	0	0	0.0005	na	0	0	7	0	0	0	0%
Arsenic	mg/L					0.01	0.013	0.15	1	0	0.009	0.15	0	0	7	5	0	5	71%
Barium	mg/L					1.0	0.06	na	0	0	0.065	na	0	0	7	0	0	0	0%
Beryllium	mg/L					0.004	<0.008	na	0	0	<0.008	na	0	0	7	0	0	0	0%
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	0.00003	0.0005	0	0	0.00007	0.0004	0	0	7	0	0	0	0%
Calcium	mg/L					na	65	na	0	0	54	na	0	0	7	0	0	0	0%
Chromium	mg/L					0.1	<0.01	na	0	0	<0.01	na	0	0	7	0	0	0	0%
Cobalt	mg/L					na	<0.005	na	0	0	<0.005	na	0	0	7	0	0	0	0%
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	0.006	0.0192	0	0	0.008	0.0163	0	0	7	0	1	1	14%
Iron	mg/L					na	0.13	1.0	0	0	0.28	1.0	0	0	7	0	0	0	0%
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	<0.0003	0.0093	0	0	0.0014	0.0073	0	0	7	0	1	1	14%
Magnesium	mg/L					na	17	na	0	0	14	na	0	0	7	0	0	0	0%
Manganese	mg/L					na	0.033	na	0	0	0.041	na	0	0	7	0	0	0	0%
Mercury	mg/L					0.00005	0.0000054	0.00091	0	0	0.0000107	0.00091	0	0	7	0	0	0	0%
Molybdenum	mg/L					na	0.005	na	0	0	0.003	na	0	0	7	0	0	0	0%
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	<0.002	0.1064	0	0	<0.002	0.0908	0	0	7	0	0	0	0%
Selenium	mg/L					0.05	<0.001	0.005	0	0	<0.001	0.005	0	0	7	0	0	0	0%
Silver	mg/L	1.72	-6.52			0.1	<0.0002	0.0173	0	0	<0.0002	0.0125	0	0	7	0	0	0	0%
Strontium	mg/L					4	0.55	na	0	0	0.32	na	0	0	7	0	0	0	0%
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	7	0	0	0	0%
Uranium	mg/L					0.03	0.0058	na	0	0	0.008	na	0	0	7	0	0	0	0%
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	<0.008	0.2447	0	0	0.012	0.2087	0	0	7	0	0	0	0%
Hardness (calculated)	mg/L						232				192								

MONITORING SITE MLR SW-2 WATER QUALITY EXCEEDANCE SUMMARY

COLLECTION DATE		multipliers					6/12/2013				6/26/2014				8/29/2014				10/30/2014			
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1306-104	Aquatic	HHS Exc	Aq Exc	MLR-1406-103	Aquatic	HHS Exc	Aq Exc	MLR-1408-104	Aquatic	HHS Exc	Aq Exc	MLR-1410-104	Aquatic	HHS Exc	Aq Exc
TOTAL RECOVERABLE METALS																						
Aluminum (dissolved)	mg/L					na	<0.009	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0
Antimony	mg/L					0.0056	0.0006	na	0	0	<0.0005	na	0	0	<0.005	na	0	0	<0.0005	na	0	0
Arsenic	mg/L					0.01	0.011	0.15	1	0	0.011	0.15	1	0	0.015	0.15	1	0	0.010	0.15	0	0
Barium	mg/L					1.0	0.068	na	0	0	0.062	na	0	0	0.066	na	0	0	0.058	na	0	0
Beryllium	mg/L					0.004	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	0.00004	0.0005	0	0	0.00007	0.0004	0	0	0.00003	0.0005	0	0	0.00005	0.0005	0	0
Calcium	mg/L					na	60	na			55	na	0	0	62	na			59	na		
Chromium	mg/L					0.1	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Cobalt	mg/L					na	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	0.008	0.0174	0	0	0.009	0.0159	0	0	0.007	0.0181	0	0	0.006	0.0172	0	0
Iron	mg/L					na	0.09	1.0	0	0	0.09	1.0	0	0	0.04	1.0	0	0	0.09	1.0	0	0
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	0.0005	0.0081	0	0	0.0004	0.0070	0	0	<0.0003	0.0085	0	0	0.0005	0.0079	0	0
Magnesium	mg/L					na	14	na			12	na			15	na			14	na		
Manganese	mg/L					na	0.021	na	0	0	0.031	na	0	0	0.009	na	0	0	0.012	na	0	0
Mercury	mg/L					0.00005	<0.000005	0.00091	0	0	0.000005	0.00091	0	0	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0
Molybdenum	mg/L					na	0.004	na	0	0	0.003	na	0	0	0.004	na	0	0	0.003	na	0	0
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	<0.001	0.0967	0	0	<0.002	0.0885	0	0	<0.002	0.1003	0	0	<0.002	0.0957	0	0
Selenium	mg/L					0.05	0.0002	0.005	0	0	<0.001	0.005	0	0	<0.001	0.005	0	0	<0.001	0.005	0	0
Silver	mg/L	1.72	-6.52			0.1	<0.02	0.0142	0	0	<0.0002	0.0119	0	0	<0.0002	0.0153	0	0	<0.0002	0.0139	0	0
Strontium	mg/L					4	0.42	na	0	0	0.39	na	0	0	0.41	na	0	0	0.34	na	0	0
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0
Uranium	mg/L					0.03	<0.008	na	0	0	0.0033	na	0	0	0.0047	na	0	0	0.0058	na	0	0
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	0.012	0.2224	0	0	0.013	0.2034	0	0	0.008	0.2306	0	0	0.014	0.2201	0	0
Hardness (calculated)	mg/L						207				187				217				205			

COLLECTION DATE		multipliers					7/23/2015				11/20/2015				SW-2 EXCEEDANCE SUMMARY				
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1507-205	Aquatic	HHS Exc	Aq Exc	MLR-1511-104	Aquatic	HHS Exc	Aq Exc	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc
TOTAL RECOVERABLE METALS																			
Aluminum (dissolved)	mg/L					na	<0.009	0.087	0	0	<0.009	0.087	0	0	6	0	0	0	0%
Antimony	mg/L					0.0056	<0.0005	na	0	0	<0.0005	na	0	0	6	0	0	0	0%
Arsenic	mg/L					0.01	0.014	0.15	1	0	0.008	0.15	0	0	6	4	0	4	67%
Barium	mg/L					1.0	0.071	na	0	0	0.06	na	0	0	6	0	0	0	0%
Beryllium	mg/L					0.004	<0.0008	na	0	0	<0.0008	na	0	0	6	0	0	0	0%
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	0.00007	0.0005	0	0	0.00005	0.0004	0	0	6	0	0	0	0%
Calcium	mg/L					na	68	na	0	0	52	na	0	0	6	0	0	0	0%
Chromium	mg/L					0.1	<0.01	na	0	0	<0.01	na	0	0	6	0	0	0	0%
Cobalt	mg/L					na	<0.0025	na	0	0	<0.0025	na	0	0	6	0	0	0	0%
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	0.012	0.0200	0	0	0.007	0.0160	0	0	6	0	0	0	0%
Iron	mg/L					na	0.33	1.0	0	0	0.16	1.0	0	0	6	0	0	0	0%
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	0.0019	0.0099	0	0	0.001	0.0071	0	0	6	0	0	0	0%
Magnesium	mg/L					na	18	na	0	0	14	na	0	0	6	0	0	0	0%
Manganese	mg/L					na	0.046	na	0	0	0.018	na	0	0	6	0	0	0	0%
Mercury	mg/L					0.00005	0.00002	0.00091	0	0	0.000005	0.00091	0	0	6	0	0	0	0%
Molybdenum	mg/L					na	0.005	na	0	0	0.003	na	0	0	6	0	0	0	0%
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	<0.002	0.1109	0	0	<0.002	0.0888	0	0	6	0	0	0	0%
Selenium	mg/L					0.05	<0.001	0.005	0	0	<0.001	0.005	0	0	6	0	0	0	0%
Silver	mg/L	1.72	-6.52			0.1	<0.0002	0.0188	0	0	<0.0002	0.0120	0	0	6	0	0	0	0%
Strontium	mg/L					4	0.64	na	0	0	0.29	na	0	0	6	0	0	0	0%
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	6	0	0	0	0%
Uranium	mg/L					0.03	0.0048	na	0	0	0.0078	na	0	0	6	0	0	0	0%
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	0.02	0.2550	0	0	0.014	0.2041	0	0	6	0	0	0	0%
Hardness (calculated)	mg/L						244				187								

MONITORING SITE MLR SW-3 WATER QUALITY EXCEEDANCE SUMMARY

COLLECTION DATE		multipliers					6/12/2013				6/12/2013				6/26/2014				8/29/2014				10/30/2014			
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1306-101	Aquatic	HHS Exc	Aq Exc	MLR-1306-102 (DUP)	Aquatic	HHS Exc	Aq Exc	MLR-1406-101	Aquatic	HHS Exc	Aq Exc	MLR-1408-101	Aquatic	HHS Exc	Aq Exc	MLR-1410-102	Aquatic	HHS Exc	Aq Exc
TOTAL RECOVERABLE METALS																										
Aluminum (dissolved)	mg/L					na	0.011	0.087	0	0	0.013	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0
Antimony	mg/L					0.0056	0.0005	na	0	0	0.0005	na	0	0	<0.0005	na	0	0	0.0006	na	0	0	<0.0005	na	0	0
Arsenic	mg/L					0.01	0.014	0.15	1	0	0.014	0.15	1	0	0.013	0.15	1	0	0.015	0.15	1	0	0.002	0.15	0	0
Barium	mg/L					1.0	0.077	na	0	0	0.076	na	0	0	0.058	na	0	0	0.069	na	0	0	0.051	na	0	0
Beryllium	mg/L					0.004	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	0.00011	0.0005	0	0	0.0001	0.0005	0	0	0.00011	0.0004	0	0	0.00007	0.0005	0	0	<0.00003	0.0004	0	0
Calcium	mg/L					na	58	na			58	na			53	na			61	na			48	na		
Chromium	mg/L					0.1	<0.01	na	0	0	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Cobalt	mg/L					na	<0.01	na	0	0	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	0.018	0.0170	0	1	0.017	0.0170	0	0	0.012	0.0155	0	0	0.009	0.0182	0	0	<0.002	0.0143	0	0
Iron	mg/L					na	0.37	1.0	0	0	0.37	1.0	0	0	0.07	1.0	0	0	0.05	1.0	0	0	<0.02	1.0	0	0
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	0.0014	0.0078	0	0	0.0014	0.0078	0	0	0.0004	0.0068	0	0	0.0003	0.0086	0	0	<0.0003	0.0060	0	0
Magnesium	mg/L					na	14	na			14	na			12	na			16	na			11	na		
Manganese	mg/L					na	0.028	na	0	0	0.028	na	0	0	0.010	na	0	0	0.005	na	0	0	0.213	na	0	0
Mercury	mg/L					0.00005	0.0000071	0.00091	0	0	0.0000079	0.00091	0	0	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0
Molybdenum	mg/L					na	0.005	na	0	0	0.005	na	0	0	0.004	na	0	0	0.005	na	0	0	0.003	na	0	0
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	0.001	0.0947	0	0	<0.001	0.0947	0	0	<0.002	0.0865	0	0	<0.002	0.1009	0	0	<0.002	0.0797	0	0
Selenium	mg/L					0.05	<0.0002	0.005	0	0	<0.0002	0.005	0	0	<0.001	0.005	0	0	<0.001	0.005	0	0	<0.001	0.005	0	0
Silver	mg/L	1.72	-6.52			0.1	<0.02	0.0137	0	0	<0.02	0.0137	0	0	<0.0002	0.0113	0	0	<0.0002	0.0155	0	0	<0.0002	0.0096	0	0
Strontium	mg/L					4	0.43	na	0	0	0.422	na	0	0	0.35	na	0	0	0.42	na	0	0	0.30	na	0	0
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0
Uranium	mg/L					0.03	<0.008	na	0	0	<0.008	na	0	0	0.0031	na	0	0	0.0048	na	0	0	0.0027	na	0	0
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	0.025	0.2178	0	0	0.024	0.2178	0	0	0.015	0.1988	0	0	0.009	0.2321	0	0	<0.008	0.1833	0	0
Hardness	mg/L						202				202				182				218				165			

COLLECTION DATE		multipliers					7/23/2015				11/20/2015				SW-3 EXCEEDANCE SUMMARY				
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1507-201	Aquatic	HHS Exc	Aq Exc	MLR-1511-101	Aquatic	HHS Exc	Aq Exc	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc
TOTAL RECOVERABLE METALS																			
Aluminum (dissolved)	mg/L					na	<0.009	0.087	0	0	<0.009	0.087	0	0	6	0	0	0	0%
Antimony	mg/L					0.0056	0.0006	na	0	0	<0.0005	na	0	0	6	0	0	0	0%
Arsenic	mg/L					0.01	0.014	0.15	1	0	0.009	0.15	0	0	6	5	0	5	83%
Barium	mg/L					1.0	0.059	na	0	0	0.061	na	0	0	6	0	0	0	0%
Beryllium	mg/L					0.004	<0.0008	na	0	0	<0.0008	na	0	0	6	0	0	0	0%
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	0.00004	0.0005	0	0	0.0001	0.0004	0	0	6	0	0	0	0%
Calcium	mg/L					na	55	na	0	0	56	na	0	0	6	0	0	0	0%
Chromium	mg/L					0.1	<0.01	na	0	0	<0.01	na	0	0	6	0	0	0	0%
Cobalt	mg/L					na	<0.005	na	0	0	<0.005	na	0	0	6	0	0	0	0%
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	0.008	0.0174	0	0	0.007	0.0167	0	0	6	0	1	1	17%
Iron	mg/L					na	0.06	1.0	0	0	0.23	1.0	0	0	6	0	0	0	0%
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	0.0003	0.0080	0	0	0.0008	0.0076	0	0	6	0	0	0	0%
Magnesium	mg/L					na	17	na	0	0	14	na	0	0	6	0	0	0	0%
Manganese	mg/L					na	0.008	na	0	0	0.014	na	0	0	6	0	0	0	0%
Mercury	mg/L					0.00005	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0	6	0	0	0	0%
Molybdenum	mg/L					na	0.005	na	0	0	0.003	na	0	0	6	0	0	0	0%
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	<0.002	0.0967	0	0	<0.002	0.0928	0	0	6	0	0	0	0%
Selenium	mg/L					0.05	<0.001	0.005	0	0	<0.001	0.005	0	0	6	0	0	0	0%
Silver	mg/L	1.72	-6.52			0.1	<0.0002	0.0142	0	0	<0.0002	0.0131	0	0	6	0	0	0	0%
Strontium	mg/L					4	0.5	na	0	0	0.28	na	0	0	6	0	0	0	0%
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	6	0	0	0	0%
Uranium	mg/L					0.03	0.0043	na	0	0	0.0075	na	0	0	6	0	0	0	0%
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	<0.008	0.2222	0	0	0.016	0.2133	0	0	6	0	0	0	0%
Hardness	mg/L						207				197								

MONITORING SITE MLR SW-4 WATER QUALITY EXCEEDANCE SUMMARY

COLLECTION DATE		multipliers					6/13/2013				8/22/2013				8/22/2013				6/26/2014				8/29/2014				10/30/2014			
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1306-107	Aquatic	HHS Exc	Aq Exc	MLR-1308-103	Aquatic	HHS Exc	Aq Exc	MLR-1308-104	Aquatic	HHS Exc	Aq Exc	MLR-1406-107	Aquatic	HHS Exc	Aq Exc	MLR-1408-105	Aquatic	HHS Exc	Aq Exc	MLR-1410-106	Aquatic	HHS Exc	Aq Exc
TOTAL RECOVERABLE METALS																														
Aluminum (dissolved)	mg/L					na	<0.009	0.087	0	0	0.011	0.087	0	0	0.017	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0
Antimony	mg/L					0.0056	<0.0005	na	0	0	<0.0005	na	0	0	<0.0005	na	0	0	<0.0005	na	0	0	<0.0005	na	0	0	<0.0005	na	0	0
Arsenic	mg/L					0.01	0.017	0.15	1	0	0.018	0.15	1	0	0.018	0.15	1	0	0.018	0.15	1	0	0.019	0.15	1	0	0.017	0.15	1	0
Barium	mg/L					1.0	0.062	na	0	0	0.058	na	0	0	0.057	na	0	0	0.055	na	0	0	0.055	na	0	0	0.053	na	0	0
Beryllium	mg/L					0.004	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	0.00004	0.0008	0	0	<0.00003	0.0009	0	0	<0.00003	0.0009	0	0	<0.00003	0.0009	0	0	<0.00003	0.0009	0	0	<0.00003	0.0009	0	0
Calcium	mg/L					na	125	na			147	na			146	na			134	na			130	na			143	na		
Chromium	mg/L					0.1	<0.01	na	0	0	<0.01	na	0	0	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Cobalt	mg/L					na	<0.01	na	0	0	<0.01	na	0	0	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	<0.002	0.0341	0	0	0.002	0.0389	0	0	0.002	0.0387	0	0	<0.002	0.0358	0	0	<0.002	0.0352	0	0	<0.002	0.0372	0	0
Iron	mg/L					na	0.93	1.0	0	0	0.83	1.0	0	0	0.82	1.0	0	0	0.63	1.0	0	0	0.39	1.0	0	0	0.35	1.0	0	0
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	0.0007	0.0220	0	0	0.0006	0.0267	0	0	0.0006	0.0265	0	0	0.0006	0.0236	0	0	<0.0003	0.0230	0	0	<0.0003	0.0250	0	0
Magnesium	mg/L					na	35	na			40	na			40	na			36	na			36	na			36	na		
Manganese	mg/L					na	0.051	na	0	0	0.051	na	0	0	0.05	na	0	0	0.050	na	0	0	0.040	na	0	0	0.034	na	0	0
Mercury	mg/L					0.00005	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0
Molybdenum	mg/L					na	0.021	na	0	0	0.017	na	0	0	0.016	na	0	0	0.020	na	0	0	0.018	na	0	0	0.012	na	0	0
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	<0.001	0.1884	0	0	<0.001	0.2144	0	0	<0.001	0.2136	0	0	<0.002	0.1976	0	0	<0.002	0.1942	0	0	<0.002	0.2054	0	0
Selenium	mg/L					0.05	0.0011	0.005	0	0	0.0019	0.005	0	0	0.0019	0.005	0	0	0.001	0.005	0	0	0.002	0.005	0	0	0.003	0.005	0	0
Silver	mg/L	1.72	-6.52			0.1	<0.02	0.0552	0	0	<0.02	0.0719	0	0	<0.02	0.0713	0	0	<0.0002	0.0609	0	0	<0.0002	0.0587	0	0	<0.0002	0.0658	0	0
Strontium	mg/L					4	1.62	na	0	0	1.82	na	0	0	1.79	na	0	0	1.67	na	0	0	1.66	na	0	0	1.81	na	0	0
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0
Uranium	mg/L					0.03	0.010	na	0	0	0.011	na	0	0	0.011	na	0	0	0.010	na	0	0	0.010	na	0	0	0.010	na	0	0
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	0.004	0.4335	0	0	0.004	0.4936	0	0	0.004	0.4917	0	0	<0.008	0.4549	0	0	<0.008	0.4469	0	0	<0.008	0.4727	0	0
Hardness	mg/L						456				532				529				483				473				505			

COLLECTION DATE		multipliers					10/30/2014				7/23/2015				11/20/2015				SW-4 EXCEEDANCE SUMMARY				
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1410-107	Aquatic	HHS Exc	Aq Exc	MLR-1410-107	Aquatic	HHS Exc	Aq Exc	MLR-1410-107	Aquatic	HHS Exc	Aq Exc	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc
TOTAL RECOVERABLE METALS																							
Aluminum (dissolved)	mg/L					na	<0.009	0.087	0	0	0.06	0.087	0	0	<0.009	0.087	0	0	7	0	0	0	0%
Antimony	mg/L					0.0056	<0.0005	na	0	0	<0.0005	na	0	0	<0.0005	na	0	0	7	0	0	0	0%
Arsenic	mg/L					0.01	0.017	0.15	1	0	0.018	0.15	1	0	0.018	0.15	1	0	7	7	0	7	100%
Barium	mg/L					1.0	0.052	na	0	0	0.065	na	0	0	0.078	na	0	0	7	0	0	0	0%
Beryllium	mg/L					0.004	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	7	0	0	0	0%
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	<0.00003	0.0009	0	0	0.00003	0.0009	0	0	0.00006	0.0009	0	0	7	0	0	0	0%
Calcium	mg/L					na	141	na			138	na	0	0	136	na	0	0	7	0	0	0	0%
Chromium	mg/L					0.1	<0.005	na	0	0	<0.01	na	0	0	<0.01	na	0	0	7	0	0	0	0%
Cobalt	mg/L					na	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0	7	0	0	0	0%
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	<0.002	0.0367	0	0	<0.002	0.0359	0	0	0.003	0.0361	0	0	7	0	0	0	0%
Iron	mg/L					na	0.39	1.0	0	0	0.83	1.0	0	0	2.13	1.0	0	1	7	0	1	1	14%
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	<0.0003	0.0244	0	0	0.0005	0.0237	0	0	0.0013	0.0239	0	0	7	0	0	0	0%
Magnesium	mg/L					na	35	na			34	na	0	0	36	na	0	0	7	0	0	0	0%
Manganese	mg/L					na	0.036	na	0	0	0.057	na	0	0	0.100	na	0	0	7	0	0	0	0%
Mercury	mg/L					0.00005	<0.000005	0.00091	0	0	0.000005	0.00091	0	0	0.000006	0.00091	0	0	7	0	0	0	0%
Molybdenum	mg/L					na	0.012	na	0	0	0.013	na	0	0	0.010	na	0	0	7	0	0	0	0%
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	<0.002	0.2022	0	0	<0.002	0.1982	0	0	<0.002	0.1993	0	0	7	0	0	0	0%
Selenium	mg/L					0.05	0.003	0.005	0	0	0.002	0.005	0	0	0.002	0.005	0	0	7	0	0	0	0%
Silver	mg/L	1.72	-6.52			0.1	<0.0002	0.0638	0	0	<0.0002	0.0613	0	0	<0.0002	0.0620	0	0	7	0	0	0	0%
Strontium	mg/L					4	1.79	na	0	0	1.66	na	0	0	1.82	na	0	0	7	0	0	0	0%
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	7	0	0	0	0%
Uranium	mg/L					0.03	0.010	na	0	0	0.008	na	0	0	0.012	na	0	0	7	0	0	0	0%
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	<0.008	0.4655	0	0	<0.008	0.4563	0	0	<0.008	0.4588	0	0	7	0	0	0	0%
Hardness	mg/L						496				485				488								

MONITORING SITE MLR SW-5 WATER QUALITY EXCEEDANCE SUMMARY

COLLECTION DATE		multipliers					6/12/2013				8/22/2013				6/26/2014				8/29/2014				10/30/2014			
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1306-108	Aquatic	HHS Exc	Aq Exc	MLR-1308-105	Aquatic	HHS Exc	Aq Exc	MLR-1406-105	Aquatic	HHS Exc	Aq Exc	MLR-1408-108	Aquatic	HHS Exc	Aq Exc	MLR-1410-100	Aquatic	HHS Exc	Aq Exc
TOTAL RECOVERABLE METALS																										
Aluminum (dissolved)	mg/L					na	<0.009	0.087	0	0	0.017	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0
Antimony	mg/L					0.0056	<0.0005	na	0	0	<0.0005	na	0	0	<0.0005	na	0	0	<0.005	na	0	0	<0.0005	na	0	0
Arsenic	mg/L					0.01	0.003	0.15	0	0	0.011	0.15	1	0	0.013	0.15	1	0	0.012	0.15	1	0	0.012	0.15	1	0
Barium	mg/L					1.0	0.087	na	0	0	0.061	na	0	0	0.066	na	0	0	0.061	na	0	0	0.056	na	0	0
Beryllium	mg/L					0.004	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	<0.00003	0.0010	0	0	<0.00003	0.0009	0	0	0.00003	0.0009	0	0	<0.00003	0.0009	0	0	<0.00003	0.0009	0	0
Calcium	mg/L					na	195	na			153	na			141	na			140	na			148	na		
Chromium	mg/L					0.1	<0.01	na	0	0	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Cobalt	mg/L					na	<0.01	na	0	0	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	<0.002	0.0430	0	0	<0.002	0.0388	0	0	<0.002	0.0364	0	0	<0.002	0.0368	0	0	<0.002	0.0378	0	0
Iron	mg/L					na	0.23	1.0	0	0	0.34	1.0	0	0	0.48	1.0	0	0	0.22	1.0	0	0	0.23	1.0	0	0
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	<0.0003	0.0310	0	0	<0.0003	0.0266	0	0	0.0003	0.0242	0	0	<0.0003	0.0245	0	0	<0.0003	0.0255	0	0
Magnesium	mg/L					na	27	na			36	na			34	na			36	na			35	na		
Manganese	mg/L					na	0.142	na	0	0	0.090	na	0	0	0.100	na	0	0	0.101	na	0	0	0.103	na	0	0
Mercury	mg/L					0.00005	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0
Molybdenum	mg/L					na	<0.002	na	0	0	0.007	na	0	0	0.006	na	0	0	0.007	na	0	0	0.007	na	0	0
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	0.001	0.2369	0	0	<0.001	0.2139	0	0	<0.002	0.2008	0	0	<0.002	0.2028	0	0	<0.002	0.2082	0	0
Selenium	mg/L					0.05	<0.0002	0.005	0	0	0.0026	0.005	0	0	0.0030	0.005	0	0	0.0030	0.005	0	0	0.0030	0.005	0	0
Silver	mg/L	1.72	-6.52			0.1	<0.02	0.0880	0	0	<0.02	0.0715	0	0	<0.0002	0.0629	0	0	<0.0002	0.0642	0	0	<0.0002	0.0677	0	0
Strontium	mg/L					4	2.22	na	0	0	1.56	na	0	0	1.51	na	0	0	1.51	na	0	0	1.62	na	0	0
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0
Uranium	mg/L					0.03	<0.008	na	0	0	0.011	na	0	0	0.010	na	0	0	0.009	na	0	0	0.009	na	0	0
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	0.002	0.5453	0	0	0.003	0.4925	0	0	<0.008	0.4622	0	0	<0.008	0.4668	0	0	<0.008	0.4794	0	0
Hardness	mg/L						598				530				492				498				514			

COLLECTION DATE		multipliers					7/23/2015				11/20/2015				SW-5 EXCEEDANCE SUMMARY				
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1507-208	Aquatic	HHS Exc	Aq Exc	MLR-1511-107	Aquatic	HHS Exc	Aq Exc	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc
TOTAL RECOVERABLE METALS																			
Aluminum (dissolved)	mg/L					na	<0.009	0.087	0	0	<0.009	0.087	0	0	7	0	0	0	0%
Antimony	mg/L					0.0056	<0.0005	na	0	0	<0.0005	na	0	0	7	0	0	0	0%
Arsenic	mg/L					0.01	0.011	0.15	1	0	0.013	0.15	1	0	7	6	0	6	86%
Barium	mg/L					1.0	0.082	na	0	0	0.056	na	0	0	7	0	0	0	0%
Beryllium	mg/L					0.004	<0.0008	na	0	0	<0.0008	na	0	0	7	0	0	0	0%
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	<0.00003	0.0008	0	0	<0.00003	0.0009	0	0	7	0	0	0	0%
Calcium	mg/L					na	129	na	0	0	142	na	0	0	7	0	0	0	0%
Chromium	mg/L					0.1	<0.01	na	0	0	<0.01	na	0	0	7	0	0	0	0%
Cobalt	mg/L					na	<0.005	na	0	0	<0.005	na	0	0	7	0	0	0	0%
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	<0.002	0.0334	0	0	<0.002	0.0368	0	0	7	0	0	0	0%
Iron	mg/L					na	0.65	1.0	0	0	0.57	1.0	0	0	7	0	0	0	0%
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	0.0005	0.0213	0	0	0.0003	0.0246	0	0	7	0	0	0	0%
Magnesium	mg/L					na	30	na	0	0	35	na	0	0	7	0	0	0	0%
Manganese	mg/L					na	0.128	na	0	0	0.162	na	0	0	7	0	0	0	0%
Mercury	mg/L					0.00005	0.0000051	0.00091	0	0	<0.000005	0.00091	0	0	7	0	0	0	0%
Molybdenum	mg/L					na	0.005	na	0	0	0.007	na	0	0	7	0	0	0	0%
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	<0.002	0.1847	0	0	<0.002	0.2031	0	0	7	0	0	0	0%
Selenium	mg/L					0.05	0.002	0.005	0	0	0.002	0.005	0	0	7	0	0	0	0%
Silver	mg/L	1.72	-6.52			0.1	<0.0002	0.0530	0	0	<0.0002	0.0644	0	0	7	0	0	0	0%
Strontium	mg/L					4	1.5	na	0	0	1.54	na	0	0	7	0	0	0	0%
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	7	0	0	0	0%
Uranium	mg/L					0.03	0.0071	na	0	0	0.0087	na	0	0	7	0	0	0	0%
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	<0.008	0.4250	0	0	<0.008	0.4675	0	0	7	0	0	0	0%
Hardness	mg/L						446				499								

MONITORING SITE MLR SW-6 WATER QUALITY EXCEEDANCE SUMMARY

COLLECTION DATE		multipliers					6/12/2013				8/22/2013				6/26/2014				8/29/2014				10/30/2014			
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1306-100	Aquatic	HHS Exc	Aq Exc	MLR-1308-100	Aquatic	HHS Exc	Aq Exc	MLR-1406-100	Aquatic	HHS Exc	Aq Exc	MLR-1408-100	Aquatic	HHS Exc	Aq Exc	MLR-1410-101	Aquatic	HHS Exc	Aq Exc
TOTAL RECOVERABLE METALS																										
Aluminum (dissolved)	mg/L					na	<0.009	0.087	0	0	0.026	0.087	0	0	0.011	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0
Antimony	mg/L					0.0056		na	0	0	0.0006	na	0	0	0.0009	na	0	0	0.0007	na	0	0	<0.0005	na	0	0
Arsenic	mg/L					0.01	0.013	0.15	1	0	0.012	0.15	1	0	0.019	0.15	1	0	0.017	0.15	1	0	0.010	0.15	0	0
Barium	mg/L					1.0	0.058	na	0	0	0.081	na	0	0	0.065	na	0	0	0.073	na	0	0	0.064	na	0	0
Beryllium	mg/L					0.004	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	0.00011	0.0004	0	0	0.00004	0.0005	0	0	0.00026	0.00034	0	0	0.00011	0.00044	0	0	0.00009	0.00044	0	0
Calcium	mg/L					na	48	na			57	na			39	na			56	na			56	na		
Chromium	mg/L					0.1	<0.01	na	0	0	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Cobalt	mg/L					na	<0.01	na	0	0	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	0.021	0.0143	0	1	0.006	0.0172	0	0	0.055	0.0120	0	1	0.0160	0.0164	0	0	0.013	0.0164	0	0
Iron	mg/L					na	0.45	1.0	0	0	0.08	1.0	0	0	1.20	1.0	0	1	0.27	1.0	0	0	0.29	1.0	0	0
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	0.0025	0.0060	0	0	0.0004	0.0079	0	0	0.0095	0.0046	0	1	0.0022	0.0074	0	0	0.0020	0.0074	0	0
Magnesium	mg/L					na	11	na			15	na			9	na			13	na			13	na		
Manganese	mg/L					na	0.074	na	0	0	0.022	na	0	0	0.154	na	0	0	0.082	na	0	0	0.067	na	0	0
Mercury	mg/L					0.00005	0.000012	0.00091	0	0	0.000006	0.00091	0	0	0.00026	0.00091	1	0	0.000047	0.00091	0	0	0.000015	0.00091	0	0
Molybdenum	mg/L					na	0.003	na	0	0	0.004	na	0	0	0.002	na	0	0	0.003	na	0	0	0.003	na	0	0
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	<0.001	0.0797	0	0	<0.001	0.0954	0	0	<0.002	0.0670	0	0	<0.002	0.0911	0	0	<0.002	0.0911	0	0
Selenium	mg/L					0.05	<0.0002	0.005	0	0	<0.0002	0.005	0	0	<0.001	0.005	0	0	<0.001	0.005	0	0	<0.001	0.005	0	0
Silver	mg/L	1.72	-6.52			0.1	<0.02	0.0096	0	0	<0.02	0.0138	0	0	0.0003	0.0068	0	0	<0.0002	0.0126	0	0	<0.0002	0.0126	0	0
Strontium	mg/L					4	0.26	na	0	0	0.37	na	0	0	0.20	na	0	0	0.27	na	0	0	0.26	na	0	0
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0
Uranium	mg/L					0.03	<0.008	na	0	0	<0.008	na	0	0	0.0031	na	0	0	0.0049	na	0	0	0.0059	na	0	0
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	0.026	0.1833	0	0	0.007	0.2193	0	0	0.063	0.1540	0	0	0.019	0.2095	0	0	0.020	0.2095	0	0
Hardness	mg/L						165				204				134				193				193			

COLLECTION DATE		multipliers					7/23/2015				11/20/2015				SW-6 EXCEEDANCE SUMMARY				
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1507-200	Aquatic	HHS Exc	Aq Exc	MLR-1511-100	Aquatic	HHS Exc	Aq Exc	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc
TOTAL RECOVERABLE METALS																			
Aluminum (dissolved)	mg/L					na	<0.009	0.087	0	0	<0.009	0.087	0	0	7	0	0	0	0%
Antimony	mg/L					0.0056	<0.0005	na	0	0	0.0005	na	0	0	7	0	0	0	0%
Arsenic	mg/L					0.01	0.011	0.15	1	0	0.009	0.15	0	0	7	5	0	5	71%
Barium	mg/L					1.0	0.056	na	0	0	0.064	na	0	0	7	0	0	0	0%
Beryllium	mg/L					0.004	<0.0008	na	0	0	<0.0008	na	0	0	7	0	0	0	0%
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	0.00003	0.00040	0	0	0.0001	0.00044	0	0	7	0	0	0	0%
Calcium	mg/L					na	47	na	0	0	54	na	0	0	7	0	0	0	0%
Chromium	mg/L					0.1	<0.01	na	0	0	<0.01	na	0	0	7	0	0	0	0%
Cobalt	mg/L					na	<0.005	na	0	0	<0.005	na	0	0	7	0	0	0	0%
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	0.008	0.0147	0	0	0.01	0.0163	0	0	7	0	2	2	29%
Iron	mg/L					na	0.04	1.0	0	0	0.23	1.0	0	0	7	0	1	1	14%
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	<0.0003	0.0063	0	0	0.0017	0.0073	0	0	7	0	1	1	14%
Magnesium	mg/L					na	13	na	0	0	14	na	0	0	7	0	0	0	0%
Manganese	mg/L					na	0.035	na	0	0	0.049	na	0	0	7	0	0	0	0%
Mercury	mg/L					0.00005	0.0000068	0.00091	0	0	0.00002	0.00091	0	0	7	1	0	1	14%
Molybdenum	mg/L					na	0.003	na	0	0	0.003	na	0	0	7	0	0	0	0%
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	<0.002	0.0821	0	0	<0.002	0.0908	0	0	7	0	0	0	0%
Selenium	mg/L					0.05	<0.001	0.005	0	0	<0.001	0.005	0	0	7	0	0	0	0%
Silver	mg/L	1.72	-6.52			0.1	<0.0002	0.0102	0	0	<0.00021	0.0125	0	0	7	0	0	0	0%
Strontium	mg/L					4	0.31	na	0	0	0.26	na	0	0	7	0	0	0	0%
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	7	0	0	0	0%
Uranium	mg/L					0.03	0.005	na	0	0	0.0077	na	0	0	7	0	0	0	0%
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	<0.008	0.1887	0	0	0.015	0.2087	0	0	7	0	0	0	0%
Hardness	mg/L						171				192								

POND MONITORING SITE WATER QUALITY EXCEEDANCE SUMMARY

COLLECTION DATE		multipliers					6/12/2013				8/22/2013				6/26/2014				8/29/2014				10/30/2014			
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1306-103	Aquatic	HHS Exc	Aq Exc	MLR-1308-101	Aquatic	HHS Exc	Aq Exc	MLR-1406-102	Aquatic	HHS Exc	Aq Exc	MLR-1408-103	Aquatic	HHS Exc	Aq Exc	MLR-1410-103	Aquatic	HHS Exc	Aq Exc
TOTAL RECOVERABLE METALS																										
Aluminum (dissolved)	mg/L					na	<0.009	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0	<0.009	0.087	0	0
Antimony	mg/L					0.0056	<0.0005	na	0	0	<0.0005	na	0	0	<0.0005	na	0	0	<0.005	na	0	0	<0.0005	na	0	0
Arsenic	mg/L					0.01	0.005	0.15	0	0	0.004	0.15	0	0	0.004	0.15	0	0	0.004	0.15	0	0	0.004	0.15	0	0
Barium	mg/L					1.0	0.083	na	0	0	0.110	na	0	0	0.085	na	0	0	0.088	na	0	0	0.100	na	0	0
Beryllium	mg/L					0.004	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0	<0.0008	na	0	0
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	0.00004	0.0006	0	0	<0.00003	0.0006	0	0	0.00006	0.0006	0	0	<0.00003	0.0007	0	0	0.00004	0.0007	0	0
Calcium	mg/L					na	84	na			92	na			92	na			95	na			100	na		
Chromium	mg/L					0.1	<0.01	na	0	0	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Cobalt	mg/L					na	<0.01	na	0	0	<0.01	na	0	0	<0.005	na	0	0	<0.005	na	0	0	<0.005	na	0	0
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	<0.002	0.0230	0	0	<0.002	0.0252	0	0	<0.002	0.0249	0	0	<0.002	0.0260	0	0	<0.002	0.0266	0	0
Iron	mg/L					na	<0.02	1.0	0	0	0.06	1.0	0	0	0.03	1.0	0	0	<0.02	1.0	0	0	0.04	1.0	0	0
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	<0.0003	0.0122	0	0	<0.0003	0.0140	0	0	<0.0003	0.0138	0	0	<0.0003	0.0147	0	0	<0.0003	0.0151	0	0
Magnesium	mg/L					na	19	na			22	na			21	na			23	na			22	na		
Manganese	mg/L					na	0.265	na	0	0	0.198	na	0	0	0.213	na	0	0	0.093	na	0	0	0.422	na	0	0
Mercury	mg/L					0.00005	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0
Molybdenum	mg/L					na	0.006	na	0	0	0.007	na	0	0	0.005	na	0	0	0.006	na	0	0	0.005	na	0	0
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	0.001	0.1276	0	0	0.001	0.1397	0	0	<0.002	0.1381	0	0	<0.002	0.1439	0	0	<0.002	0.1470	0	0
Selenium	mg/L					0.05	<0.0002	0.005	0	0	<0.0002	0.005	0	0	<0.001	0.005	0	0	<0.001	0.005	0	0	<0.001	0.005	0	0
Silver	mg/L	1.72	-6.52			0.1	<0.02	0.0250	0	0	<0.02	0.0301	0	0	<0.0002	0.0294	0	0	<0.0002	0.0320	0	0	<0.0002	0.0334	0	0
Strontium	mg/L					4	0.50	na	0	0	0.60	na	0	0	0.57	na	0	0	0.61	na	0	0	0.62	na	0	0
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0	<0.0002	na	0	0
Uranium	mg/L					0.03	<0.008	na	0	0	<0.008	na	0	0	0.005	na	0	0	0.005	na	0	0	0.005	na	0	0
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	<0.002	0.2936	0	0	<0.002	0.3213	0	0	<0.008	0.3178	0	0	<0.008	0.3311	0	0	<0.008	0.3382	0	0
Hardness	mg/L						288				320				316				332				340			

COLLECTION DATE		multipliers					7/23/2015				11/20/2015				POND EXCEEDANCE SUMMARY				
SAMPLE CODE		ma	ba	mc	bc	HHS	MLR-1507-203	Aquatic	HHS Exc	Aq Exc	MLR-1511-103	Aquatic	HHS Exc	Aq Exc	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc
TOTAL RECOVERABLE METALS																			
Aluminum (dissolved)	mg/L					na	<0.009	0.087	0	0	<0.009	0.087	0	0	7	0	0	0	0%
Antimony	mg/L					0.0056	<0.0005	na	0	0	<0.0005	na	0	0	7	0	0	0	0%
Arsenic	mg/L					0.01	0.004	0.15	0	0	0.005	0.15	0	0	7	0	0	0	0%
Barium	mg/L					1.0	0.085	na	0	0	0.098	na	0	0	7	0	0	0	0%
Beryllium	mg/L					0.004	<0.0008	na	0	0	<0.0008	na	0	0	7	0	0	0	0%
Cadmium	mg/L	1.0166	-3.924	0.7409	-4.719	0.005	0.00003	0.0006	0	0	0.00006	0.0007	0	0	7	0	0	0	0%
Calcium	mg/L					na	74	na	0	0	101	na	0	0	7	0	0	0	0%
Chromium	mg/L					0.1	<0.01	na	0	0	<0.01	na	0	0	7	0	0	0	0%
Cobalt	mg/L					na	<0.005	na	0	0	<0.005	na	0	0	7	0	0	0	0%
Copper	mg/L	0.9422	-1.7	0.8545	-1.702	1.3	<0.002	0.0213	0	0	<0.002	0.0276	0	0	7	0	0	0	0%
Iron	mg/L					na	0.04	1.0	0	0	0.04	1.0	0	0	7	0	0	0	0%
Lead	mg/L	1.273	-1.46	1.273	-4.705	0.015	<0.0003	0.0109	0	0	<0.0003	0.0160	0	0	7	0	0	0	0%
Magnesium	mg/L					na	19	na	0	0	25	na	0	0	7	0	0	0	0%
Manganese	mg/L					na	0.224	na	0	0	0.259	na	0	0	7	0	0	0	0%
Mercury	mg/L					0.00005	<0.000005	0.00091	0	0	<0.000005	0.00091	0	0	7	0	0	0	0%
Molybdenum	mg/L					na	0.007	na	0	0	0.004	na	0	0	7	0	0	0	0%
Nickel	mg/L	0.846	2.255	0.846	0.0584	0.1	<0.002	0.1182	0	0	<0.002	0.1524	0	0	7	0	0	0	0%
Selenium	mg/L					0.05	<0.001	0.005	0	0	<0.001	0.005	0	0	7	0	0	0	0%
Silver	mg/L	1.72	-6.52			0.1	<0.0002	0.0214	0	0	<0.0002	0.0359	0	0	7	0	0	0	0%
Strontium	mg/L					4	0.5	na	0	0	0.64	na	0	0	7	0	0	0	0%
Thallium	mg/L					0.00024	<0.0002	na	0	0	<0.0002	na	0	0	7	0	0	0	0%
Uranium	mg/L					0.03	0.0049	na	0	0	0.0067	na	0	0	7	0	0	0	0%
Zinc	mg/L	0.8473	0.884	0.8473	0.884	2	<0.008	0.2719	0	0	<0.008	0.3506	0	0	7	0	0	0	0%
Hardness	mg/L						263				355								

BASELINE SURFACE WATER MONITORING WATER EXCEEDANCE SUMMARY - MONTANA LIMESTONE RESOURCES PROJECT

	SW-1 EXCEEDANCE SUMMARY					SW-2 EXCEEDANCE SUMMARY					SW-3 EXCEEDANCE SUMMARY					SW-4 EXCEEDANCE SUMMARY				
	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc
Aluminum (dissolved)	7	0	0	0	0.0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Antimony	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Arsenic	7	5	0	5	71%	6	4	0	4	67%	6	5	0	5	83%	7	7	0	7	100%
Barium	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Beryllium	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Cadmium	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Chromium	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Cobalt	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Copper	7	0	1	1	14%	6	0	0	0	0%	6	0	1	1	17%	7	0	0	0	0%
Iron	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	1	1	14%
Lead	7	0	1	1	14%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Manganese	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Mercury	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Molybdenum	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Nickel	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Selenium	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Silver	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Strontium	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Thallium	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Uranium	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%
Zinc	7	0	0	0	0%	6	0	0	0	0%	6	0	0	0	0%	7	0	0	0	0%

	SW-5 EXCEEDANCE SUMMARY					SW-6 EXCEEDANCE SUMMARY					POND EXCEEDANCE SUMMARY					TOTAL				
	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc	# Samples	# HHS Exc	# Aquatic Exc	Total Exc	% Exc
Aluminum (dissolved)	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Antimony	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Arsenic	7	6	0	6	86%	7	5	0	5	71%	7	0	0	0	0%	47	32	0	32	68%
Barium	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Beryllium	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Cadmium	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Chromium	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Cobalt	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Copper	7	0	0	0	0%	7	0	2	2	29%	7	0	0	0	0%	47	0	4	4	9%
Iron	7	0	0	0	0%	7	0	1	1	14%	7	0	0	0	0%	47	0	2	2	4%
Lead	7	0	0	0	0%	7	0	1	1	14%	7	0	0	0	0%	47	0	2	2	4%
Manganese	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Mercury	7	0	0	0	0%	7	1	0	1	14%	7	0	0	0	0%	47	1	0	1	2%
Molybdenum	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Nickel	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Selenium	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Silver	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Strontium	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Thallium	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Uranium	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%
Zinc	7	0	0	0	0%	7	0	0	0	0%	7	0	0	0	0%	47	0	0	0	0%

APPENDIX C

MONITORING WELL AND PRIVATE WELL LOGS

GW 4

11N 15W 22 AA

Approved Stock Form—State Publishing Co., Helena, Montana—41338 Order No. 3

File No.....

(4) 039 T..... R. 22 AA

TRIPLICATE

County.....

RECEIVED DEC 3 Montana Bureau of Mines and Geology

CODED

STATE OF MONTANA
ADMINISTRATOR OF GROUNDWATER CODE
OFFICE OF STATE ENGINEER

127434

ELEV. 3900

Declaration of Vested Groundwater Rights

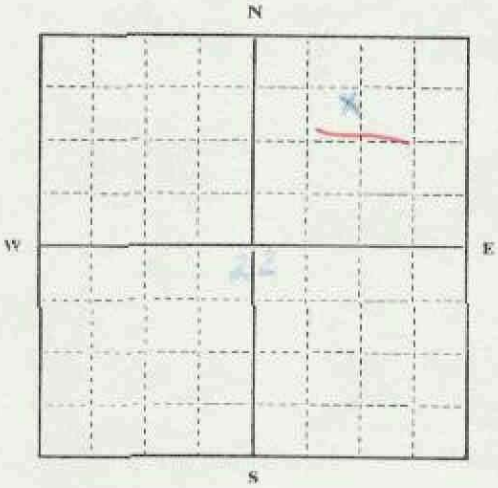
(Under Chapter 237, Montana Session Laws, 1961)

Carl Nelson

RESIDENTIAL WELL #1

1. ....., of .....
(Name of Appropriator) (Address) (Town)

County of ..... State of .....
have appropriated groundwater according to the Montana laws in effect prior to January 1, 1962, as follows:



.....¼..... Sec..... T..... R.....

Indicate point of appropriation and place of use, if possible. Each small square represents 10 acres.

2. The beneficial use on which the claim is based.....

3. Date or approximate date of earliest beneficial use; and how continuous the use has been.....

4. The amount of groundwater claimed (in miner's inches or gallons per minute).....

5. If used for irrigation, give the acreage and description of the lands to which water has been applied and name of the owner thereof

6. The means of withdrawing such water from the ground and the location of each well or other means of withdrawal.....

7. The date of commencement and completion of the construction of the well, wells, or other works for withdrawal of groundwater.....

8. The depth of water table.....

9. So far as it may be available, the type, size and depth of each well or the general specifications of any other works for the withdrawal of groundwater.....

10. The estimated amount of groundwater withdrawn each year.....

11. The log of formations encountered in the drilling of each well if available.....

12. Such other information of a similar nature as may be useful in carrying out the policy of this act, including reference to book and page of any county record.....

RESIDENTIAL WELL #2

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site on a topographic map
View hydrograph for this site
View field visits for this site
View water quality for this site

Site Name: STATE OF MONTANA * DRUMMOND WEIGH STATION
GWIC Id: 5933

Section 1: Well Owner(s)

Section 2: Location

Township	Range	Section	Quarter Sections
11N	13W	23	SW¼ SW¼ NE¼ SW¼

County
GRANITE

Geocode

Latitude	Longitude	Geomethod	Datum
46.6918	113.2004	NAV-GPS	NAD27

Ground Surface Altitude	Method	Datum	Date
3900			6/1/2001

Measuring Point Altitude	Method	Datum	Date Applies
3901.7			6/1/2001 2:32:00 PM

Addition **Block** **Lot**

Section 3: Proposed Use of Water
DOMESTIC (1)

Section 4: Type of Work
Drilling Method:

Section 5: Well Completion Date
Date well completed: N/A

Section 6: Well Construction Details
There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
0	0	6				STEEL

There are no completion records assigned to this well.

Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

Total Depth: 25
Static Water Level: 11.84
Water Temperature:

Unknown Test Method *

Yield _ gpm.
Pumping water level _ feet.
Time of recovery _ hours.
Recovery water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source
111SNGR - SAND AND GRAVEL (HOLOCENE)
Lithology Data

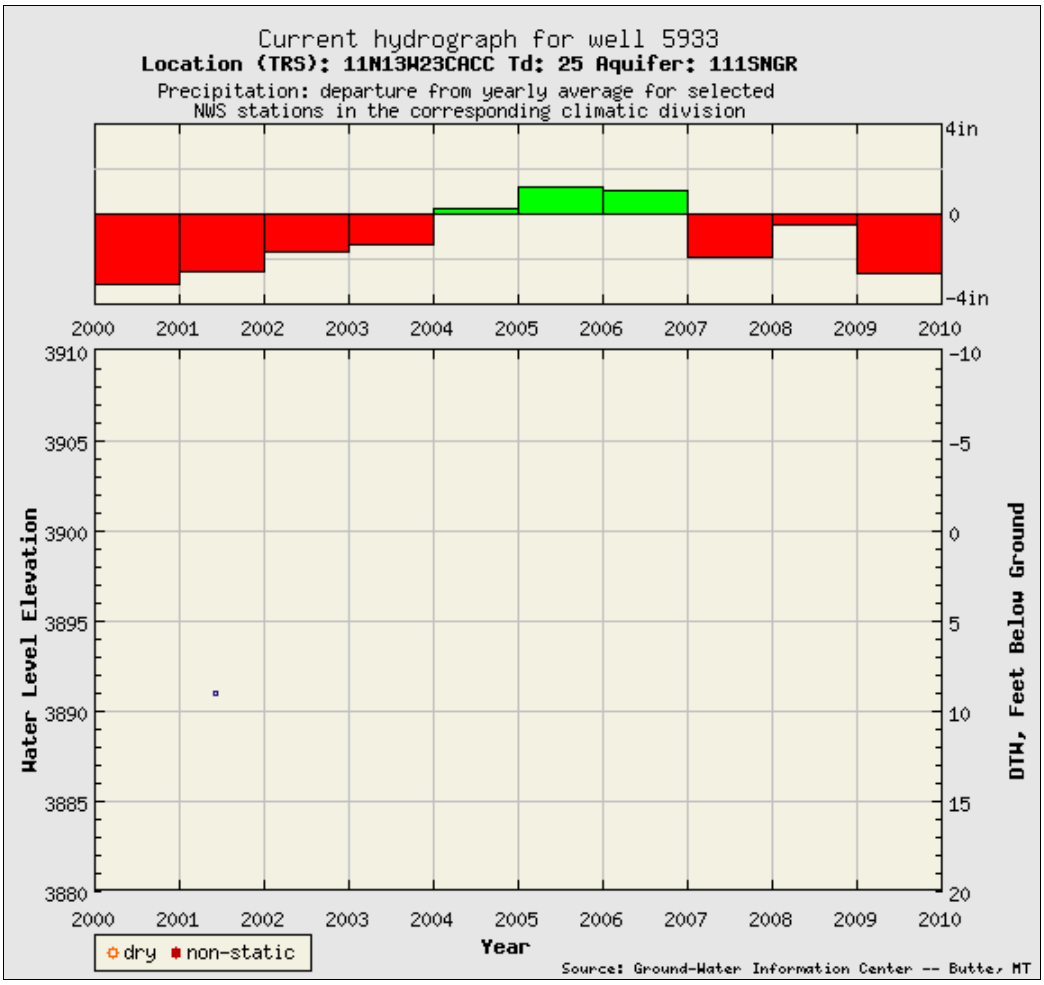
There are no lithologic details assigned to this well.

Driller Certification
All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company:
License No: -
Date Completed:

Groundwater Information Center Well Hydrograph

The following chart represents the current hydrograph for this well. Data reported are in feet below ground surface or feet above mean sea level.



GWIC Id: 5933
Site Name: STATE OF MONTANA * DRUMMOND WEIGH STATION
Location: 11N13W23CACC
Total Depth: 25 feet
Number of Measurements: 1
Period of Record: 6/1/2001 2:32:00 PM - 6/1/2001 2:32:00 PM
Get zipped file of the data used to make this chart
View the one page site summary

The preceding materials represent the contents of the GWIC databases at the Montana Bureau of Mines and Geology at the time and date [Tuesday, February 19, 2013 1:24:04 PM] of the retrieval. The information is considered unpublished and is subject to correction and review on a daily basis. The Bureau warrants the accurate transmission of the data to the original end user at the time and date of the retrieval. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted. There may be wells in the request area that are not recorded at the Information Center.

Ground-Water Information Center Water Quality Report

Site Name: STATE OF MONTANA * DRUMMOND WEIGH STATION

Report Date: 2/19/2013

Compare to Water Quality Standards

Location Information

Sample Id/Site Id:	1987Q0568 / 5933	Sample Date:	7/29/1987 4:00:00 PM
Location (TRS):	11N 13W 23 CACC	Agency/Sampler:	USGS / KAD
Latitude/Longitude:	46° 41' 30" N 113° 12' 1" W	Field Number:	CF-402
Datum:	NAD27	Lab Date:	8/13/1987
Altitude:	3900	Lab/Analyst:	MBMG / WO
County/State:	GRANITE / MT	Sample Method/Handling:	/ 3120
Site Type:	WELL	Procedure Type:	DISSOLVED
Geology:	111SNGR	Total Depth (ft):	25
USGS 7.5' Quad:	DRUMMOND	SWL-MP (ft):	NR
PWS Id:		Depth Water Enters (ft):	NR
Project:	GWCP05		

Major Ion Results

	mg/L	meq/L		mg/L	meq/L
Calcium (Ca)	125.000	6.238	Bicarbonate (HCO3)	215.300	3.529
Magnesium (Mg)	21.300	1.753	Carbonate (CO3)	0.000	0.000
Sodium (Na)	47.000	2.045	Chloride (Cl)	5.000	0.141
Potassium (K)	25.600	0.655	Sulfate (SO4)	350.000	7.291
Iron (Fe)	2.450	0.088	Nitrate (as N)	0.080	0.006
Manganese (Mn)	0.480	0.017	Fluoride (F)	0.100	0.005
Silica (SiO2)	33.700		Orthophosphate (as P)	<.1	0.000
Total Cations		10.960	**Total Anions**		10.971

Trace Element Results (µg/L)

Aluminum (Al):	<30.	Cesium (Cs):	NR	Molybdenum (Mo):	<20.	Strontium (Sr):	6,290.000
Antimony (Sb):	NR	Chromium (Cr):	<2.	Nickel (Ni):	<10.	Thallium (Tl):	NR
Arsenic (As):	6.000	Cobalt (Co):	NR	Niobium (Nb):	NR	Thorium (Th):	NR
Barium (Ba):	NR	Copper (Cu):	<2.	Neodymium (Nd):	NR	Tin (Sn):	NR
Beryllium (Be):	NR	Gallium (Ga):	NR	Palladium (Pd):	NR	Titanium (Ti):	12.000
Boron (B):	210.000	Lanthanum (La):	NR	Praseodymium (Pr):	NR	Tungsten (W):	NR
Bromide (Br):	100.000	Lead (Pb):	<40.	Rubidium (Rb):	NR	Uranium (U):	NR
Cadmium (Cd):	<2.	Lithium (Li):	120.000	Silver (Ag):	<2.	Vanadium (V):	<1.
Cerium (Ce):	NR	Mercury (Hg):	<.04	Selenium (Se):	NR	Zinc (Zn):	77.000
						Zirconium (Zr):	<4.

Field Chemistry and Other Analytical Results

**Total Dissolved Solids (mg/L):	716.29	Field Hardness as CaCO3 (mg/L):	NR	Ammonia (mg/L):	NR
**Sum of Diss. Constituents (mg/L):	825.38	Hardness as CaCO3:	399.8	T.P. Hydrocarbons (µg/L):	NR
Field Conductivity (µmhos):	1013	Field Alkalinity as CaCO3 (mg/L):	185	PCP (µg/L):	NR
Lab Conductivity (µmhos):	1030	Alkalinity as CaCO3 (mg/L):	176.34	Phosphate, TD (mg/L as P):	NR
Field pH:	7.22	Ryznar Stability Index:	6.873	Field Nitrate (mg/L):	NR
Lab pH:	7.44	Sodium Adsorption Ratio:	1.0229	Field Dissolved O2 (mg/L):	0.100
Water Temp (°C):	11	Langlier Saturation Index:	0.283	Field Chloride (mg/L):	NR
Air Temp (°C):	30	Nitrite (mg/L as N):	NR	Field Redox (mV):	NR
Nitrate + Nitrite (mg/L as N)	NR	Hydroxide (mg/L as OH):	NR	Lab, Dissolved Organic Carbon (mg/L):	NR
Total Kjeldahl Nitrogen (mg/L as N)	NR	Lab, Dissolved Inorganic Carbon (mg/L):	NR	Lab, Total Organic Carbon (mg/L):	NR
Total Nitrogen (mg/L as N)	NR	Acidity to 4.5	NR	Acidity to 8.3	NR
As(III) (ug/L)	NR	As(V) (ug/L)	NR		

Alkalinity Fld (CaCO3)	185.000	Bicarbonate Field (Hco3)	226.000	Oxygen Dis Field(mg/L-O)	0.100	**Additional Parameters**
Phosphate T Dis (mg/L - P)	L.1					

Notes

Sample Condition: BROWN SEDIMENT * SLIGHT SULFIDE ODOR * NO BUBBLES *

Field Remarks: SAMPLED THRU SAMPLING CHAMBER*IRON TOTAL >2.0 MG/L* IRON FERROUS 1.5 MG/L* SULFIDE .06 MG/L

Lab Remarks: ARSENIC AS AS+3 = 1.6

Explanation: **mg/L** = milligrams per Liter; **µg/L** = micrograms per Liter; **ft** = feet; **NR** = No Reading in GWIC

Qualifiers: **A** = Hydride atomic absorption; **E** = Estimated due to interference; **H** = Exceeded holding time; **J** = Estimated quantity above detection limit but below reporting limit; **K** = Na+K combined; **N** = Spiked sample recovery not within control limits; **P** = Preserved sample; **S** = Method of standard additions; **U** = Undetected quantity below detection limit; ***** = Duplicate analysis not within control limits; ****** = Sum of Dissolved Constituents is the sum of major cations (Na, Ca, K, Mg, Mn, Fe) and anions (HCO3, CO3, SO4, Cl, SiO2, NO3, F) in mg/L. Total Dissolved Solids is reported as equivalent weight of evaporation residue.

Disclaimer

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RESIDENTIAL WELL #3

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site on a topographic map
View hydrograph for this site
View field visits for this site
View scanned well log (1/27/2009 5:09:23 PM)

Site Name: HOLLAND SHELLEY & JC
GWIC Id: 149012

Section 1: Well Owner(s)

1) HOLLAND, J.C. (MAIL)
FRONTAGE RD. WEST
DRUMMOND MT 59832 [05/21/2001]
2) HOLLAND, SHELLEY/J.C. (MAIL)
BOX 452
DRUMMOND MT 59832 [03/30/1995]

Section 2: Location

Township	Range	Section	Quarter Sections
11N	13W	23	NE¼ SW¼ SW¼ SE¼

County: GRANITE
Geocode:

Latitude	Longitude	Geomethod	Datum
46.6896	113.1939	NAV-GPS	NAD27

Ground Surface Altitude	Method	Datum	Date
3910			5/21/2001

Measuring Point Altitude	Method	Datum	Date Applies
3912.9			5/21/2001 5:02:00 PM

Addition **Block** **Lot**

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: ROTARY

Section 5: Well Completion Date

Date well completed: Thursday, March 30, 1995

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	80	6				STEEL
10	150	4				PVC

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
0	0	4		1/8X4	SAW SLOTS

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	18	BENTONITE	

Section 7: Well Test Data

Total Depth: 150
Static Water Level:
Water Temperature:

Air Test *

30 gpm with drill stem set at _ feet for 1 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 130 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

IDENTICAL CHEMISTRY TO M#160370(112SNGR).

Section 9: Well Log

Geologic Source

217KOTN - KOOTENAI FORMATION

From	To	Description
0	1	TOPSOIL
1	15	DIRT & ROCK
15	50	SHALE
50	51	ROCK
51	105	CLAY & SHALE LAYERS
105	150	ROCK

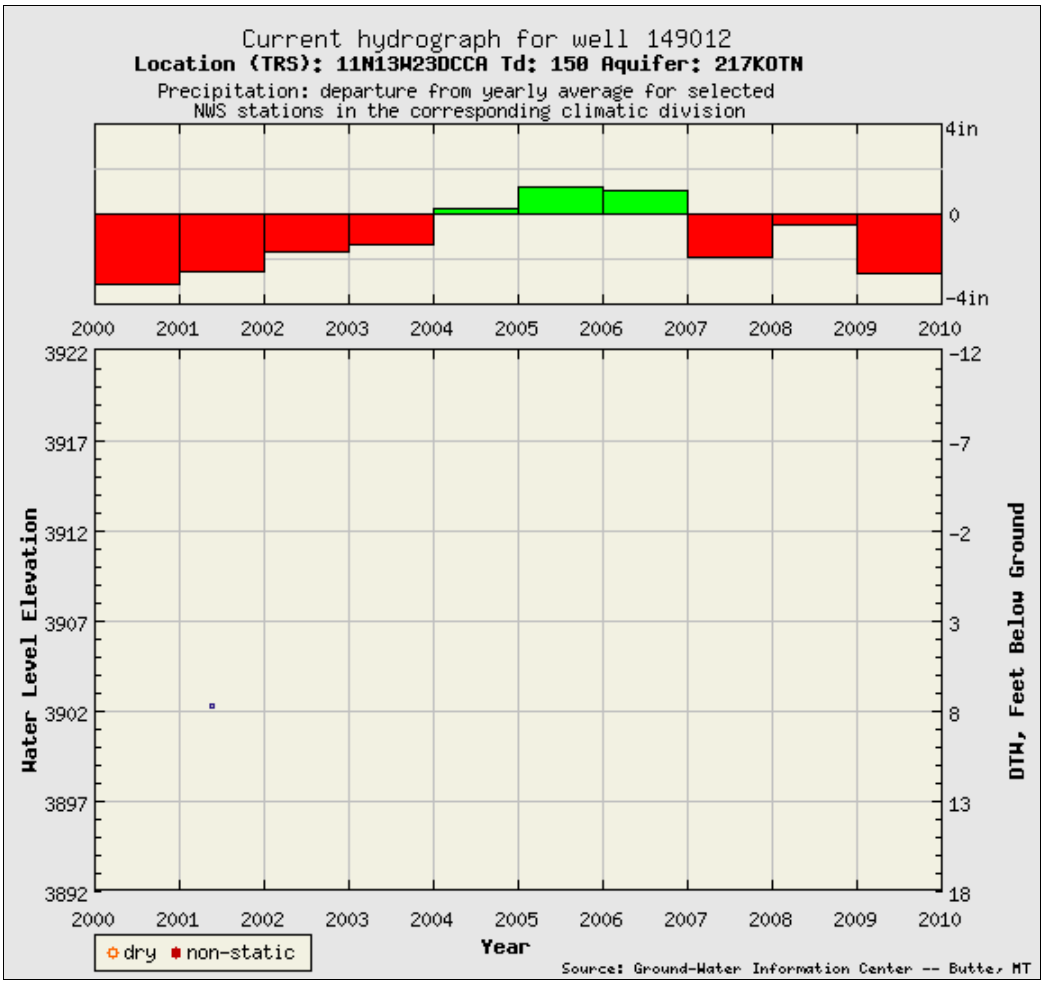
Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: BRAZILL DRILLING
License No: WWC-355
Date Completed: 3/30/1995

Groundwater Information Center Well Hydrograph

The following chart represents the current hydrograph for this well. Data reported are in feet below ground surface or feet above mean sea level.



GWIC Id: 149012
Site Name: HOLLAND SHELLEY & JC
Location: 11N13W23DCCA
Total Depth: 150 feet
Number of Measurements: 1
Period of Record: 5/21/2001 5:02:00 PM - 5/21/2001 5:02:00 PM
Get zipped file of the data used to make this chart
View the one page site summary

The preceding materials represent the contents of the GWIC databases at the Montana Bureau of Mines and Geology at the time and date [Tuesday, February 19, 2013 1:28:32 PM] of the retrieval. The information is considered unpublished and is subject to correction and review on a daily basis. The Bureau warrants the accurate transmission of the data to the original end user at the time and date of the retrieval. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted. There may be wells in the request area that are not recorded at the Information Center.

RESIDENTIAL WELL #4

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site on a topographic map
View hydrograph for this site
View field visits for this site
View scanned well log (1/27/2009 5:09:16 PM)

Site Name: GOOD TIME CAMPING AND RV PARK
GWIC Id: 160370
DNRC Water Right: 102044

Section 1: Well Owner(s)

1) GOOD TIME CAMPING AND RV PARK (MAIL)
239 FRONTAGE RD.
DRUMMOND MT 59832 [05/21/2001]

Section 2: Location

Township	Range	Section	Quarter Sections
11N	13W	23	NW¼ SW¼ SW¼ SE¼

County
GRANITE

Geocode

Latitude	Longitude	Geomethod	Datum
46.6891	113.1956	NAV-GPS	NAD27

Ground Surface Altitude	Method	Datum	Date
3900			5/21/2001

Measuring Point Altitude	Method	Datum	Date Applies
3902.2			5/21/2001 5:58:00 PM

Addition **Block** **Lot**

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: ROTARY

Section 5: Well Completion Date

Date well completed: Thursday, March 27, 1997

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	60	6				STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
27	32	6			3/16X1

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	0	BENTONITE	

Section 7: Well Test Data

Total Depth: 60
Static Water Level: 4
Water Temperature:

Air Test *

30 gpm with drill stem set at _ feet for 1 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

JEROMES FILE NO: 6625

Section 9: Well Log

Geologic Source

111SNGR - SAND AND GRAVEL (HOLOCENE)

From	To	Description
0	4	SOIL
4	32	SAND AND GRAVEL WITH WATER
32	60	CLAY

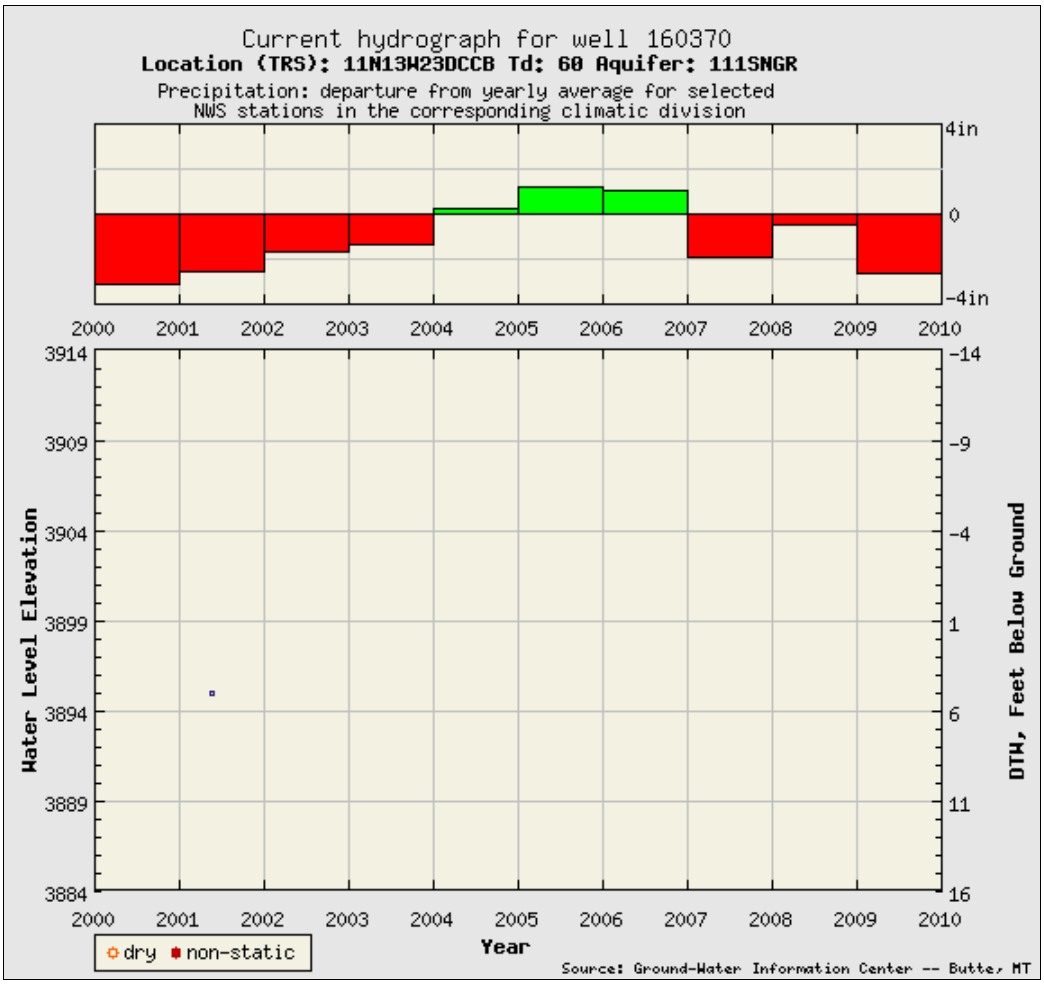
Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: JEROMES DRILLING CO
License No: WWC-249
Date Completed: 3/27/1997

Groundwater Information Center Well Hydrograph

The following chart represents the current hydrograph for this well. Data reported are in feet below ground surface or feet above mean sea level.



GWIC Id: 160370
Site Name: GOOD TIME CAMPING AND RV PARK
Location: 11N13W23DCCB
Total Depth: 60 feet
Number of Measurements: 1
Period of Record: 5/21/2001 5:58:00 PM - 5/21/2001 5:58:00 PM
Get zipped file of the data used to make this chart
View the one page site summary

The preceding materials represent the contents of the GWIC databases at the Montana Bureau of Mines and Geology at the time and date [Tuesday, February 19, 2013 1:31:13 PM] of the retrieval. The information is considered unpublished and is subject to correction and review on a daily basis. The Bureau warrants the accurate transmission of the data to the original end user at the time and date of the retrieval. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted. There may be wells in the request area that are not recorded at the Information Center.

RESIDENTIAL WELL #5

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site on a topographic map
View scanned well log (1/27/2009 5:09:44 PM)

Site Name: LUND BOB
GWIC Id: 204657

Section 1: Well Owner(s)
1) LUND, BOB (MAIL)
100 COW CREEK ROAD
HALL MT 59837 [06/23/2003]

Section 2: Location

Township	Range	Section	Quarter Sections
11N	13W	26	NE¼

County	Geocode
GRANITE	46198212301010000

Latitude	Longitude	Geomethod	Datum
46.683513	113.191443	TRS-SEC	NAD83

Ground Surface Altitude	Method	Datum	Date

Addition	Block	Lot

Section 3: Proposed Use of Water
DOMESTIC (1)

Section 4: Type of Work
Drilling Method: ROTARY

Section 5: Well Completion Date
Date well completed: Monday, June 23, 2003

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	18	8
18	130	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	18	6			WELDED	STEEL
10	130	4			WELDED	PVC

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
110	130	4	54	1/8X6IN	SAW SLOTS

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	18	GROUT	

Section 7: Well Test Data

Total Depth: 130
Static Water Level: 70
Water Temperature:

Air Test *

10 gpm with drill stem set at 128 feet for 1 hours.
Time of recovery 0.13 hours.
Recovery water level 70 feet.
Pumping water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log
Geologic Source
330MDSN - MADISON GROUP OR LIMESTONE

From	To	Description
0	2	TOPSOIL
2	50	YELLOW SHELL
50	130	LIMESTONE

Driller Certification
All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: OKEEFE DRILLING CO
License No: WWD-90
Date Completed: 6/23/2003

RESIDENTIAL WELL #6

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site on a topographic map
View scanned well log (1/27/2009 5:09:37 PM)

Site Name: LEMM EVERETT
GWIC Id: 65894

Section 1: Well Owner(s)
1) LEMM, EVERETT (MAIL)

DRUMMOND MT 59832 [12/13/1967]

Section 2: Location

Township	Range	Section	Quarter Sections
11N	13W	26	NE¼

County
GRANITE

Geocode

Latitude	Longitude	Geomethod	Datum
46.683513	113.191443	TRS-SEC	NAD83

Ground Surface Altitude	Method	Datum	Date
3960			

Addition	Block	Lot

Section 3: Proposed Use of Water
DOMESTIC (1)
IRRIGATION (2)

Section 4: Type of Work
Drilling Method: AIR ROTARY

Section 5: Well Completion Date
Date well completed: Wednesday, December 13, 1967

Section 6: Well Construction Details
There are no borehole dimensions assigned to this well.
Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-1.5	49	6				

There are no completion records assigned to this well.
Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

Total Depth: 190
Static Water Level: 35
Water Temperature:

Air Test *

20 gpm with drill stem set at _ feet for 4 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 160 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log
Geologic Source
330MDSN - MADISON GROUP OR LIMESTONE

From	To	Description
0	8	BADLY FRACTURED SHALE ROCK
8	62	DARK GREEN BROWN ARGILLITE
62	126	DARK GRAY ARGILLITE
126	128	BROWN ARGILLITE
128	164	DARK GRAY ARGILLITE
164	167	BROWN ARGILLITE
167	190	LIGHT GRAY LIMESTONE

Driller Certification
All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: LIBERTY DRILLING & PUMP CO
License No: WWC-52
Date Completed: 12/13/1967

RESIDENTIAL WELL #7

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site on a topographic map
View scanned well log (1/27/2009 5:09:30 PM)

Site Name: SMITH HAROLD
GWIC Id: 65893

Section 1: Well Owner(s)
1) SMITH, HAROLD (MAIL)

DRUMMOND MT 59832 [01/01/1900]

Section 2: Location

Township	Range	Section	Quarter Sections
11N	13W	25	NW¼ SE¼

County GRANITE **Geocode**

Latitude	Longitude	Geomethod	Datum
46.678112	113.173117	TRS-SEC	NAD83

Ground Surface Altitude **Method** **Datum** **Date**

Addition **Block** **Lot**

Section 3: Proposed Use of Water
DOMESTIC (1)
STOCKWATER (2)

Section 4: Type of Work
Drilling Method:

Section 5: Well Completion Date
Date well completed: Monday, January 01, 1900

Section 6: Well Construction Details
There are no borehole dimensions assigned to this well.
There are no casing strings assigned to this well.
There are no completion records assigned to this well.
Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

Total Depth: 12
Static Water Level: 12
Water Temperature:

Unknown Test Method *

Yield 200 gpm.
Pumping water level _ feet.
Time of recovery _ hours.
Recovery water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log
Geologic Source
110UDFD - QUATERNARY UNDIFFERENTIATED
Lithology Data

There are no lithologic details assigned to this well.

Driller Certification
All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company:
License No: -
Date Completed: 1/1/1900

RESIDENTIAL WELL#8

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site on a topographic map
View hydrograph for this site
View field visits for this site

Site Name: BENSON NEIL
GWIC Id: 191288
DNRC Water Right:

Section 1: Well Owner(s)

1) BENSON, NIEL (MAIL)
75 AIRPORT ROAD
DRUMMOND MT 59832 [09/12/2001]

Section 2: Location

Township	Range	Section	Quarter Sections
11N	13W	34	SE¼ SE¼ NW¼ NW¼

County	Geocode
GRANITE	

Latitude	Longitude	Geomethod	Datum
46.6701	113.2228	NAV-GPS	NAD27

Ground Surface Altitude	Method	Datum	Date
4435			9/12/2001

Measuring Point Altitude	Method	Datum	Date Applies
4435			9/12/2001 11:10:00 AM

Addition	Block	Lot

Section 3: Proposed Use of Water

UNUSED (1)

Section 4: Type of Work

Drilling Method: Unassigned

Section 5: Well Completion Date

Date well completed: Unknown

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.
There are no casing strings assigned to this well.
There are no completion records assigned to this well.

Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

There are no well test data details assigned to this well.

Section 9: Well Log

Geologic Source

120VLCC - VOLCANICS (TERTIARY)

Lithology Data

There are no lithologic details assigned to this well.

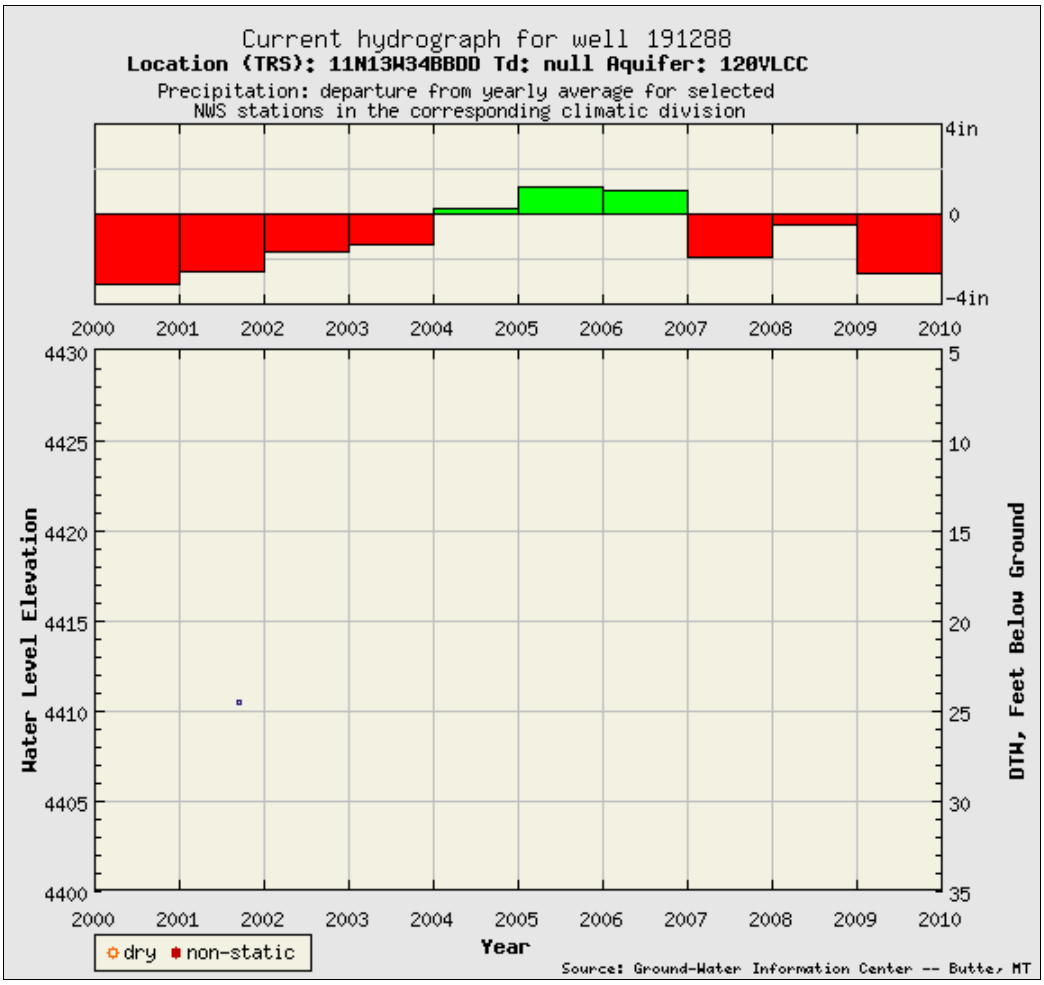
Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

There is no certification data for this well.

Groundwater Information Center Well Hydrograph

The following chart represents the current hydrograph for this well. Data reported are in feet below ground surface or feet above mean sea level.



GWIC Id: 191288
Site Name: BENSON NEIL
Location: 11N13W34BBDD
Total Depth: feet
Number of Measurements: 1
Period of Record: 9/12/2001 11:10:00 AM - 9/12/2001 11:10:00 AM
Get zipped file of the data used to make this chart
View the one page site summary

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RESIDENTIAL WELL #9

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site on a topographic map

Site Name: MOODY CHARLIE
GWIC Id: 255695

Section 1: Well Owner(s)

1) MOODRY, CHARLIE (MAIL)
84 LORENSEN LANE
DRUMMOND MT 59832 [05/03/2010]

Section 2: Location

Township	Range	Section	Quarter Sections
11N	13W	36	SE¼ NW¼

County GRANITE

Geocode

Latitude	Longitude	Geomethod	Datum
46.66375	113.172444	NAV-GPS	WGS84

Ground Surface Altitude **Method** **Datum** **Date**

Addition **Block** **Lot**

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: CABLE TOOL

Section 5: Well Completion Date

Date well completed: Monday, May 03, 2010

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	65	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	48	6	0.25		WELDED	A53B STEEL
43	65	4			THREADED	PVC-SCHED 40

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
55	65	4	18	1/8 X 6	SAW SLOTS

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	18	BENTONITE	Y

Section 7: Well Test Data

Total Depth: 65
Static Water Level: 20
Water Temperature:

Bailer Test *

20 gpm with 40 feet of drawdown after 1 hours.
Time of recovery 1 hours.
Recovery water level 20 feet.
Pumping water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

CASING IS OPEN SEEPAGE/FIRST WATER @ 48'

Section 9: Well Log

Geologic Source

Unassigned

From	To	Description
0	8	SANDY CLAY
8	18	COBBLES & GRAVELS
18	25	BROWN CLAY & SAND
25	48	GREEN SANDY CLAY
48	65	BLUE-GREEN SHALE W/WATER

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name: DAN OKEEFE
Company: OKEEFE DRILLING CO
License No: WWC-462
Date Completed: 5/3/2010

Hydrometrics, Inc.

Consulting Scientists and Engineers
Helena, Montana

Monitor Well Log

Hole Name: Ranch House Well

Date Hole Started: 7/3/2014 Date Hole Finished: 7/7/2014

Client: Montana Limestone Resources
Project: Montana Limestone Resources
County: Granite State: Montana
Property Owner: Washington Limestone Resources
Legal Description: T11N, R13W, 26 BD
Location Description: North of Ranch House

Recorded By: Larry Johnson
Drilling Company: O'Keefe
Driller: Larry Gagnon
Drilling Method: Dual Rotary
Drilling Fluids Used: Air/Water
Purpose of Hole: Piezometer
Target Aquifer: First Water
Hole Diameter (in): 8"
Total Depth Drilled (ft): 300

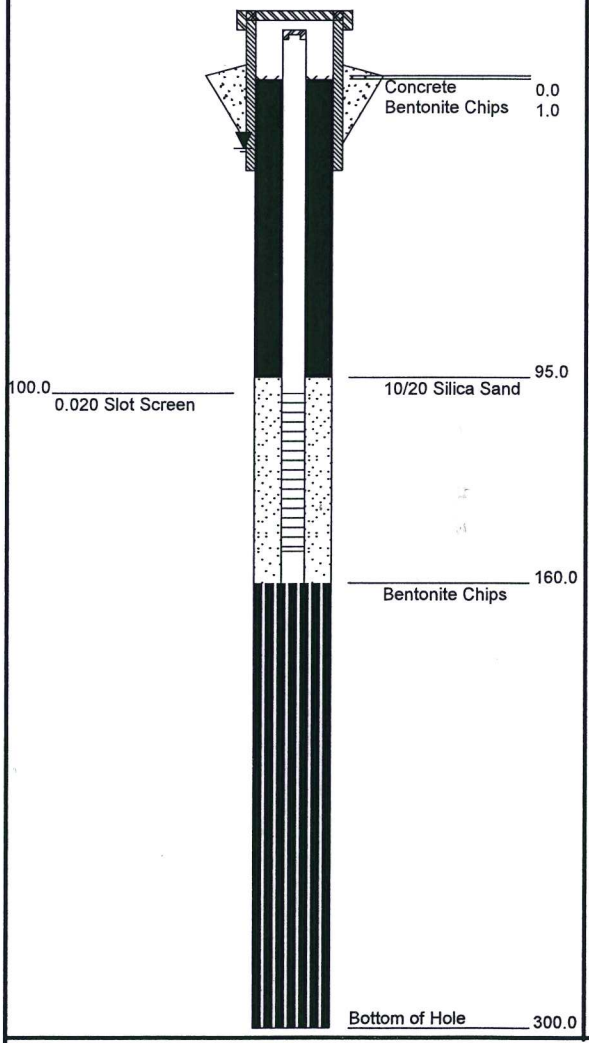
WELL COMPLETION	Y/N	DESCRIPTION	INTERVAL
Well Installed?	Y	2-inch, flush threaded, Sch 40, PVC	0-160
Surface Casing Used?	Y	8" Steel	
Screen/Perforations?	Y	0.020-inch slot, Sch 40 PVC	100 - 160'
Sand Pack?	Y	10/20 Sand	95 - 160'
Annular Seal?	Y	Bentonite Chips	0 - 95'
Surface Seal?	Y	Concrete	0 - 2'
DEVELOPMENT/SAMPLING			
Well Developed?	N		
Water Samples Taken?	N		
Boring Samples Taken?	Y	Drill Cutting	

RESIDENTIAL WELL #10

Northing: 46.663 Easting: 113.1724
Static Water Level Below MP: 25.33
Date: 8/26/14
MP Description: Top of PVC
MP Height Above or Below Ground (ft): 2.5
Surface Casing Height (ft): 2.5'
Riser Height (ft): 2.5'
Ground Surface Elevation (ft): 3955
MP Elevation (ft): 3957.56

Remarks: Well initially drilled for domestic use but insufficient yield so converted to piezometer. Less than 5 gpm at 300 feet total depth. Backfilled with bentonite to 160 feet and completed piezometer 100 to 160 feet for water level monitoring.

WELL CONSTRUCTION



SAMPLE NOTES

GRAPHICS

GEOLOGICAL DESCRIPTION

0.0 - 3.0' **Sandy Silt**
Dry, damp, dark brown.

40.0 - 100.0' **Mudstone**
Medium to dark gray. Damp.

100.0 - 200.0' **Mudstone**
Dark gray, minor amounts of fine grained sand. Moist.

200.0 - 230.0' **Mudstone**
Predominantly gray mudstone with some fine grained sand. Damp.

230.0 - 300.0' **Mudstone**
Dark gray. Damp.

STANDARD_REV4 K:\GINT\PROJECTS\13027.GPJ HYDHLN2.GDT 2/12/15

RESIDENTIAL WELL #11

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site on a topographic map
View scanned well log (1/27/2009 5:12:37 PM)

Site Name: LORENSEN KEVIN
GWIC Id: 65896

Section 1: Well Owner(s)

1) LORENSEN, KEVIN (MAIL)
BOX 95
DRUMMOND MT 59832 [04/20/1987]

Section 2: Location

Township	Range	Section	Quarter Sections
11N	13W	36	SE¼

County
GRANITE

Geocode

Latitude	Longitude	Geomethod	Datum
46.661876	113.170463	TRS-SEC	NAD83

Ground Surface Altitude	Method	Datum	Date

Addition	Block	Lot

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: FORWARD ROTARY

Section 5: Well Completion Date

Date well completed: Monday, April 20, 1987

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	60	6				STEEL
10	120	4				PVC

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
90	110	4			

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	20	BENTONITE	

Section 7: Well Test Data

Total Depth: 120
Static Water Level: 47
Water Temperature:

Air Test *

7 gpm with drill stem set at _ feet for 5 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 49 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

JEROMES FILE NO: 1859

Section 9: Well Log

Geologic Source

120SICL - TERTIARY SILT AND CLAY

From	To	Description
0	2	SOIL
2	8	CLAY & GRAVEL BITS
8	15	GRAVEL & BOULDERS
15	70	YELLOW SHALE
70	100	GRAY SHALE
100	120	GRAY SHALE & WATER

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: JEROMES DRILLING CO
License No: WWC-249
Date Completed: 4/20/1987

RESIDENTIAL WELL #12

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site on a topographic map
View hydrograph for this site
View field visits for this site
View scanned well log (1/27/2009 5:12:22 PM)

Site Name: STEM ROBERT W AND BARBARA L
GWIC Id: 160374

Section 1: Well Owner(s)

1) STEM, ROBERT/BARBARA (MAIL)
PO BOX 234
DRUMMOND MT 59832 [11/07/2001]
2) STEM, ROBERT/BARBARA (MAIL)
711 CARTER
DEER LODGE MT 59722 [02/12/1997]

Section 2: Location

Township	Range	Section	Quarter Sections
11N	13W	33	SW¼ NE¼ NE¼ SW¼

County
GRANITE

Geocode

Latitude	Longitude	Geomethod	Datum
46.6646	113.2386	NAV-GPS	NAD27

Ground Surface Altitude	Method	Datum	Date
4645			11/7/2001

Measuring Point Altitude	Method	Datum	Date Applies
4646			11/7/2001 3:31:00 PM

Addition	Block	Lot

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: ROTARY

Section 5: Well Completion Date

Date well completed: Wednesday, February 12, 1997

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	18	6				STEEL
6	106	4				PVC

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
66	106	4			2X.02FACTORY

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	18	BENTONITE	

Section 7: Well Test Data

Total Depth: 106
Static Water Level: 60
Water Temperature:

Air Test *

30 gpm with drill stem set at _ feet for 1 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 85 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

370CMBR - CAMBRIAN UNDIFFERENTIATED

From	To	Description
0	1	TOPSOIL
1	11	CLAY
11	30	SHALE
30	33	CLAY
33	77	SHALE
77	106	FRACTURED SHALE WITH CLAY SEAMS

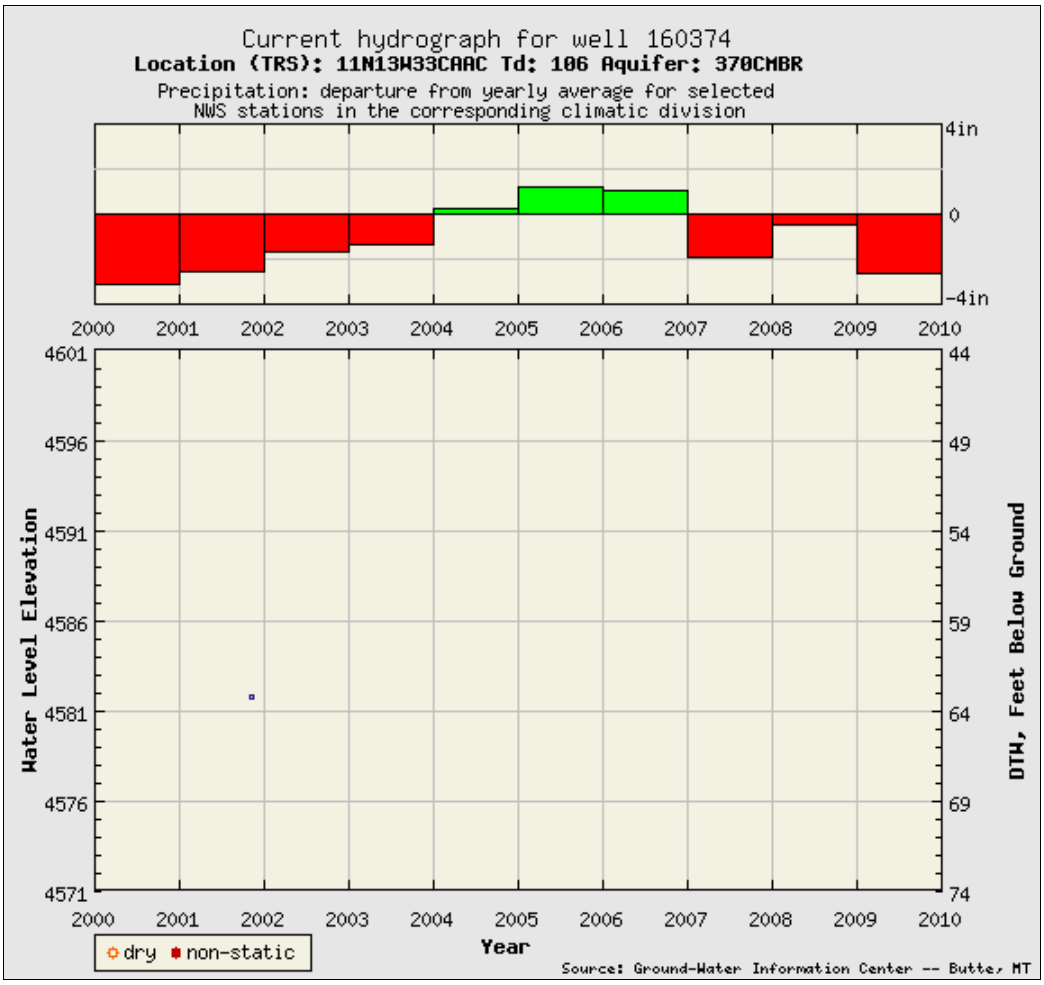
Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: H & L DRILLING INC
License No: WWC-447
Date Completed: 2/12/1997

Groundwater Information Center Well Hydrograph

The following chart represents the current hydrograph for this well. Data reported are in feet below ground surface or feet above mean sea level.



GWIC Id: 160374
Site Name: STEM ROBERT W AND BARBARA L
Location: 11N13W33CAAC
Total Depth: 106 feet
Number of Measurements: 1
Period of Record: 11/7/2001 3:31:00 PM - 11/7/2001 3:31:00 PM
Get zipped file of the data used to make this chart
View the one page site summary

The preceding materials represent the contents of the GWIC databases at the Montana Bureau of Mines and Geology at the time and date [Tuesday, February 19, 2013 1:38:09 PM] of the retrieval. The information is considered unpublished and is subject to correction and review on a daily basis. The Bureau warrants the accurate transmission of the data to the original end user at the time and date of the retrieval. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted. There may be wells in the request area that are not recorded at the Information Center.

RESIDENTIAL WELL #13

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site on a topographic map
View hydrograph for this site
View field visits for this site
View scanned well log (1/27/2009 5:12:30 PM)

Site Name: STEM ROBERT AND BARBARA
GWIC Id: 65895

Section 1: Well Owner(s)

1) STEM, ROBERT/BARBARA (MAIL)
PO BOX 234
DRUMMOND MT 59832 [11/07/2001]
2) LORENSEN, RAY (MAIL)

DRUMMOND MT 59832 [08/15/1980]

Section 2: Location

Township	Range	Section	Quarter Sections
11N	13W	33	SE¼ SE¼ SE¼ SW¼

County: GRANITE
Geocode:

Latitude	Longitude	Geomethod	Datum
46.6593	113.239	NAV-GPS	NAD27

Ground Surface Altitude	Method	Datum	Date
4590			11/7/2001

Measuring Point Altitude	Method	Datum	Date Applies
4591.9			11/7/2001 2:57:00 PM

Addition **Block** **Lot**

Section 3: Proposed Use of Water

UNUSED (1)

Section 4: Type of Work

Drilling Method: FORWARD ROTARY

Section 5: Well Completion Date

Date well completed: Friday, August 15, 1980

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
0	40	6				STEEL
30	110	4				PVC

There are no completion records assigned to this well.

Annular Space (Seal/Grout/Packer)

There are no annular space records assigned to this well.

Section 7: Well Test Data

Total Depth: 110
Static Water Level: 8
Water Temperature:

Air Test *

15 gpm with drill stem set at _ feet for 0.5 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 35 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

120VLCC - VOLCANICS (TERTIARY)

From	To	Description
0	20	TOPSOIL
20	40	CLAY
40	110	VOLCANIC ROCK

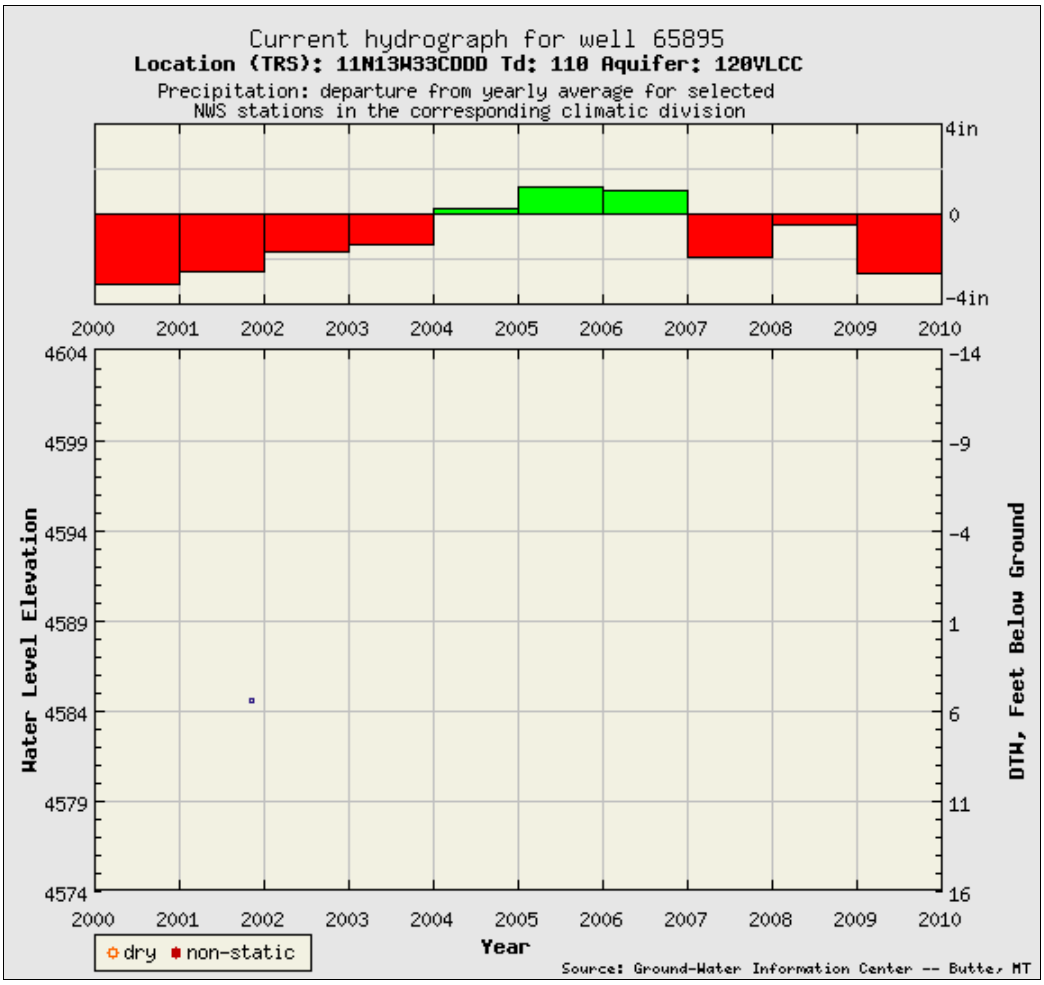
Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: BRAZILL DRILLING
License No: WWC-355
Date Completed: 8/15/1980

Groundwater Information Center Well Hydrograph

The following chart represents the current hydrograph for this well. Data reported are in feet below ground surface or feet above mean sea level.



GWIC Id: 65895
Site Name: STEM ROBERT AND BARBARA
Location: 11N13W33CDDD
Total Depth: 110 feet
Number of Measurements: 1
Period of Record: 11/7/2001 2:57:00 PM - 11/7/2001 2:57:00 PM
Get zipped file of the data used to make this chart
View the one page site summary

The preceding materials represent the contents of the GWIC databases at the Montana Bureau of Mines and Geology at the time and date [Tuesday, February 19, 2013 1:39:41 PM] of the retrieval. The information is considered unpublished and is subject to correction and review on a daily basis. The Bureau warrants the accurate transmission of the data to the original end user at the time and date of the retrieval. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted. There may be wells in the request area that are not recorded at the Information Center.

RESIDENTIAL WELL #14

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site on a topographic map
View hydrograph for this site
View field visits for this site

Site Name: MENTZER CALVIN
GWIC Id: 63231
DNRC Water Right: 65854

Section 1: Well Owner(s)

1) MENTZER, CALVIN (MAIL)
BOX 372
DRUMMOND MT 59832 [06/22/1987]

Section 2: Location

Township	Range	Section	Quarter Sections
10N	13W	2	NE¼ NE¼ SW¼ SW¼

County GRANITE

Geocode

Latitude	Longitude	Geomethod	Datum
46.6475	113.2004	NAV-GPS	NAD27

Ground Surface Altitude	Method	Datum	Date
4110			8/21/2001

Measuring Point Altitude	Method	Datum	Date Applies
4112.1			10/19/1994

Addition **Block** **Lot**

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method: FORWARD ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Monday, June 22, 1987

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2.2	38.2	6				STEEL
20	60	5				STEEL

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
40	60	5		1/8X2	TORCH CUTS

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	20	BENTONITE	

Section 7: Well Test Data

Total Depth: 60
Static Water Level: 19
Water Temperature:

Air Test *

_75_ gpm with drill stem set at _ feet for _1_ hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level _60_ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

217SDMS - SEDIMENTS (LOWER CRETACEOUS)

From	To	Description
0	19	CLAY
19	26	CLAY & GRAVEL
26	43	TAN SHALE & WATER
43	46	GREEN SHALE & WATER
46	51	BLACK SHALE & WATER
51	60	TAN SHALE & WATER

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: CAMP WELL DRILLING
License No: WWC-7
Date Completed: 6/22/1987

RESIDENTIAL WELL #15

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Other Options

Return to menu
Plot this site on a topographic map
View hydrograph for this site
View field visits for this site
View scanned well log (6/17/2009 10:18:56 AM)

Site Name: BAKER ALVIN
GWIC Id: 127478
DNRC Water Right: 81479

Section 1: Well Owner(s)

1) BAKER, ALVIN (MAIL)
BOX 307
DRUMMOND MT 59832 [04/02/1992]

Section 2: Location

Township	Range	Section	Quarter Sections
10N	13W	2	SW¼ SW¼ SW¼ SE¼

County
GRANITE

Geocode

Latitude	Longitude	Geomethod	Datum
46.644135	113.195957	TRS-SEC	NAD83

Ground Surface Altitude	Method	Datum	Date
4200			

Measuring Point Altitude	Method	Datum	Date Applies
4201.8			10/18/1994

Addition	Block	Lot

Section 3: Proposed Use of Water

DOMESTIC (1)

Section 4: Type of Work

Drilling Method:
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Thursday, April 02, 1992

Section 6: Well Construction Details

There are no borehole dimensions assigned to this well.

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2	100	6				STEEL
105	95	4				PVC

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
100	105	4		1/8X4	SAW SLOTS

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	18	BENTONITE	

Section 7: Well Test Data

Total Depth: 105
Static Water Level: 55
Water Temperature:

Air Test *

12 gpm with drill stem set at _ feet for 2 hours.
Time of recovery _ hours.
Recovery water level _ feet.
Pumping water level 74 feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

Section 9: Well Log

Geologic Source

370CMBR - CAMBRIAN UNDIFFERENTIATED

From	To	Description
0	8	TOPSOIL
8	18	GRAVEL
18	70	BROWN CLAY
70	90	BLUE CLAY
90	105	DECOMPOSED ROCK

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: BRAZILL DRILLING
License No: WWC-355
Date Completed: 4/2/1992

APPENDIX D

BASELINE GROUNDWATER MONITORING DATA

MANUAL GROUNDWATER LEVEL MONITORING DATA
MONTANA LIMESTONE RESOURCES PROJECT

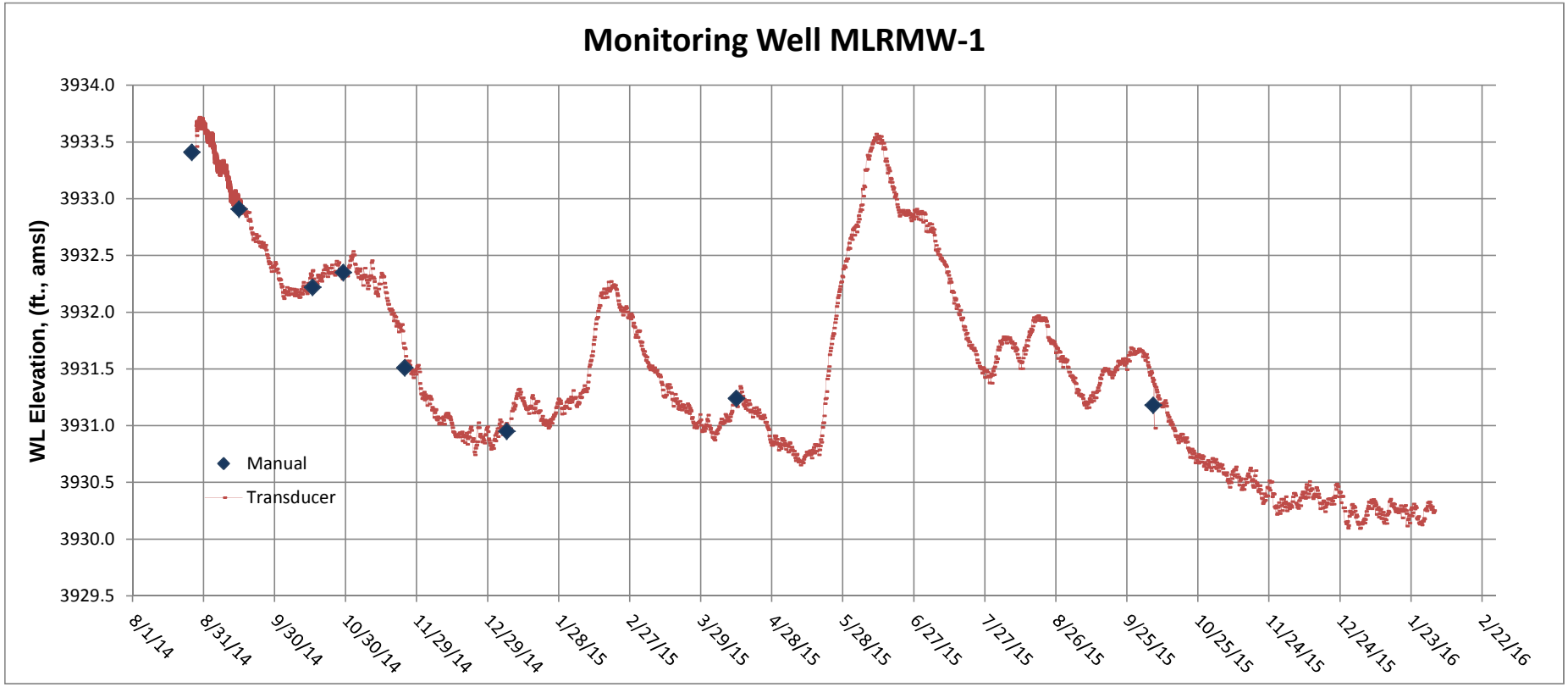
WELL	Screen Interval	Depth to Groundwater - feet from top of well casing																			
		5/20/14	6/18/14	6/30/14	7/14/14	7/28/14	8/11/14	8/19/14	8/26/14	9/15/14	10/16/14	10/29/14	11/24/14	1/6/15	4/14/15	7/1/15	7/31/15	10/6/15	Min	Max	Mean
MLR MW-1 (Cretaceous)	95-125	nm	nm	24.63	25.11	26.19	25.35	25.3	27.29	27.79	28.48	28.40	29.19	29.75	29.46	27.97	nm	29.52	24.63	29.75	27.42
MLR MW-2 (Madison)	480-600	nm	494.00	494.72	495.25	495.82	495.22	496.03	496.14	nm	496.14	496.46	496.82	496.97	nm	497.38	497.85	498.40	494.72	497.85	496.13
MLR MW-3D (Creatceous)	58-98	85.60	nm	80.81	51.71	38.58	34.1	34.22	31.28	43.74	30.59	29.22	36.20	28.50	27.96	28.52	nm	27.80	27.8	80.81	38.05
MLR MW-3S (Alluvium/Colluvium)	20.5-30.5	25.50	nm	23.45	25.32	25.38	25.7	25.7	25.34	24.92	25.16	25.18	25.32	25.22	24.96	25.10	nm	25.35	23.45	25.7	25.15
MLR MW-4 (CFR Alluvium)	7.5-17.5	nm	nm	8.7	10.65	10.98	11.38	11.04	10.29	9.38	9.61	9.58	9.84	9.50	9.16	9.8	nm	9.81	8.7	11.38	9.99
MLR MW-5 (CFR Alluvium)	8-18	nm	nm	8.53	10.36	10.48	10.97	11.41	9.95	9.84	10.14	10.15	10.64	9.57	9.68	10.57	nm	10.44	8.53	11.41	10.17
B-2 (Tertiary)	40-50	nm	nm	23.14	23.15	23.18	23.22	23.1	23.27	nm	23.24	23.29	nm	23.41	23.14	23.12	23.15	23.33	23.1	23.41	23.22
B-3 (Tertiary)	20-30	nm	nm	16.4	16.25	16.18	16.12	16.07	16.15	nm	16.48	16.64	nm	17.13	16.67	17.05	17.20	17.68	16.07	17.2	16.46
B-4 (Tertiary)	22-32	nm	nm	21.02	21.28	21.50	21.60	21.65	21.72	nm	nm	21.89	nm	22.07	21.25	21.74	21.82	22.08	21.02	22.07	21.62
B-6 (Tertiary)	22-32	nm	nm	25.23	25.26	25.31	25.38	25.31	25.48	nm	25.61	25.77	nm	26.16	25.61	25.97	26.16	26.59	25.23	26.16	25.57
Homestead Well 1 (Tertiary)	NA	nm	nm	28.70	nm	nm	nm	nm	29.10	nm	29.37	29.41	nm	29.25	28.82	29.46	nm	29.87	28.7	29.87	29.25
Homestead Well 2 (Tertiary)	NA	nm	nm	nm	nm	nm	nm	nm	51.90	nm	51.75	51.75	nm	nm	nm	nm	nm	nm	51.75	51.9	51.80
Ranch House Well (Tertirary)	100-160	nm	nm	nm	nm	nm	nm	nm	25.33	nm	26.15	26.23	nm	24.66	nm	nm	nm	nm	24.66	26.23	25.59
MLRPZ-37	320-349	nm	nm	Dry	nm	Dry	Dry	Dry	Dry	nm	Dry	Dry	Dry	Dry	nm	Dry	Dry	Dry			
Pond Staff Gage	NA	nm	nm	nm	nm	nm	nm	nm	1.49	nm	0.92	0.83	nm	nm	nm	nm	nm	nm	0.83	1.49	1.08

WELL	MP Elevation	Groundwater Elevation - feet above mean sea level (NAVD 88 vertical datum)																			
		5/20/14	6/18/14	6/30/14	7/14/14	7/28/14	8/11/14	8/19/14	8/26/14	9/15/14	10/16/14	10/29/14	11/24/14	1/6/15	4/14/15	7/1/15	7/31/15	10/6/15	Min	Max	Mean
MW-1	3957.83			3933.20	3932.72	3931.64	3932.48	3932.53	3930.54	3930.04	3929.35	3929.43	3928.64	3928.08	3928.37	3929.86		3928.31	3928.08	3933.20	3930.41
MW-2	4321.50		3827.50	3826.78	3826.25	3825.68	3826.28	3825.47	3825.36		3825.36	3825.04	3824.68	3824.53		3824.12	3823.65	3823.10	3823.65	3826.78	3825.37
MW-3D	3907.80	3822.20		3826.99	3856.09	3869.22	3873.70	3873.58	3876.52	3864.06	3877.21	3878.58	3871.60	3879.30	3879.84	3879.28		3880.00	3826.99	3880.00	3869.75
MW-3S	3907.16	3881.66		3883.71	3881.84	3881.78	3881.46	3881.46	3881.82	3882.24	3882.00	3881.98	3881.84	3881.94	3882.20	3882.06		3881.81	3881.46	3883.71	3882.01
MW-4	3902.07			3893.37	3891.42	3891.09	3890.69	3891.03	3891.78	3892.69	3892.46	3892.49	3892.23	3892.57	3892.91	3892.27		3892.26	3890.69	3893.37	3892.08
MW-5	3910.54			3902.01	3900.18	3900.06	3899.57	3899.13	3900.59	3900.70	3900.40	3900.39	3899.90	3900.97	3900.86	3899.97		3900.10	3899.13	3902.01	3900.37
B2	4305.68			4282.54	4282.53	4282.50	4282.46	4282.58	4282.41		4282.44	4282.39		4282.27	4282.54	4282.56	4282.53	4282.35	4282.27	4282.58	4282.47
B3	4280.93			4264.53	4264.68	4264.75	4264.81	4264.86	4264.78		4264.45	4264.29		4263.80	4264.26	4263.88	4263.73	4263.25	4263.73	4264.86	4264.47
B4	4353.46			4332.44	4332.18	4331.96	4331.86	4331.81	4331.74			4331.57		4331.39	4332.21	4331.72	4331.64	4331.38	4331.39	4332.44	4331.84
B6	4291.39			4266.16	4266.13	4266.08	4266.01	4266.08	4265.91		4265.78	4265.62		4265.23	4265.78	4265.42	4265.23	4264.80	4265.23	4266.16	4265.82
Homestead Well 1 (Tertiary)	4293.15			4264.45					4264.05		4263.78	4263.74		4263.90	4264.33	4263.69		4263.28	4263.28	4264.45	4263.90
Homestead Well 2 (Tertiary)	4136.20								4084.30		4084.45	4084.45							4084.30	4084.45	4084.40
Ranch House Well (Tertirary)	3957.56								3932.23		3931.41	3931.33		3932.90					3931.33	3932.90	3931.97
MLRPZ-37	4371.24																				
Pond Staff Gage	3909.29								3910.78		3910.21	3910.12							3910.12	3910.78	3910.37

nm- not measured

MP - Measuring Point; top of casing for wells, 0.00 on staff gage for Pond.

Monitoring locations shown on Figure 2-1.



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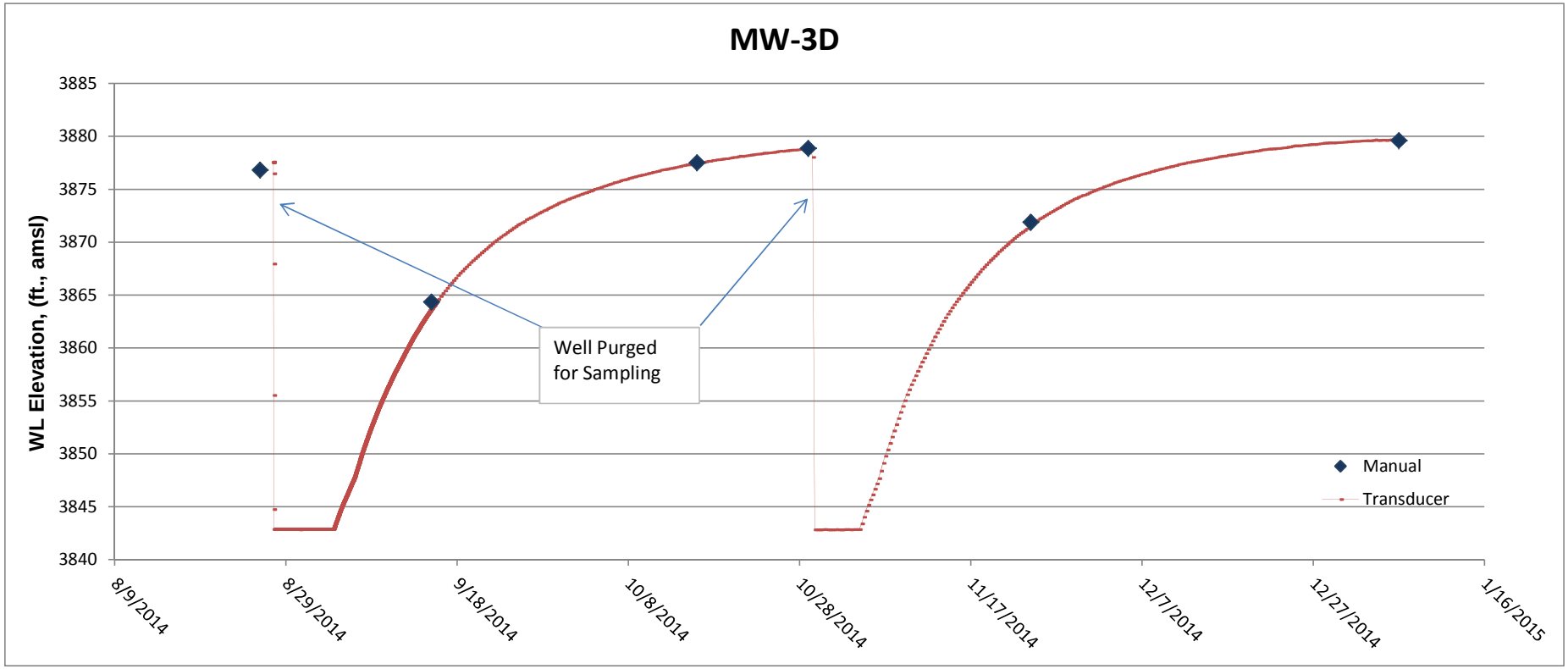

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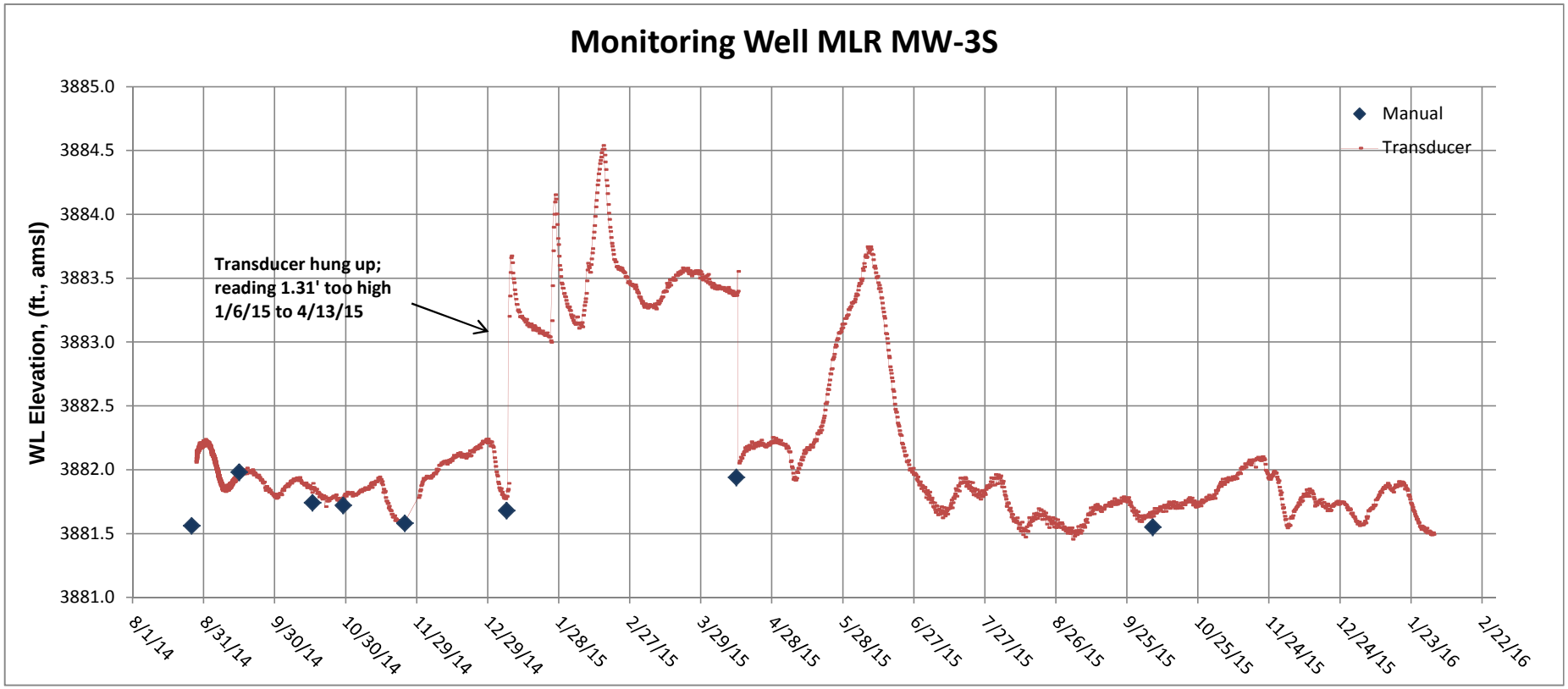

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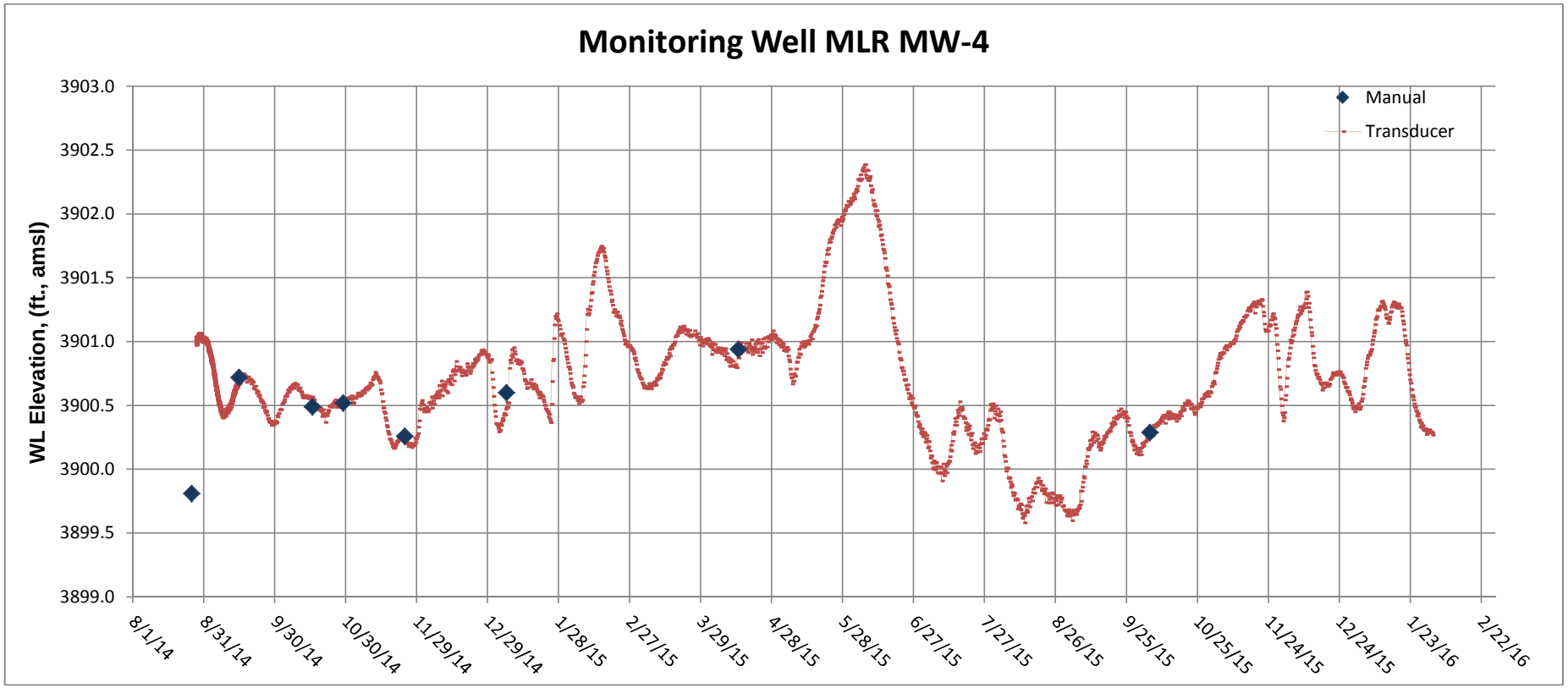

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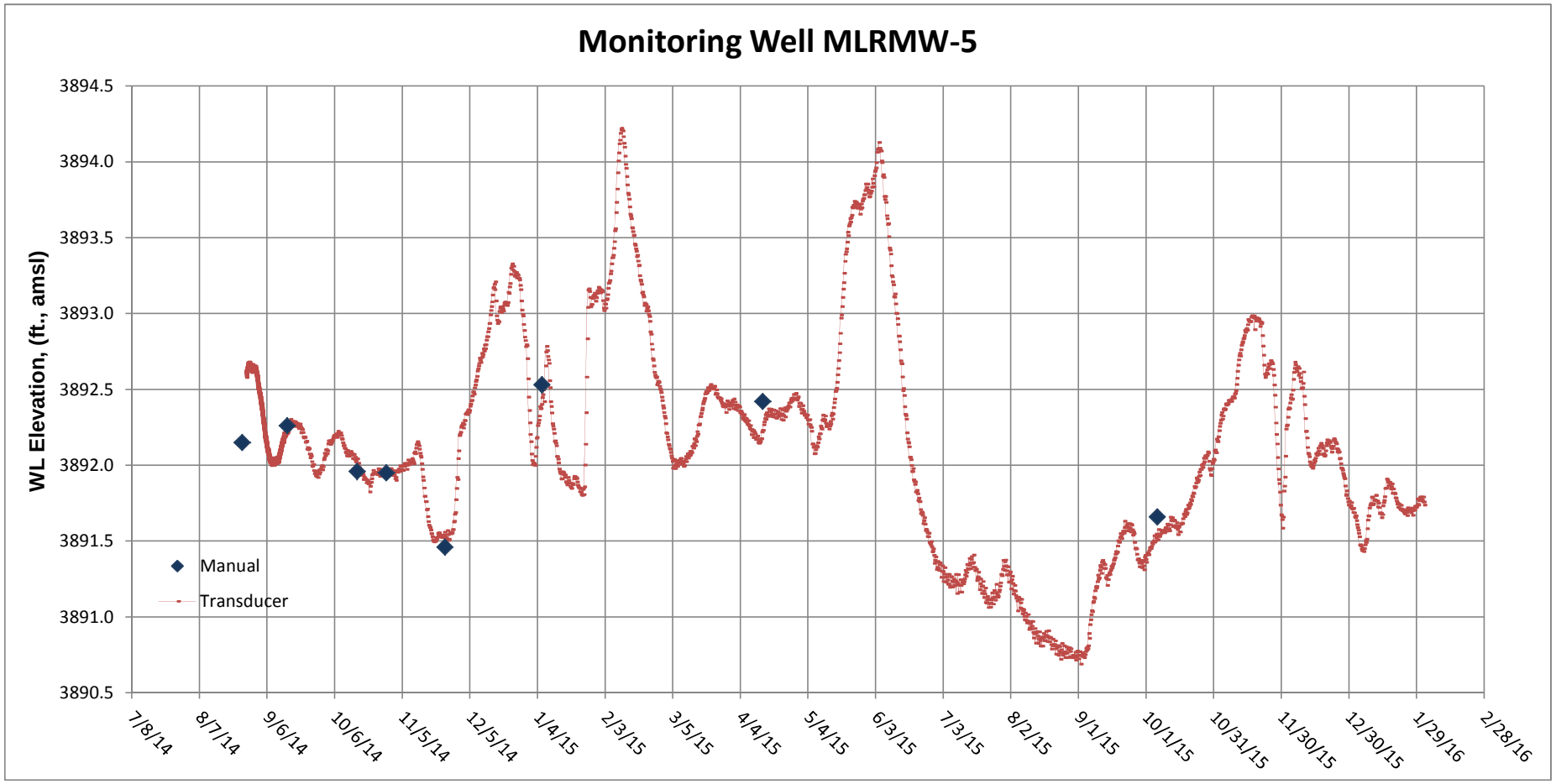

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Mt Limestone Resources Analysis Summary Report															
StationName		MW-1	MW-1	MW-1	MW-1	MW-1	MW-1	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2
Sample Date		6/26/2014	8/27/2014	10/29/2014	4/13/2015	7/1/2015	10/6/2015	7/2/2014	8/28/2014	8/28/2014	10/30/2014	4/13/2015	4/13/2015	7/2/2015	10/7/2015
Field Sample ID		MLR-1406-200	MLR-1408-200	MLR-1410-200	MLR-1504-101	MLR-1507-104	MLR-1510-100	MLR-1406-208	MLR-1408-201	MLR-1408-202	MLR-1410-203	MLR-1504-102	MLR-1504-103	MLR-1507-105	MLR-1510-105
Lab Name		Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs
Remarks										Duplicate			Duplicate		
Lab Sample ID	Units	H14060567-001	H14080569-001	H14100631-001	H15040187-002	H15070051-005	H15100142-001	H14070190-001	H14080569-002	H14080569-003	H14100631-004	H15040187-003	H15040187-004	H15070051-006	H15100142-001
Field Parameters															
Depth to Water	Feet	24.16	26.96	28.36	29.46	27.97	29.52	495.5	495.8		496.46	496.77		497.38	498.4
Dissolved Oxygen	mg/L	5.17	4.18	3.53	3.73	3.25	3.23	0.83	0.73		0.88	0.7		1.39	1.6
Field pH	s.u.	7.26	7.26	7.29	7.07	7.31	7.14	7.32	7.27		7.51	7.52		7.51	7.29
Field Specific Cond.	umhos/cm	511	505	512	502	500	509	896	825		824	779		775	774
Water Temperature	Deg C	10.8	11.1	10.5	10.4	10.8	10.4	15.9	15.9		15.8	15.8		15.9	15.7
Physical Parameters															
Total Dissolved Solids	mg/L	336	313	342	313	327	326	638	574	574	584	547	550	553	548
Total Suspended Solids	mg/L	518	120	78	22	26	14	<10	<10	<20	<10	<10	<10	<10	<10
Major Constituents / Commons Ions															
Alkalinity as CaCO3	mg/L	160	160	150	170	160	160	170	160	160	170	170	170	170	170
Chloride	mg/L	3	3	3	3	3	2	7	6	6	5	5	5	5	4
Fluoride	mg/L	1.4	1.4	1.4	1.3	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5
Sulfate	mg/L	82	89	91	83	84	92	300	280	270	260	251	250	243	231
Nutrients															
Phosphorus (TOT)	mg/L	0.31	0.26	0.23	0.108	0.105	0.09	0.05	0.02	0.02	0.02	0.022	0.022	0.019	0.013
Total Nitrogen as N	mg/L	0.8	0.6	0.25	0.61	0.58	0.22	0.7	0.1	0.3	<0.04	0.12	0.12	0.14	0.05
Metals - Trace Constituents															
Aluminum (DIS)	mg/L	1.46	0.093	<0.009	0.066	0.316	0.031	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	0.012	<0.009
Antimony (DIS)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0015	0.0029	0.0029	0.002	0.0012	0.0012	0.0008	0.0007
Arsenic (DIS)	mg/L	0.005	0.004	0.004	0.006	0.005	0.003	0.006	0.010	0.010	0.016	0.027	0.027	0.028	0.023
Barium (DIS)	mg/L	0.055	0.044	0.041	0.055	0.051	0.037	0.027	0.028	0.029	0.035	0.037	0.036	0.035	0.031
Beryllium (DIS)	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Cadmium (DIS)	mg/L	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
Calcium (DIS)	mg/L	62	52	54	57	55	60	115	98	97	97	95	96	93	99
Chromium (DIS)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
Cobalt (DIS)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.011	0.011	0.01	0.01	0.009	0.009	0.008
Copper (DIS)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron (DIS)	mg/L	0.54	0.04	<0.02	0.03	0.13	<0.02	0.05	0.21	0.23	0.75	0.3	0.3	0.4	0.18
Lead (DIS)	mg/L	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.0007	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Magnesium (DIS)	mg/L	14	13	13	14	13	15	36	31	31	32	32	32	32	33
Manganese (DIS)	mg/L	0.046	0.036	0.031	0.006	0.006	0.009	0.097	0.451	0.456	0.544	0.849	0.848	0.845	0.703
Mercury (DIS)	mg/L	<0.000005	<0.000005	<0.000005	<0.000005	0.0000062	<0.000005	<0.000005	0.000008	0.000008	0.0000063	0.0000054	0.000006	0.0000181	<0.000005
Molybdenum (DIS)	mg/L	0.005	0.005	0.005	0.005	0.005	0.005	0.009	0.005	0.005	0.004	0.004	0.004	0.004	0.003
Nickel (DIS)	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.006	0.046	0.045	0.048	0.045	0.045	0.046	0.042
Potassium (DIS)	mg/L	15	14	15	15	16	15	4	4	4	4	3	3	3	3
Selenium (DIS)	mg/L	0.002	0.002	0.002	0.001	0.001	0.002	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver (DIS)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sodium (DIS)	mg/L	24	22	22	17	19	23	29	21	22	21	17	17	17	16
Strontium (DIS)	mg/L	2	2.05	2.08	2.29	2.25	2.19	0.91	0.89	0.89	0.91	0.89	0.89	0.89	0.91
Thallium (DIS)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	0.0003	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium (DIS)	mg/L	0.0022	0.0017	0.0016	0.002	0.0019	0.0016	0.0022	0.0017	0.0017	0.0017	0.0016	0.0016	0.0016	0.0016
Zinc (DIS)	mg/L	<0.008	<0.008	<0.008	<0.008	0.01	<0.008	0.031	0.019	0.021	0.02	<0.008	<0.008	0.034	<0.008

BASELINE GROUNDWATER SAMPLING RESULTS - MONTANA LIMESTONE RESOURCES

Mt Limestone Resources Analys															
StationName		MW-3D	MW-3D	MW-3D	MW-3D	MW-3D	MW-3D	MW-3S	MW-3S	MW-3S	MW-3S	MW-3S	MW-3S	MW-3S	MW-4
Sample Date		7/2/2014	8/28/2014	10/30/2014	4/14/2015	7/2/2015	10/7/2015	6/26/2014	8/28/2014	10/29/2014	4/13/2015	7/1/2015	7/1/2015	10/6/2015	6/26/2014
Field Sample ID		MLR-1406-207	MLR-1408-206	MLR-1410-206	MLR-1504-104	MLR-1507-106	MLR-1510-106	MLR-1406-201	MLR-1408-205	MLR-1410-201	MLR-1504-100	MLR-1507-100	MLR-1507-101	MLR-1510-101	MLR-1406-202
Lab Name		Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs
Remarks													Duplicate		
Lab Sample ID	Units	H14070062-001	H14080569-007	H14100631-007	H15040187-005	H15070051-007	H15100142-001	H14060567-002	H14080569-006	H14100631-002	H15040187-001	H15070051-001	H15070051-002	H15100142-001	H14060567-003
Field Parameters															
Depth to Water	Feet	37.1	30.49	29.22	27.96	28.52	71.07	23.72	24.8	25.18	24.96	25.1		25.35	8.21
Dissolved Oxygen	mg/L	1.11	0.64	1.58	1.87	2.77	1	2.33	2.46	1.59	1.73	2.16		1.67	2.51
Field pH	s.u.	7.94	7.65	7.58	7.2	7.45	7.28	7.02	7.11	7.18	6.99	7.2		7.15	7.4
Field Specific Cond.	umhos/cm	589	560	621	578	591	617	506	498	494	426	470		513	425
Water Temperature	Deg C	10.1	10.9	9.6	9.9	10.6	10.3	8.5	11.4	12.3	7.6	8.5		12.2	9.9
Physical Parameters															
Total Dissolved Solids	mg/L	333	400	408	430	463	474	323	307	303	271	300	308	333	273
Total Suspended Solids	mg/L	294	972	647	41	217	485	<10	<10	10	<10	<10	12	<10	<10
Major Constituents / Commons Ions															
Alkalinity as CaCO3	mg/L	97	160	170	200	210	220	190	190	180	160	180	180	190	150
Chloride	mg/L	2	2	2	1	2	1	6	8	7	6	7	7	7	7
Fluoride	mg/L	1.9	1.2	1.1	1.1	1.2	1.2	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4
Sulfate	mg/L	150	170	150	152	156	150	53	58	54	50	51	52	65	43
Nutrients															
Phosphorus (TOT)	mg/L	1.08	0.8	0.68	0.06	0.269	0.496	0.04	0.04	0.05	0.043	0.041	0.04	0.039	0.03
Total Nitrogen as N	mg/L	0.2	0.1	<0.04	<0.04	0.05	<0.04	0.3	<0.1	<0.04	<0.04	0.13	0.13	0.09	0.4
Metals - Trace Constituents															
Aluminum (DIS)	mg/L	0.029	0.183	0.205	0.175	3.18	1.09	<0.009	<0.009	<0.009	0.011	<0.009	<0.009	<0.009	<0.009
Antimony (DIS)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	0.0009	0.0009	0.0008	0.0008	0.0008	0.001	0.0007
Arsenic (DIS)	mg/L	0.004	0.002	0.002	0.002	0.003	0.002	0.007	0.006	0.006	0.005	0.006	0.006	0.006	0.006
Barium (DIS)	mg/L	0.036	0.05	0.044	0.038	0.075	0.091	0.081	0.081	0.081	0.069	0.075	0.075	0.085	0.056
Beryllium (DIS)	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Cadmium (DIS)	mg/L	0.00006	<0.00003	0.00003	0.00005	0.00006	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
Calcium (DIS)	mg/L	69	88	90	98	104	113	69	65	63	57	65	64	74	54
Chromium (DIS)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005
Cobalt (DIS)	mg/L	<0.005	<0.005	<0.005	<0.005	0.007	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper (DIS)	mg/L	<0.002	<0.002	<0.002	0.003	0.004	<0.002	<0.002	<0.002	0.007	<0.002	<0.002	<0.002	<0.002	<0.002
Iron (DIS)	mg/L	<0.02	0.08	0.11	0.08	1.56	0.71	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Lead (DIS)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	0.0014	0.0005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Magnesium (DIS)	mg/L	13	16	16	17	19	20	13	13	12	11	13	13	15	11
Manganese (DIS)	mg/L	0.033	0.162	0.029	0.164	0.279	0.27	0.003	0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001
Mercury (DIS)	mg/L	<0.000005	<0.000005	<0.000005	<0.000005	0.000016	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	0.0000052	0.0000058	<0.000005	<0.000005
Molybdenum (DIS)	mg/L	0.021	0.011	0.009	0.007	0.005	0.005	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Nickel (DIS)	mg/L	<0.002	0.006	0.005	0.007	0.009	0.009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Potassium (DIS)	mg/L	4	4	4	4	4	4	4	4	4	3	4	4	4	3
Selenium (DIS)	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver (DIS)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sodium (DIS)	mg/L	8	10	9	8	9	9	14	14	14	12	14	14	16	13
Strontium (DIS)	mg/L	0.8	1.04	1.04	1.12	1.21	1.26	0.31	0.31	0.3	0.27	0.3	0.3	0.33	0.25
Thallium (DIS)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium (DIS)	mg/L	0.0019	0.0045	0.0034	0.0034	0.0035	0.0034	0.0047	0.0047	0.0041	0.0042	0.0043	0.0043	0.0046	0.0054
Zinc (DIS)	mg/L	<0.008	<0.008	0.023	0.027	0.014	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008

BASELINE GROUNDWATER SAMPLING RESULTS - MONTANA LIMESTONE RESOURCES

Mt Limestone Resources Analys															
StationName		MW-4	MW-4	MW-4	MW-4	MW-4	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5
Sample Date		8/28/2014	10/29/2014	4/14/2015	7/1/2015	10/6/2015	6/26/2014	6/26/2014	8/28/2014	10/30/2014	10/30/2014	4/14/2015	7/1/2015	10/6/2015	10/6/2015
Field Sample ID		MLR-1408-204	MLR-1410-202	MLR-1504-105	MLR-1507-102	MLR-1510-102	MLR-1406-203	MLR-1406-204	MLR-1408-203	MLR-1410-204	MLR-1410-205	MLR-1504-106	MLR-1507-103	MLR-1510-103	MLR-1510-104
Lab Name		Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs	Energy Labs
Remarks								Duplicate			Duplicate				Duplicate
Lab Sample ID	Units	H14080569-005	H14100631-003	H15040187-006	H15070051-003	H15100142-001	H14060567-004	H14060567-005	H14080569-004	H14100631-005	H14100631-006	H15040187-007	H15070051-004	H15100142-001	H15100142-001
Field Parameters															
Depth to Water	Feet	9.04	9.61	9.16	9.8	9.81	8.55		9.46	10.18		9.68	10.57	10.44	
Dissolved Oxygen	mg/L	4.62	3.24	4.2	3.3	2.79	0.46		0.45	0.4		0.42	0.4	0.54	
Field pH	s.u.	7.36	7.36	7.11	7.36	7.27	7.1		7.13	7.18		6.97	7.16	7.1	
Field Specific Cond.	umhos/cm	410	435	444	426	449	515		576	660		559	565	553	
Water Temperature	Deg C	12.8	10.5	7.8	11.2	11.8	8.7		10.7	10.9		3.3	7.1	10.1	
Physical Parameters															
Total Dissolved Solids	mg/L	246	274	278	273	288	344	335	365	436	436	357	375	369	365
Total Suspended Solids	mg/L	<10	<10	10	<10	<10	<20	<10	<10	<10	<10	<10	<10	<10	<10
Major Constituents / Commons Ions															
Alkalinity as CaCO3	mg/L	160	160	160	160	170	180	180	200	210	210	190	190	190	190
Chloride	mg/L	6	6	10	8	7	6	6	8	9	9	8	8	7	7
Fluoride	mg/L	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5
Sulfate	mg/L	41	44	49	45	53	70	69	89	110	110	91	88	84	84
Nutrients															
Phosphorus (TOT)	mg/L	0.05	0.05	0.051	0.043	0.043	0.04	0.04	0.04	0.04	0.04	0.035	0.039	0.04	0.041
Total Nitrogen as N	mg/L	<0.1	<0.04	0.11	0.3	<0.04	0.2	0.2	<0.1	<0.04	<0.04	<0.04	0.07	<0.04	<0.04
Metals - Trace Constituents															
Aluminum (DIS)	mg/L	0.009	<0.009	0.026	0.06	<0.009	<0.009	<0.009	0.049	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
Antimony (DIS)	mg/L	0.0008	0.0008	0.0009	0.0009	0.0009	0.0007	0.0007	0.0007	0.0007	0.0007	0.0006	0.0007	0.0009	0.0009
Arsenic (DIS)	mg/L	0.007	0.007	0.006	0.007	0.006	0.007	0.007	0.007	0.007	0.007	0.005	0.006	0.006	0.006
Barium (DIS)	mg/L	0.058	0.059	0.064	0.062	0.064	0.067	0.068	0.081	0.094	0.094	0.075	0.078	0.076	0.076
Beryllium (DIS)	mg/L	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Cadmium (DIS)	mg/L	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	0.00004	0.00004	0.00004	0.00004	0.00005	0.00003	0.00004	0.00005	0.00005
Calcium (DIS)	mg/L	51	55	57	56	62	65	64	73	87	86	74	74	77	77
Chromium (DIS)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01
Cobalt (DIS)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper (DIS)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002	<0.002	<0.002	<0.002	<0.002	0.012	<0.002	<0.002
Iron (DIS)	mg/L	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Lead (DIS)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.0009	<0.0003	<0.0003
Magnesium (DIS)	mg/L	11	12	12	12	14	13	13	15	17	17	15	15	16	16
Manganese (DIS)	mg/L	<0.001	<0.001	0.001	0.004	<0.005	0.002	0.002	0.005	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005
Mercury (DIS)	mg/L	<0.000005	<0.000005	<0.000005	0.0000063	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Molybdenum (DIS)	mg/L	0.004	0.003	0.003	0.003	0.003	0.005	0.004	0.005	0.005	0.005	0.002	0.003	0.004	0.004
Nickel (DIS)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Potassium (DIS)	mg/L	3	3	3	4	4	4	4	4	5	5	3	4	4	5
Selenium (DIS)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver (DIS)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sodium (DIS)	mg/L	13	13	12	13	13	18	18	18	20	20	16	19	19	20
Strontium (DIS)	mg/L	0.25	0.26	0.27	0.26	0.28	0.34	0.34	0.39	0.46	0.45	0.38	0.39	0.39	0.39
Thallium (DIS)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium (DIS)	mg/L	0.0047	0.005	0.0055	0.0047	0.0057	0.0044	0.0044	0.0048	0.0052	0.0052	0.0072	0.0062	0.0054	0.0054
Zinc (DIS)	mg/L	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.009	0.011	0.011	<0.008	0.011	0.008	0.008

	MLR MW-1				MLR MW-2				MLR MW-3S				MLR MW-3D				MLR MW-4				MLR MW-5			
	n	# Det	% Detectable Concentrations	% HHS Exceedances	n	# Det	% Detectable Concentrations	% HHS Exceedances	n	# Det	% Detectable Concentrations	% HHS Exceedances	n	# Det	% Detectable Concentrations	% HHS Exceedances	n	# Det	% Detectable Concentrations	% HHS Exceedances	n	# Det	% Detectable Concentrations	% HHS Exceedances
Aluminum (DIS)	6	5	83%	0%	6	1	17%	0%	6	1	17%	0%	6	6	100%	0%	6	3	50%	0%	6	1	17%	0%
Antimony (DIS)	6	0	0%	0%	6	6	100%	0%	6	6	100%	0%	6	0	0%	0%	6	6	100%	0%	6	6	100%	0%
Arsenic (DIS)	6	6	100%	0%	6	6	100%	67%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%
Barium (DIS)	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%
Beryllium (DIS)	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%
Cadmium (DIS)	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%	6	4	67%	0%	6	0	0%	0%	6	6	100%	0%
Calcium (DIS)	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%
Chromium (DIS)	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%
Cobalt (DIS)	6	0	0%	0%	6	5	83%	0%	6	0	0%	0%	6	2	33%	0%	6	0	0%	0%	6	0	0%	0%
Copper (DIS)	6	0	0%	0%	6	0	0%	0%	6	1	17%	0%	6	2	33%	0%	6	0	0%	0%	6	2	33%	0%
Iron (DIS)	6	4	67%	0%	6	6	100%	0%	6	0	0%	0%	6	5	83%	0%	6	1	17%	0%	6	1	17%	0%
Lead (DIS)	6	1	17%	0%	6	1	17%	0%	6	0	0%	0%	6	2	33%	0%	6	0	0%	0%	6	1	17%	0%
Magnesium (DIS)	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%
Manganese (DIS)	6	6	100%	0%	6	6	100%	0%	6	2	33%	0%	6	6	100%	0%	6	2	33%	0%	6	2	33%	0%
Mercury (DIS)	6	1	17%	0%	6	4	67%	0%	6	1	17%	0%	6	1	17%	0%	6	1	17%	0%	6	0	0%	0%
Molybdenum (DIS)	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%
Nickel (DIS)	6	1	17%	0%	6	6	100%	0%	6	0	0%	0%	5	6	120%	0%	6	0	0%	0%	6	0	0%	0%
Potassium (DIS)	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%
Selenium (DIS)	6	6	100%	0%	6	1	17%	0%	6	0	0%	0%	6	1	17%	0%	6	0	0%	0%	6	0	0%	0%
Silver (DIS)	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%
Sodium (DIS)	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%
Strontium (DIS)	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%
Thallium (DIS)	6	0	0%	0%	6	2	33%	0%	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%	6	0	0%	0%
Uranium (DIS)	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%	6	6	100%	0%
Zinc (DIS)	6	1	17%	0%	6	4	67%	0%	6	0	0%	0%	6	3	50%	0%	6	0	0%	0%	6	4	67%	0%

N - Number of samples
#Det - Number of results greater than Project Required Detection Limit
Below detection values replaced with 1/2 the PRDL for calculation of average concentrations.
NA - Average not calculated where fewer than 50% of results are greater than PRDL.
Duplicate samples not included in stats
Monitoring site locations shown on Figure 2-1.