

**Stillwater Mining Company
Benbow Exploration Portal & Support Facilities
Dean, Montana**

Appendix F Water Inventory

**PLAN OF OPERATIONS FOR MINERAL EXPLORATION
Benbow Exploration Portal and Support Facilities**

STILLWATER MINING COMPANY
- SPRING AND SEEP INVENTORY
PROPOSED BENBOW BLITZ ADIT BREAKOUT -

Prepared for:

Stillwater Mining Company
H.C. 54, Box 365
Nye, MT 59061

Prepared by:

Hydrometrics, Inc.
5602 Hesper Road
Billings, Mt 59106

MAY 2012
(revised February 2013)

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SPRING AND SEEP INVENTORY PROPOSED BENBOW BLITZ ADIT BREAKOUT

1.0 INTRODUCTION

At the request of the Stillwater Mining Company (SMC), Hydrometrics conducted a spring and seep inventory for a proposed adit breakout location. The Benbow Blitz Adit Breakout is located within the boundaries of the patented Fat Tire Claimblock. This area, as well as the proposed Fat Tire Claim Addition, were the focus of the spring and seep inventory. The purpose of the spring and seep inventory was to:

1. Identify any springs or seeps present in the vicinity of the anticipated breakout,
2. Identify potential monitoring sites on each identified spring or seep, and
3. Collect initial water quality data from the identified monitoring sites.

Based on the results of the spring and seep inventory, a monitoring program will be developed to monitor water sources in the vicinity of the proposed breakout.

1.1 SITE LOCATION

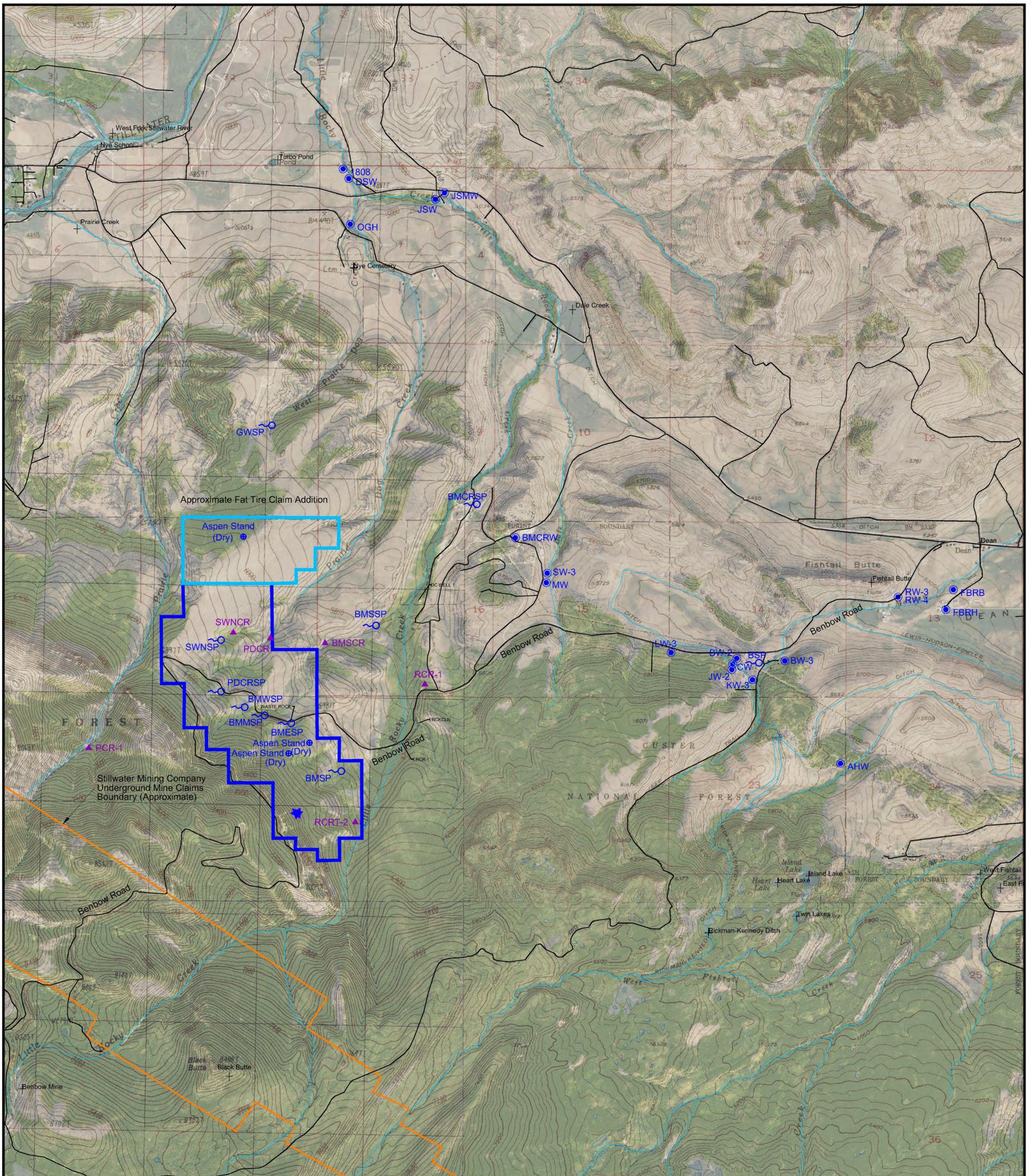
Field reconnaissance was conducted in the vicinity of the future breakout. The area investigated for this project (Study Area) included the Fat Tire Claimblock and proposed Fat Tire Claim Addition, which are situated north of the Benbow Mine between Little Rocky Creek and Prairie Creek. Figure 1 shows the Study Area and the proposed breakout location. Location coordinates for the proposed breakout, provided by SMC are:

109d 46m 07s Longitude W (596403.82 E UTM-m)

45d 22m 56s Latitude N (5026154.28 UTM-m)

6,440 ft elevation (1,963 m elevation)

UPDATE TIME: 11:33 AM
 L:\MASON, B.L.\20120515\LAND PROJECTS\STILLWATER\11088112B004.DWG

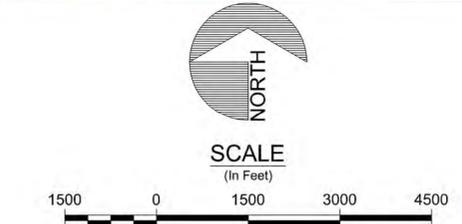


LEGEND

Map Features

- Creek Site
- Private Well
- Spring
- Benbow Blitz Study Area (Approximate)
- Stillwater Mining Company Underground Mine Claims Boundary (Approximate)
- Streams
- Roads
- Proposed Benbow Portal

Private Wells	
1808	1808 Nye road
AHW	Abbotts House Well
BMCRW	Beartooth Mountains Christian Ranch Well
BW-2	Blunt Well
BW-3	Bullman Well
CW	Castles Well
DSW	Doug Sheemer Well
FBRB	Fistail Basin Ranch Barn Well
FBRH	Fistail Basin Ranch House Well
JSMW	Jack Sheemer Main well
JSW	Jack Sheemer house well
JW-2	Johnson Well
KW-3	Kroll Well
LW-3	Lindley Well
MW	Mattson Well
OGH	Old Guthrie Place well
RW-3	Rickman Old House Well
RW-4	Rickman Modular House Well
SW-3	Shieldt Well



Springs	
BMCRSP	Beartooth Mountains Christian Ranch Spring
BMESP	Benbow Mill East Spring
BMMSF	Benbow Mill Middle Spring
BMSP	Benbow Mill Spring
BMSSP	Benbow Mill Site Seep
BMWSP	Benbow Mill West Spring
BSP	Bollman Spring
GWSP	Griffen/Wolf Spring
PDCRSP	Prairie Dog Creek Spring
SWNSP	Swinecker Spring

Creek Sites	
BMSCR	Benbow Mill Site Creek
PCR-1	Prairie Creek - Site 1
PDCR	Prairie Dog Creek
RCR-1	Rocky Creek Site 1
RCRT-2	Rocky Creek Tributary - Site 2
SWNCR	Swinecker Creek

1.2 PROJECT APPROACH

Work conducted in association with the spring and seep inventory were completed in three tasks as follows:

- Task 1. Evaluate Available Information
- Task 2. Field Reconnaissance
- Task 3. Reporting

This report (Task 3) summarizes results of Tasks 1 and 2.

1.3 EVALUATE AVAILABLE DATA

Hydrometrics conducted a search of the Montana Department of Natural Resources and Conservation (DNRC) water rights database to identify existing water rights within the project area. Seven water rights were identified within, or near, the Study Area. Five of the water rights are for water from Little Rocky Creek, one is for water from an unnamed tributary to Little Rocky Creek, and one is for water from an unnamed spring forming a tributary to Prairie Dog Creek. Table 1 contains a summary of the existing water rights identified in the area.

TABLE 1. EXISTING WATER RIGHTS WITHIN OR NEAR THE CLAIM AREA

Water Right Number	Owner	Source Name	Means of Diversion	Max Flow Rate	Volume (ac-ft)	Quarter Section	Tnshp/ Section Range
43C 57756 00	USA Forest Service	Spring, Unnamed Trib of Prairie Dog Ck	Spring Box			SENE SW	17 5S16E
43C 195888 00	Benbow Mine	Little Rocky Creek	Pump	1.83 cfs	660	SWNESW	21 5S16E
43C 206841 00	Benbow Mine	Little Rocky Creek	Pump	27 gpm	40	SWNESW	21 5S16E
43C 189539 00	Atlantic Richfield Co.	Little Rocky Creek	Pump	260 gpm	210.48	NENESW	21 5S16E
43C 189540 00	Atlantic Richfield Co.	Little Rocky Creek	Pump	13 gpm	18	SENE W	21 5S16E
43C 30017725	MT Fish Wildlife & Parks	Little Rocky Creek	Instream		1,290		21 5S16E
43C 100099 00	Beartooth Mtn. Christian Ranch	Unnamed Trib of Little Rocky Ck	Headgate	200 gpm	187.4	NWNWNE	21 5S16E

Aerial photographs of the area from the TerraServer internet site were reviewed to identify the potential for springs and to identify access points to the area for surface reconnaissance. In addition to the major creeks Prairie Dog Creek and Little Rocky Creek, all potential surface

water areas were identified on the aerial photographs. These areas were closely investigated in the field.

Topographic maps of the area were also examined prior to conducting fieldwork in order to identify landforms that would be indicative of the potential presence of water in the area. Groundwater sometimes issues along the topographical break between steep terrain and flatter terrain as is present along the central and northern part of the study area. Based on the aerial photo and topographical map reviews, it was decided where to confirm and check for surface water during helicopter reconnaissance.

1.4 FIELD WORK SITE CONDITIONS AND METHODOLOGY

Hydrometrics personnel conducted fieldwork on July 26-27, 2011, August 17-18, 2011, and February 9, 2012. Both aerial and on-site investigations were conducted. The boundaries of the Fat Tire Claim, shown in dark blue on Figure 1, were investigated during fieldwork conducted in July and August 2011. The spring and summer of 2011 experienced higher than average precipitation. However, there had been little precipitation in the area during the period immediately prior to the summer field investigations and weather conditions were hot, with clear skies. Hence, any surface water encountered during the site investigations would likely emanate from groundwater sources and not from precipitation runoff.

The land within the boundaries of the Fat Tire Claim Addition, shown in light blue on Figure 1, were the focus of February 2012 investigation. The winter of 2012 prior to the February investigation was drier and warmer than average. In fact, there was very little snow cover in the area of the investigation. Thus the area could be surveyed for surface water flow, and any surface water encountered would likely come from groundwater sources and not from runoff.

A helicopter reconnaissance was conducted prior to conducting foot surveys. SMC personnel made arrangements for helicopter support. Three representatives of local “Good Neighbor” landowners accompanied the Hydrometrics field crew during the summer helicopter surveillance to help identify access routes and potential “wet” areas. The bench area around the proposed

Benbow adit breakout area was the focal point of the helicopter survey. However, the helicopter was also used to view rugged areas that encompass the Study Area. Each surface drainage identified on the aerial photos and topographic maps was investigated by helicopter. In addition, every aspen tree patch and dense vegetation area that exhibited visual signs of potential surface water or shallow groundwater were investigated by helicopter for signs of surface water. Access to surface water areas was noted for further ground inspection.

Following the helicopter investigation, Hydrometrics personnel walked over the study area where surface water was identified during the helicopter reconnaissance. Hydrometrics personnel walked the length of Benbow Road within the Fat Tire Claim area; several springs were intersected and accessible from the road. During the February investigation, Hydrometrics personnel walked along the slopes of both sides of the main ridge line within the Fat Tire Claim Addition from the west side then along the northern border of the Study Area, and circled back around on the east side of the ridge. They also walked along the ridge line and investigated some dry aspen tree stands. No surface water or shallow groundwater was observed in the Fat Tire Claim Addition.

2.0 WATER RESOURCES INVENTORY

2.1 INVENTORY OVERVIEW

Six springs and seeps and three creeks were identified within the Study Area. In addition, one seep and three creek sites were identified and monitored that were downstream of the Study Area boundaries. These sites outside of the Study Area were monitored for the following reasons:

1. The location BMSCR was the best place to establish a site along Benbow Mill Site Creek and is close to the downstream border of the Study Area.
2. Seep BMSSP was noted along the access to site BMSCR.
3. PCR-1 and RCR-1 are both established monitoring sites for SMC's annual voluntary monitoring program. These sites are both near the Study Area, and were monitored for this project at SMC's request.

Site data sheets containing site photos, date, time, and water quality results are included for each site monitored during the spring and seep inventory. These site data sheets are included in Appendix A.

2.2 SPRINGS

Six springs were identified within the Benbow Blitz Study Area. These are designated as follows (from north to south):

- SWNSP – Swinecker Spring
- PDCRSP – Prairie Dog Creek Spring
- BMWSP – Benbow Mill West Spring
- BMMSP – Benbow Mill Middle Spring
- BMESP – Benbow Mill East Spring
- BMSP – Benbow Mill Spring

Flow at spring sites within the study area ranged from 1.9 gpm at BMSP to 5.4 gpm at BMWSP. These sites and their flows are tabulated below.

TABLE 2. MEASURED FLOWS AT SPRINGS WITHIN THE STUDY AREA

Spring Site	Measured Flow (gpm)	Measurement Method
BMSP	1.9	90° V-notch flume
BMESP	0.3	90° V-notch flume
BMMSP	2.6	90° V-notch flume
BMWSP	5.4	90° V-notch flume
PDCRSP	3.4	90° V-notch flume
SWNSP	2.1	Volumetric: 1 liter in 7.4 seconds

In addition, one seep was identified outside of the study area. Although not within the study area, this site was also photographed and sampled. The Benbow Mill Site Seep (BMSSP) had no flow, but was a wet, marshy seep area.

2.3 CREEKS

Four new creek sites were identified within (or very near) the Study Area boundary. These are:

- SWNCR – Swinecker Creek
- PDCR – Prairie Dog Creek
- BMSCR – Benbow Mill Site Creek
- RCRT-2 – Little Rocky Creek Tributary – Site 2

Two additional creek sites that lie near the Study Area were monitored at the request of SMC:

- PCR-1 – Prairie Creek – Site 1, and
- RCR-1 – Little Rocky Creek – Site 1.

These sites are established SMC monitoring sites for the annual voluntary water resources monitoring. All the creek sites and flows are tabulated below.

TABLE 3. MEASURED FLOWS AT CREEK SITES

Creek Site	Measured Flow (gpm)	Measurement Method
SWNCR	11.2	90° V-notch flume
PDCR	9.4	90° V-notch flume
BMSCR	6.7	90° V-notch flume
RCRT-2	42.2	90° V-notch flume
PCR-1	145	90° V-notch flume
RCR-1	4,340	Marsh McBirney

2.4 WATER QUALITY

Water quality samples were collected at all inventoried sites except BMSSP, which did not have enough water to collect a sample. Water from each site was analyzed for field parameters, including specific electrical conductance (SC), pH, and temperature, and samples were delivered to Energy Laboratories for analysis of common ions, metals, and nutrients.

2.4.1 Surface Water Quality Results

Surface water analyzed from the Benbow Blitz site is a calcium-bicarbonate type with good quality. Field measured pH at surface water sites ranged from 7.4 to 8.4 with an average of 8.0. Field measured specific conductivity (SC) ranged from 45 to 469 umhos/cm with an average of 306 umhos/cm, and laboratory measured SC ranged from 78 to 630 umhos/cm with an average of 389 umhos/cm. Total dissolved solids (TDS) ranged from 58 to 368 mg/L with an average of 230 mg/L. Nutrient and total recoverable heavy metal concentrations were low or below

detection limits. Table 4 contains a summary of the field and laboratory data from the sampled spring and creek sites. Data can also be found on the Site Data Sheets (Appendix A) for each site, or in the Analysis Summary Report found in Appendix B.

TABLE 4. WATER QUALITY RESULTS FOR SPRING AND CREEK SITES

SITE CODE	BMSCR	BMESP	BMMSP	BMSP	BMWSP	BSP	PCR-1	PDCR	PDCRSP	RCR-1	RCRT-2	SWNCR	SWNSP
Sample Date	8/17/2011	8/18/2011	8/18/2011	8/17/2011	8/18/2011	7/26/2011	8/17/2011	8/17/2011	8/18/2011	8/18/2011	8/17/2011	8/17/2011	8/17/2011
Sample Number	1108-BMCR	1108-BMESP	1108-BMMSP	1108-BMSP	1108-BMWSP	1107-BSP	1108-PCR1	1108-PDCR	1108-PDCRSP	1108-RCR1	1108-RCRT2	1108-SWNCR	1108-SWNSP
Laboratory ID Number	1108191004	1108191008	1108191009	1108191006	1108191010	1107272906	1108191007	1108191003	1108191011	1108191012	1108191005	1108191002	1108191001
Sample Time	14:55	8:00	8:20	16:30	8:45	12:50	18:30	14:00	9:20	10:00	15:35	12:35	12:15
Field Parameters													
Flow (gpm)	6.73	0.31	2.60	1.93	5.35	25 E	145	9.42	3.41	4,340	42.2	11.2	2.14
Flow (cfs)										9.67			
pH (S.U.)	8.2	7.2	7.8	8.1	7.8	6.5	7.8	7.9	8	7.7	7.6	7.9	7.4
pH (field) (S.U.)	8.39	8.3	8.38	8.29	8.05	7.95	8.05	7.96	8.38	8.4	7.9	8.02	7.74
SC (umhos/cm @ 25 C)	543	630	568	559	573	78	134	492	466	106	147	475	473
SC (umhos/cm @ 25 C) (fld)	467.5	417.1	248.2	469.1	448.1	45.4	112.6	408.7	395.9	91.4	125.6	410.2	411.2
TDS (measured @ 180 C) (mg/L)	316	368	344	336	342	63	87	287	265	58	87	271	271
Total Suspended Solids (mg/L)	< 10	43	28	< 10	103	< 10	< 10	< 10	24	< 10	< 10	< 10	< 10
Water Temperature (°C) (fld)	14.9	8.1	6.6	11.3	7.5	11.2	6.1	10.2	9.3	7.4	5.8	10.4	8.2
Common Ions (mg/L)													
Total Alkalinity as CaCO3	268	297	274	282	278	35	64	263	258	52	69	263	257
Carbonate Alkalinity as CO3	8	< 4	< 4	6	< 4		< 4	< 4	< 4	< 4	< 4		
Bicarbonate Alkalinity as HCO3	310	362	334	331	339	43	78	320	309	63	84	321	314
Chloride (Cl)	1	1	1	1	1	< 1	< 1	1	< 1	< 1	< 1	< 1	< 1
Fluoride (F)	--	--	--	--	--	< 0.1	--	--	--	--	--	0.2	0.2
Total Hardness as CaCO3	278	274	296	261	310	31	59	256	254	50	69	259	247
Sulfate (SO4)	37	52	43	32	43	3	5	11	5	3	6	3	3
Nutrients (mg/L)													
Total Ammonia (NH3+NH4 AS N)	--	--	--	--	--	< 0.05	--	--	--	--	--	--	< 0.05
Total Kjeldahl Nitrogen as N	0.2	0.4	0.2	0.3	0.4	< 0.1	0.2	0.3	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Nitrogen as N	0.2	0.4	0.2	0.3	0.4	0.4	0.2	0.4	0.1	< 0.1	< 0.1	< 0.1	0.2
Nitrate + Nitrite as N	0.02	< 0.01	0.02	0.01	0.02	0.37	0.05	0.05	< 0.01	0.03	0.04	0.06	0.25
Total Phosphorus (P)	0.01	0.03	0.04	0.04	0.09	0.032	< 0.01	0.02	0.03	< 0.01	0.02	0.01	0.01
Metals (mg/L)													
Calcium (Ca) Dis	73	75	76	70	76	8	19	73	65	13	19	78	74
Cadmium (Cd) TRC	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Chromium (Cr) TRC	< 0.001	0.002	< 0.001	< 0.001	0.003	0.002	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001
Copper (Cu) TRC	< 0.001	0.003	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Lead (Pb) TRC	< 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
Magnesium (Mg) DIS	23	21	26	21	29	3	3	18	22	4	5	16	15
Nickel (Ni) TRC	< 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
Potassium (K) DIS	2	3	2	1	3	1	< 1	1	2	< 1	< 1	< 1	< 1
Sodium (Na) DIS	14	35	9	24	7	2	3	8	2	1	2	6	7
Zinc (Zn) TRC	0.004	0.013	0.004	< 0.002	0.008	0.003	0.006	0.01	0.005	< 0.002	0.005	< 0.002	0.006

No Meas = Not Measured

-- = Not Analyzed

3.0 SUMMARY

A spring and seep inventory was conducted at the site of the proposed Benbow Blitz Adit Breakout. Fieldwork was conducted in the Fat Tire Claim study area during late July and mid-August, 2011, after peak flow conditions and while weather was hot and dry. The Fat Tire Claim Addition was investigated in February 2012. Each spring and seep investigation included a detailed helicopter survey followed by exploration of all potential spring or seep sites by foot within the Study Area boundaries.

Six springs, four new creeks sites, and one seep were observed, inventoried, and sampled within or near the Study Area. Two established creek sites outside of the Study Area were also monitored and sampled as part of this project. Water from all the sampled sites is high quality and mostly calcium-bicarbonate type.

4.0 REFERENCES

Montana Department of Natural Resources and Conservation – Water Right Query System, 2011.
<http://nris.mt.gov/dnrc/waterrights/default.aspx>.

TerraServer Satellite Photographs, Aerial Photography, and Images www.TerraServer.com.

APPENDIX A
SITE DATA SHEETS

**STILLWATER MINING COMPANY
BENBOW BLITZ
SITE DATA SHEET**

SITE NAME:	Benbow Mill East Spring	SITE DESIGNATION:	BMESP
SITE ACCESS:	Head of Benbow Mill Creek East Fork; South side of the road.		
COUNTY/STATE:	Stillwater/MT	TYPE OF SITE:	Spring
LEGAL LOCATION:	T5S R16E SEC20AAC	MEASURED FLOW:	0.31 GPM
GPS LATITUDE:	W 109.77091	METHOD OF MEASUREMENT:	90° v-notch
GPS LONGITUDE:	N 45.38961	SAMPLE COLLECTED:	Y
		MEASURED BY:	WC, CL
		REMARKS:	



PHOTO DATE: 8/18/2011
TIME: 08:00

WATER QUALITY SAMPLE RESULTS

SITE: BMESP
DATE: 8/18/2011
TIME: 08:00
LAB: EL

GENERAL PARAMETERS:

SC (lab): 630
SC (fld): 417.1
PH (lab): 7.2
PH (fld): 8.3
TSS (mg/l): 43
TDS (mg/l): 368
Water Temp: 8.1

COMMON IONS (mg/L)

Total Hardness
as CaCO₃: 274
Ca: 75
Mg: 21
Na: 35
K: 3
Alkalinity as
CaCO₃: 297
CO₃: < 4
HC0₃: 362
SO₄: 52
Cl: 1

NUTRIENTS (mg/L)

Nitrate and Nitrite as N: < 0.01
Kjeldahl as N: 0.4
Total Nitrogen: 0.4
Phosphorous: 0.03

METALS (TRC) (mg/L)

Cd: < 0.0001 Pb: < 0.002
Cr: 0.002 Ni: < 0.005
Cu: 0.003 Zn: 0.013

**STILLWATER MINING COMPANY
BENBOW BLITZ
SITE DATA SHEET**

SITE NAME:	Benbow Mill Middle Spring	SITE DESIGNATION:	BMMSP
SITE ACCESS:	Approximately 6' above CMP culvert; sampled from about 4' off South side of the road.		
COUNTY/STATE:	Stillwater/MT	TYPE OF SITE:	Spring
LEGAL LOCATION:	T5S R16E SEC20ABA	MEASURED FLOW:	2.60 GPM
GPS LATITUDE:	W 109.77402	METHOD OF MEASUREMENT:	90° v-notch
GPS LONGITUDE:	N 45.39025	SAMPLE COLLECTED:	Y
		MEASURED BY:	WC, CL
		REMARKS:	



PHOTO DATE: 8/18/2011
TIME: 08:20

WATER QUALITY SAMPLE RESULTS

SITE: BMMSP
DATE: 8/18/2011
TIME: 08:20
LAB: EL

GENERAL PARAMETERS:

SC (lab): 568
SC (fld): 248.2
PH (lab): 7.8
PH (fld): 8.38
TSS (mg/l): 28
TDS (mg/l): 344
Water Temp: 6.6

COMMON IONS (mg/L)

Total Hardness
as CaCO₃: 296
Ca: 76
Mg: 26
Na: 9
K: 2
Alkalinity as
CaCO₃: 274
CO₃: < 4
HC0₃: 334
SO₄: 43
Cl: 1

NUTRIENTS (mg/L)

Nitrate and Nitrite as N: 0.02
Kjeldahl as N: 0.2
Total Nitrogen: 0.2
Phosphorous: 0.04

METALS (TRC) (mg/L)

Cd: < 0.0001 Pb: < 0.002
Cr: < 0.001 Ni: < 0.005
Cu: < 0.001 Zn: 0.004

**STILLWATER MINING COMPANY
BENBOW BLITZ
SITE DATA SHEET**

SITE NAME: Benbow Mill Site Creek **SITE DESIGNATION:** BMSCR
SITE ACCESS: Trail Rd#241414 of Benbow Road. 1.2 miles from Benbow Drainage between Prairie Dog and. Road. Cross the creek and take Little Rocky left 0.4 miles, park and walk 450 yards up drainage.

COUNTY/STATE:	Stillwater/MT	TYPE OF SITE:	Surface Water
LEGAL LOCATION:	T5S R16E SEC16CBC	MEASURED FLOW:	6.73 GPM
GPS LATITUDE:	W 109.76698	METHOD OF MEASUREMENT:	90 ⁰ v-notch
GPS LONGITUDE:	N 45.39622	SAMPLE COLLECTED:	Y
		MEASURED BY:	WC, CL
		REMARKS:	



PHOTO DATE: 08/17/2011
TIME: 14:55

WATER QUALITY SAMPLE RESULTS

SITE: BMSCR
DATE: 08/17/2011
TIME: 14:55
LAB: EL

GENERAL PARAMETERS:

SC (lab): 543
 SC (fld): 467.5
 PH (lab): 8.2
 PH (fld): 8.39
 TSS (mg/l): < 10
 TDS (mg/l): 316
 Water Temp: 14.9

COMMON IONS (mg/L)

Total Hardness
 as CaCO₃: 278
 Ca: 73
 Mg: 23
 Na: 14
 K: 2
 Alkalinity as
 CaCO₃: 268
 CO₃: 8
 HC0₃: 310
 SO₄: 37
 Cl: 1

NUTRIENTS (mg/L)

Nitrate and Nitrite as N: 0.02
 Kjeldahl as N: 0.2
 Total Nitrogen: 0.2
 Phosphorous: 0.01

METALS (TRC) (mg/L)

Cd: <0.0001 Pb: <0.002
 Cr: <0.001 Ni: <0.005
 Cu: <0.001 Zn: 0.004

**STILLWATER MINING COMPANY
BENBOW BLITZ
SITE DATA SHEET**

SITE NAME:	Prairie Dog Creek	SITE DESIGNATION:	PDCR
SITE ACCESS:	Prairie Dog Ck above confluence; take road #241417 down ridge to low saddle and hike west to drainage.		
COUNTY/STATE:	Stillwater/MT	TYPE OF SITE:	Surface Water
LEGAL LOCATION:	T5S R16E 17DBD	MEASURED FLOW:	9.42 GPM
GPS LATITUDE:	W 109.77335	METHOD OF MEASUREMENT:	90° v-notch
GPS LONGITUDE:	N 45.39660	SAMPLE COLLECTED:	Y
		MEASURED BY:	WC, CL
		REMARKS:	



PHOTO DATE: 8/17/11
TIME: 14:00

WATER QUALITY SAMPLE RESULTS

SITE: PDCR
DATE: 8/17/11
TIME: 14:00
LAB: EL

GENERAL PARAMETERS:

SC (lab): 492
SC (fld): 408.7
PH (lab): 7.9
PH (fld): 7.96
TSS (mg/l): < 10
TDS (mg/l): 287
Water Temp: 10.2

COMMON IONS (mg/L)

Total Hardness
as CaCO₃: 256
Ca: 73
Mg: 18
Na: 8
K: 1
Alkalinity as
CaCO₃: 263
CO₃: <4
HC0₃: 320
SO₄: 11
Cl: 1

NUTRIENTS (mg/L)

Nitrate and Nitrite as N: 0.05
Kjeldahl as N: 0.3
Total Nitrogen: 0.4
Phosphorous: 0.02

METALS (TRC) (mg/L)

Cd: < 0.0001 Pb: < 0.002
Cr: < 0.001 Ni: < 0.005
Cu: < 0.001 Zn: 0.01

**STILLWATER MINING COMPANY
BENBOW BLITZ
SITE DATA SHEET**

SITE NAME:	Prairie Dog Creek Spring	SITE DESIGNATION:	PDCRSP
SITE ACCESS:	Up drainage from Benbow Road into dense brush; sampled below confluence of small spring and main spring.		
COUNTY/STATE:	Stillwater/MT	TYPE OF SITE:	Spring
LEGAL LOCATION:	T5S R16E SEC17CDD	MEASURED FLOW:	3.41 GPM
GPS LATITUDE:	W 109.77911	METHOD OF MEASUREMENT:	90 ⁰ v-notch
GPS LONGITUDE:	N 45.39220	SAMPLE COLLECTED:	Y
		MEASURED BY:	WC, CL
		REMARKS:	



PHOTO DATE: 8/18/11
TIME: 09:20

WATER QUALITY SAMPLE RESULTS

SITE: PDCRSP
DATE: 8/18/11
TIME: 09:20
LAB: EL

GENERAL PARAMETERS:

SC (lab): 466
SC (fld): 395.9
PH (lab): 8
PH (fld): 8.38
TSS (mg/l): 24
TDS (mg/l): 265
Water Temp: 9.3

COMMON IONS (mg/L)

Total Hardness
as CaCO₃: 254
Ca: 65
Mg: 22
Na: 2
K: 2
Alkalinity as
CaCO₃: 258
CO₃: < 4
HC0₃: 309
SO₄: 5
Cl: < 1

NUTRIENTS (mg/L)

Nitrate and Nitrite as N: < 0.01
Kjeldahl as N: 0.1
Total Nitrogen: 0.1
Phosphorous: 0.03

METALS (TRC) (mg/L)

Cd: < 0.0001 Pb: < 0.002
Cr: < 0.001 Ni: < 0.005
Cu: 0.001 Zn: 0.005

**STILLWATER MINING COMPANY
BENBOW BLITZ
SITE DATA SHEET**

SITE NAME: Rocky Creek Site 1
SITE ACCESS: Rocky Creek below mine claims area.

SITE DESIGNATION: RCR-1

COUNTY/STATE: Stillwater/MT
LEGAL LOCATION: T5S R16E SEC16DCC
GPS LATITUDE: W 109.75531
GPS LONGITUDE: N 45.39284

TYPE OF SITE: Surface Water
MEASURED FLOW: 9.67 CFS
METHOD OF MEASUREMENT: Marsh McBinery
SAMPLE COLLECTED: Y
MEASURED BY: WC, CL
REMARKS:



PHOTO DATE: 8/18/11

TIME: 10:00

WATER QUALITY SAMPLE RESULTS

SITE: RCR-1
DATE: 8/18/11
TIME: 10:00
LAB: EL

GENERAL PARAMETERS:

SC (lab): 106
SC (fld): 91.4
PH (lab): 7.7
PH (fld): 8.4
TSS (mg/l): < 10
TDS (mg/l): 58
Water Temp: 7.4

COMMON IONS (mg/L)

Total Hardness
as CaCO₃: 50
Ca: 13
Mg: 4
Na: 1
K: < 1
Alkalinity as
CaCO₃: 52
CO₃: < 4
HC0₃: 63
SO₄: 3
Cl: < 1

NUTRIENTS (mg/L)

Nitrate and Nitrite as N: 0.03
Kjeldahl as N: < 0.1
Total Nitrogen: < 0.1
Phosphorous: < 0.01

METALS (TRC) (mg/L)

Cd: < 0.0001 Pb: < 0.002
Cr: 0.001 Ni: < 0.005
Cu: < 0.001 Zn: < 0.002

**STILLWATER MINING COMPANY
BENBOW BLITZ
SITE DATA SHEET**

SITE NAME: Swinecker Creek **SITE DESIGNATION:** SWNCR
SITE ACCESS: Sampled approximately 100 yards downstream of CMP spring where this drainage meets PDCR, it is dry at confluence.

COUNTY/STATE:	Stillwater/MT	TYPE OF SITE:	Surface Water
LEGAL LOCATION:	T5S R16E SEC17DBC	MEASURED FLOW:	11.22 GPM
GPS LATITUDE:	W 109.77770	METHOD OF MEASUREMENT:	90° v-notch
GPS LONGITUDE:	N 45.39706	SAMPLE COLLECTED:	Y
		MEASURED BY:	WC, CL
		REMARKS:	



PHOTO DATE: 8/17/11
TIME: 12:35

WATER QUALITY SAMPLE RESULTS

SITE: SWNCR
DATE: 8/17/11
TIME: 12:35
LAB: EL

GENERAL PARAMETERS:

SC (lab): 475
 SC (fld): 410.2
 PH (lab): 7.9
 PH (fld): 8.02
 TSS (mg/l): < 10
 TDS (mg/l): 271
 Water Temp: 10.4

COMMON IONS (mg/L)

Total Hardness
 as CaCO3: 259
 Ca: 78
 Mg: 16
 Na: 6
 K: < 1
 Alkalinity as
 CaCO3: 263
 CO3: 321
 HC03: 3
 SO4: < 1
 Cl: 0.2

NUTRIENTS (mg/L)

Nitrate and Nitrite as N: 0.06
 Kjeldahl as N: < 0.1
 Total Nitrogen: < 0.1
 Phosphorous: 0.01

METALS (TRC) (mg/L)

Cd: < 0.0001 Pb: < 0.002
 Cr: < 0.001 Ni: < 0.005
 Cu: < 0.001 Zn: < 0.002

**STILLWATER MINING COMPANY
BENBOW BLITZ
SITE DATA SHEET**

SITE NAME:	Swinecker Spring	SITE DESIGNATION:	SWNSP
SITE ACCESS:	Spring North of Forest Service Road developed by CMP housing development.		
COUNTY/STATE:	Stillwater/MT	TYPE OF SITE:	Spring
LEGAL LOCATION:	T5S R16E SEC17CAD	MEASURED FLOW:	2.14 GPM
GPS LATITUDE:	W 109.77913	METHOD OF MEASUREMENT:	Volumetric
GPS LONGITUDE:	N 45.39643	SAMPLE COLLECTED:	Y
		MEASURED BY:	WC, CL
		REMARKS:	



PHOTO DATE: 8/17/11
TIME: 12:15

WATER QUALITY SAMPLE RESULTS

SITE: SWNSP
DATE: 8/17/11
TIME: 12:15
LAB: EL

GENERAL PARAMETERS:

SC (lab): 473
SC (fld): 411.2
PH (lab): 7.4
PH (fld): 7.74
TSS (mg/l): < 10
TDS (mg/l): 271
Water Temp: 8.2

COMMON IONS (mg/L)

Total Hardness
as CaCO₃: 247
Ca: 74
Mg: 15
Na: 7
K: < 1
Alkalinity as
CaCO₃: 257
CO₃: 314
HC0₃: 3
SO₄: < 1
Cl: 0.2

NUTRIENTS (mg/L)

Nitrate and Nitrite as N: 0.25
Kjeldahl as N: < 0.1
Total Nitrogen: 0.2
Phosphorous: 0.01
Total Ammonia: < 0.05

METALS (TRC) (mg/L)

Cd: < 0.0001 Pb: < 0.002
Cr: < 0.001 Ni: < 0.005
Cu: < 0.001 Zn: 0.006

APPENDIX B
ANALYSIS SUMMARY REPORT

INDEX

Page	Site Code	Site Name	Site Type	Elevation MF	Well Depth
1	BMESP	Benbow Mill East Spring	Springs, Seeps, & Adits		
1	BMMSF	Benbow Mill Middle Spring	Springs, Seeps, & Adits		
2	BMSCR	BENBOW MILL SITE CREEK	Surface Water		
1	BMSP	BenBow Mill Spring	Springs, Seeps, & Adits		
1	BMSSP	BENBOW MILL SITE SEEP	Springs, Seeps, & Adits		
1	BMWSP	Benbow Mill West Spring	Springs, Seeps, & Adits		
2	PCR-1	Praire Dog Creek Site 1	Surface Water		
2	PDCR	Praire Dog Creek	Surface Water		
1	PDCRSP	Praire Dog Creek Spring	Springs, Seeps, & Adits		
2	RCR-1	Rocky Creek Site 1	Surface Water		
2	RCRT-2	Rocky Creek Tributary	Surface Water		
2	SWNCR	Swinecker Creek	Surface Water		
1	SWNSP	Swinecker Spring	Springs, Seeps, & Adits		

Sample Type: Springs, Seeps, & Adits

SITE CODE	BMESP	BMMSP	BMSP	BMSSP	BMWSP	PDCRSP	SWNSP
SAMPLE DATE	08/18/2011	08/18/2011	08/17/2011	08/17/2011	08/18/2011	08/18/2011	08/17/2011
SAMPLE TIME	08:00	08:20	16:30	15:00	08:45	09:20	12:15
LAB	EL	EL	EL	HYDRO	EL	EL	EL
LAB NUMBER	1108191008	1108191009	1108191006		1108191010	1108191011	1108191001
REMARKS				NO SAMPLE			
SAMPLE NUMBER	1108-BMESP	1108-BMMSP	1108-BMSP	1108-BMSSP	1108-BMWSP	1108-PDCRSP	1108-SWNSP

-- PHYSICAL PARAMETERS --

FLOW (cfs)	NO FLOW						
FLOW (gal/min)	0.31	2.6	1.93		5.35	3.41	2.14
PH (FLD)	8.3	8.38	8.29		8.05	8.38	7.74
PH	7.2	7.8	8.1		7.8	8.0	7.4
SC (UMHOS/CM AT 25 C)	630.0	568.0	559.0		573.0	466.0	473.0
SC (UMHOS/CM AT 25 C) (FLD)	417.1	248.2	469.1		448.1	395.9	411.2
TDS (MEASURED AT 180 C)	368.0	344.0	336.0		342.0	265.0	271.0
TOTAL SUSPENDED SOLIDS	43.0	28.0	<10.0		103.0	24.0	<10.0
WATER TEMPERATURE (FLD)	8.1	6.6	11.3		7.5	9.3	8.2

-- MAJOR CONSTITUENTS --

TOTAL HARDNESS AS CaCO3	274.0	296.0	261.0		310.0	254.0	247.0
CALCIUM (CA) DIS	75.0	76.0	70.0		76.0	65.0	74.0
MAGNESIUM (MG) DIS	21.0	26.0	21.0		29.0	22.0	15.0
SODIUM (NA) DIS	35.0	9.0	24.0		7.0	2.0	7.0
POTASSIUM (K) DIS	3.0	2.0	1.0		3.0	2.0	<1.0
TOTAL ALKALINITY AS CaCO3	297.0	274.0	282.0		278.0	258.0	257.0
CARBONATE ALKALINITY AS CO3	<4.0	<4.0	6.0		<4.0	<4.0	
BICARBONATE ALKALINITY AS HCO3	362.0	334.0	331.0		339.0	309.0	314.0
SULFATE (SO4)	52.0	43.0	32.0		43.0	5.0	3.0
CHLORIDE (CL)	1.0	1.0	1.0		1.0	<1.0	<1.0
FLUORIDE (F)							0.2

-- NUTRIENTS --

TOTAL AMMONIA (NH3+NH4 AS N)							<0.05
TOTAL KJELDAHL NITROGEN AS N	0.4	0.2	0.3		0.4	0.1	<0.1
NITRATE + NITRITE AS N	<0.01	0.02	0.01		0.02	<0.01	0.25
TOTAL NITROGEN AS N	0.4	0.2	0.3		0.4	0.1	0.2
PHOSPHORUS (P) TOT	0.03	0.04	0.04		0.09	0.03	0.01

-- METALS & MINOR CONSTITUENTS --

CADMIUM (CD) TRC	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
CHROMIUM (CR) TRC	0.002	<0.001	<0.001		0.003	<0.001	<0.001
COPPER (CU) TRC	0.003	<0.001	<0.001		0.002	0.001	<0.001
LEAD (PB) TRC	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002
NICKEL (NI) TRC	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005
ZINC (ZN) TRC	0.013	0.004	<0.002		0.008	0.005	0.006

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

Sample Type: Surface Water

SITE CODE	BMSCR	PCR-1	PDCR	RCR-1	RCRT-2	SWNCR
SAMPLE DATE	08/17/2011	08/17/2011	08/17/2011	08/18/2011	08/17/2011	08/17/2011
SAMPLE TIME	14:55	18:30	14:00	10:00	15:35	12:35
LAB	EL	EL	EL	EL	EL	EL
LAB NUMBER	1108191004	1108191007	1108191003	1108191012	1108191005	1108191002
SAMPLE NUMBER	1108-BMSCR	1108-PCR1	1108-PDCR	1108-RCR1	1108-RCRT2	1108-SWNCR

-- PHYSICAL PARAMETERS --

PARAMETER	BMSCR	PCR-1	PDCR	RCR-1	RCRT-2	SWNCR
FLOW (cfs)				9.67		
FLOW (gal/min)	6.73	144.51	9.42		42.19	11.22
PH (FLD)	8.39	8.05	7.96	8.4	7.9	8.02
PH	8.2	7.8	7.9	7.7	7.6	7.9
SC (UMHOS/CM AT 25 C)	543.0	134.0	492.0	106.0	147.0	475.0
SC (UMHOS/CM AT 25 C) (FLD)	467.5	112.6	408.7	91.4	125.6	410.2
TDS (MEASURED AT 180 C)	316.0	87.0	287.0	58.0	87.0	271.0
TOTAL SUSPENDED SOLIDS	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
WATER TEMPERATURE (FLD)	14.9	6.1	10.2	7.4	5.8	10.4

-- MAJOR CONSTITUENTS --

PARAMETER	BMSCR	PCR-1	PDCR	RCR-1	RCRT-2	SWNCR
TOTAL HARDNESS AS CaCO3	278.0	59.0	256.0	50.0	69.0	259.0
CALCIUM (CA) DIS	73.0	19.0	73.0	13.0	19.0	78.0
MAGNESIUM (MG) DIS	23.0	3.0	18.0	4.0	5.0	16.0
SODIUM (NA) DIS	14.0	3.0	8.0	1.0	2.0	6.0
POTASSIUM (K) DIS	2.0	<1.0	1.0	<1.0	<1.0	<1.0
TOTAL ALKALINITY AS CaCO3	268.0	64.0	263.0	52.0	69.0	263.0
CARBONATE ALKALINITY AS CO3	8.0	<4.0	<4.0	<4.0	<4.0	<4.0
BICARBONATE ALKALINITY AS HCO3	310.0	78.0	320.0	63.0	84.0	321.0
SULFATE (SO4)	37.0	5.0	11.0	3.0	6.0	3.0
CHLORIDE (CL)	1.0	<1.0	1.0	<1.0	<1.0	<1.0
FLUORIDE (F)						0.2

-- NUTRIENTS --

PARAMETER	BMSCR	PCR-1	PDCR	RCR-1	RCRT-2	SWNCR
TOTAL KJELDAHL NITROGEN AS N	0.2	0.2	0.3	<0.1	<0.1	<0.1
NITRATE + NITRITE AS N	0.02	0.05	0.05	0.03	0.04	0.06
TOTAL NITROGEN AS N	0.2	0.2	0.4	<0.1	<0.1	<0.1
PHOSPHORUS (P) TOT	0.01	<0.01	0.02	<0.01	0.02	0.01

-- METALS & MINOR CONSTITUENTS --

PARAMETER	BMSCR	PCR-1	PDCR	RCR-1	RCRT-2	SWNCR
CADMIUM (CD) TRC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
CHROMIUM (CR) TRC	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
COPPER (CU) TRC	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
LEAD (PB) TRC	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
NICKEL (NI) TRC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
ZINC (ZN) TRC	0.004	0.006	0.01	<0.002	0.005	<0.002

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

INDEX

+----- SAMPLE NUMBER ORDER -----+					+----- LAB NUMBER ORDER -----+				
Page	Sample Number	Lab ##	Date	Site Code	Page	Lab ##	Sample Number	Date	Site Code
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1	1108-BMMSP	1108191009	08/18/2011	BMMSP	1	1108191001	1108-SWNSP	08/17/2011	SWNSP
2	1108-BMSCR	1108191004	08/17/2011	BMSCR	2	1108191002	1108-SWNCR	08/17/2011	SWNCR
1	1108-BMSP	1108191006	08/17/2011	BMSP	2	1108191003	1108-PDCR	08/17/2011	PDCR
1	1108-BMSSP		08/17/2011	BMSSP	2	1108191004	1108-BMSCR	08/17/2011	BMSCR
1	1108-BMWSP	1108191010	08/18/2011	BMWSP	2	1108191005	1108-RCRT2	08/17/2011	RCRT-2
2	1108-PCR1	1108191007	08/17/2011	PCR-1	1	1108191006	1108-BMSP	08/17/2011	BMSP
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2	1108-RCR1	1108191012	08/18/2011	RCR-1	1	1108191009	1108-BMMSP	08/18/2011	BMMSP
2	1108-RCRT2	1108191005	08/17/2011	RCRT-2	1	1108191010	1108-BMWSP	08/18/2011	BMWSP
2	1108-SWNCR	1108191002	08/17/2011	SWNCR	1	1108191011	1108-PDCRSP	08/18/2011	PDCRSP
1	1108-SWNSP	1108191001	08/17/2011	SWNSP	2	1108191012	1108-RCR1	08/18/2011	RCR-1

