START 3

Superfund Technical Assessment and Response Team 3 – Region 8

United States
Environmental Protection Agency
Contract No. EP-W-05-050

FIELD ACTIVITIES REPORT
Mine Entry

RED AND BONITA MINE SITE
Silverton, San Juan County, Colorado

TDD No. 1008-01

December 14, 2012

URS
OPERATING SERVICES, INC.

In association with:
Garry Struthers Associates, Inc.
LT Environmental, Inc.
OTIE
TechLaw, Inc.
Tetra Tech EMI

FIELD ACTIVITIES REPORT
Mine Entry

RED AND BONITA MINE SITE
Silverton, San Juan County, Colorado

EPA Contract No. EP-W-05-050
TDD No. 1008-01

Prepared By:
Cordel Schmidt, P.G.
Project Manager

URS Operating Services, Inc.
999 18th Street, Suite 900
Denver, CO 80202-2409

Approved: _____ Date: 12-14-12
Steven Way, On-Scene Coordinator, EPA, Region 8

Approved: _____ Date: 12-14-12
Charles W. Baker, START 3 Program Manager, UOS

Approved: _____ Date: 12-14-12
Cordel Schmidt, Project Manager, START 3, UOS

This document has been prepared for the U.S. Environmental Protection Agency under Contract No. EP-W-05-050. The material contained herein is not to be disclosed to, discussed with, or made available to any person or persons for any reason without prior express approval of a responsible officer of the U.S. Environmental Protection Agency. In the interest of conserving natural resources, this document is printed on recycled paper and double-sided as appropriate.

DISTRIBUTION LIST

U.S. ENVIRONMENTAL PROTECTION AGENCY

Steven Way (2 copies)	On-Scene Coordinator, EPA Region 8

URS OPERATING SERVICES, INC.

Cordel Schmidt	Project Manager, START 3, EPA Region 8
File (2 copies)	START 3, EPA Region 8

FIELD ACTIVITIES REPORT
Mine Entry

RED AND BONITA MINE SITE
Silverton, San Juan County, Colorado

TABLE OF CONTENTS

		Page #
1.0	**INTRODUCTION**	**1**
2.0	**BACKGROUND**	**1**
3.0	**FIELD ACTIVITIES**	**2**
3.1	Design and Work Considerations	
3.2	Adit Preparations	
3.3	Mine Adit Drainage Filtration	
3.4	Waste Disposal	
3.5	Mine Adit Inspection	
3.6	Sampling Activities	
4.0	**FIELD ACTIONS AND OBSERVATIONS**	**5**
5.0	**REFERENCES**	**8**

FIGURES

Figure 1 Site Location

TABLES

Table 1 Sample Collection Summary, May 30 to June 14, 2012
Table 2 Total Metals Sample Data Summary, May 30 to June 14, 2012

APPENDICES

Appendix A Photolog
Appendix B Mine Entry Safety Plan
Appendix C Work Plan – Mine Adit Entry and Investigation
Appendix D Filtrate Disposal
Appendix E Laboratory Analytical Results

1.0 INTRODUCTION

URS Operating Services, Inc. (UOS), was tasked by the Environmental Protection Agency (EPA), under Superfund Technical Assessment and Response Team 3 (START) contract # EP-W-05-050, Technical Direction Document (TDD) No. 1008-01, to provide technical support to the Region 8 On-Scene Coordinator (OSC) at an abandoned mine site near Silverton, San Juan County, Colorado. Specifically, START was tasked to perform mine entry preparation activities, perform oversight activities during the performance of the mine entry activities, and to perform water sampling as appropriate. Field activities followed the applicable UOS Technical Standard Operating Procedures (TSOPs) and the Generic Quality Assurance Project Plan (UOS 2005a, b).

Field activities associated with (pre/post) entry into the Red and Bonita mine adit were performed during May 30 to July 6, 2012 by Frontier Environmental Services Company (FES) of Arvada, Colorado. Adit entry to inspect the physical condition of the adit was performed on June 6, 2012 by State of Colorado Division of Reclamation, Mining, and Safety (DRMS) personnel. The Red and Bonita Mine site is located along Cement Creek, approximately 10 miles north of the town of Silverton, Colorado, centered near 37.897236° north latitude and -107.64382° west longitude (Figure 1).

2.0 BACKGROUND

The Red and Bonita mine portal is approximately 0.5 mile north of Gladstone at 10,893 feet above mean sea level (AMSL). Road access is via County Road (CR) 110 from the town of Silverton to CR53 located at the abandoned town site of Gladstone. CR53 continues northward up the Cement Creek valley to other mines and also passes the base of the Red and Bonita mine (Figure1). The mine is accessible during non-snow months of the year, typically late June through early October.

Adit discharge has occurred through a collapsed portal for an unknown number of years until a new portal structure was installed in October 2011. Initial breach of the portal collapse into the adit occurred on September 15, 2011. The adit has been exposed to ambient conditions since then; however, the adit has been covered with a brattice cloth during the winter months to inhibit water from freezing inside the adit. Adit discharge flows overland across and approximately 200 feet down a mine dump face before being channelized at the toe of the dump. The channel directs flow into an iron bog en route to Cement Creek approximately 500 feet down gradient of the toe of the dump. Since 2009, adit discharge rates have been observed to range from 181 to 336 gallons per minute (gpm). The pH of portal discharge water typically averages 6.1standard units (SU) (UOS 2012).

The mine is in the Cement Creek watershed, which is a component of the upper Animas River watershed. These watersheds were the focus of both large- and small-scale mining operations that flourished beginning in 1871 and lasting until as late as 1991 (U.S. Geological Survey [USGS] 2007). Photo documentation of adit entry activities is included in Appendix A.

3.0 FIELD ACTIVITIES

3.1 DESIGN AND WORK CONSIDERATIONS

Preparation for field activities prior to mine adit entry by DRMS included acquiring supplies and equipment deemed necessary for safe entry into the adit and to manage water during the entry activity. Minimal information was available describing the conditions of this mine adit because it had not been entered for potentially 100 years; therefore, supply needs were estimated based on typical abandoned mine requirements. Conditions anticipated included stagnant air inside the adit based on prior air readings that indicated a depleted (19 percent) oxygen atmosphere. The mine entry crew was prepared for installation of 1,200 feet of ventilation piping to be used in conjunction with a mine ventilation fan capable of adding 15,000 cubic feet per minute (CFM) of outside air into the adit. Ventilation piping was to be added as necessary. Steel jacks and Douglas fir timber sets were available on site for support placement at weak areas inside the adit. Poly piping was available for directing mine discharge water from the adit, as well as other supplies and equipment to assist in the mine adit entry.

Because of the unique nature of this endeavor, FES and DRMS worked collectively to develop a Mine Entry Safety Plan (Appendix B) for entry and exploration of the mine adit. START also developed a Work Plan – Mine Adit Entry and Investigation (Appendix C).

3.2 ADIT PREPARATIONS

Preparations on site for entry included installing 6-inch PVC piping (for directing mine adit discharge water) from the top of the mine waste dump down the face to the base of the dump into the filter bag manifold system, placing equipment for the ventilation of the mine, and performing modifications to the portal door to pass a ventilation bag through the secured entrance door. The initial concept for reducing the disturbance of precipitates in the mine included placing an 8-inch diameter pipe on the floor of the adit to channel flow, and to build a temporary wooden platform over the top of the piping to support personnel while entering the mine. After several attempts to install these materials, it was determined that it was not sufficiently effective in reducing the amount of precipitated solids from being discharged to the filter bag system, and the level of

effort and time required was significant. Ventilation bag was ultimately hung for approximately 220 feet into the adit and air was blown into the mine with a 10,000-CFM capacity fan before and during the entry events.

3.3 MINE ADIT DRAINAGE FILTRATION

The approximately 300 gpm mine adit drainage required a water-handling approach that would allow uninhibited mine entry by personnel and equipment while also disallowing release of yellowboy sediments carried by the flowing water. Due to site access restriction by adjacent land owners and limited space at the mine property, it was not possible to install a settling pond sufficiently large to settle the suspended solids. Therefore, a process to remove disturbed sediment from the mine drainage as adit work was performed was put in place prior to mine entry activities. This process mimicked the water filtration process used during removal of the portal collapse in 2011.

Mine drainage water was filtered during adit entry activities via a filter bag manifold system located at the north toe of the mine dump adjacent to CR53 within the road right-of-way and bags placed on the culverts conveying the water under CR 53. The water was directed through 6-inch PVC piping to a filter bag manifold system where the flow volume could be manipulated at four filter bags via dedicated valving. An aluminum sulfate flocculent was added to the mine drainage water at a point on top of the dump, allowing for thorough mixing within the PVC piping prior to entry into the filter bags below. Flocculent was required to coagulate yellow boy fines into larger masses so as to not saturate the filter bag walls and cause a "blinding" effect that prevented water from draining through the bags.

The "Dandy De-Watering Bag®" filter bags were sized 15x15 feet to enable handling after use. The bags were constructed of 8-ounce non-woven geotextile fabric and had pore openings of 0.0180 millimeters (mm) (18 micrometers [μm]) and were replaced as needed. In addition, filter bags were attached to the ditch culverts located on CR53 to provide backup filtration to the primary (manifold) filter system prior to release of mine drainage water to Cement Creek.

3.4 WASTE DISPOSAL

Spent filter bags containing filtrate, including those stored at the site since 2011, were transported to the Bondad Landfill in Durango, Colorado, for disposal. Twenty cubic yards of bags/filtrate were delivered to the landfill on July 13, 2012. A scale was also used at the site to measure the

tonnage of filtrate shipped to the landfill; 1 to 2 tons from Fall 2011 activities, and 5 to 6 tons from Summer 2012 activities. The waste profile form, non-hazardous waste shipping manifest, and filtrate laboratory analysis for disposal are included in Appendix D. The filtrate is not a Resource Conservation and Recovery Act (RCRA) hazardous waste, and analyses were performed to evaluate hazardous characteristics and other chemical hazards. It was necessary to remove the spent bags from the site because there is insufficient space for long-term storage of the bags at the dump site without significant site disturbance.

3.5 MINE ADIT INSPECTION

Mine adit inspection was performed by DRMS mining personnel. Their work activities and observations are included under separate reporting from their office, currently unavailable for inclusion in this report.

3.6 SAMPLING ACTIVITIES

Various sampling activities were performed to determine current conditions, and to establish background site conditions. Laboratory analytical results are included in Appendix E. Sampling locations included:

- Mine drainage waters inside the mine portal;
- Fracture water inflow into the mine adit at 275 feet inby;
- Mine drainage waters at the toe of the mine dump;
- Filter bag release water;
- Cement Creek water below the site area, but above the American Tunnel drainage confluence;
- Animas River water below the town of Silverton at the A72 sample location;
- Mine dump material;
- Red-colored yellowboy precipitate from the "weathered" mine dump face, "unweathered" red-colored yellowboy inside the adit, and recently deposited yellow-orange-colored yellowboy from the dump face and the ditch below the mine dump; and
- Solids precipitated from mine drainage filtering activities within filter bags.

Field observations for pH, specific conductivity, and temperature were also monitored for all water sampling. A summary of samples is included in Table 1.

4.0 FIELD ACTIONS AND OBSERVATIONS

A crew of five personnel entered the mine adit on June 5 and 6 to hang vent pipe on the adit walls and to perform inspection of adit conditions. Only two men performed full entry; others were stationed as safety and assistance personnel. Entry timeframes were approximately 2 hours on June 5, and approximately 5 hours on June 6. Yellowboy precipitation that had accumulated on the adit floor 1 to 3 feet deep, as well as nearly waist-deep water in areas, inhibited activities to the extent of the mine entry of 680 feet inby. Yellowboy was problematic because as the entry teams travelled inward they had to wade through the yellowboy accumulation, which would become agitated and release into the mine adit drainage water that flows perennially at approximately 300 gpm, consequently loading the water filtration system outside the adit. Yellowboy accumulation was observed to thin to approximately 1 foot thick at 280 feet inby, and varied from 0.5 to 3 feet thick beyond that point. The adit investigation was terminated early due to the accumulation of yellowboy and the difficulties it caused with loading of the water filtration system. An additional adit entry will be required to investigate the adit in its entirety. A more effective filtration system will also be required for future mine entries.

Adit conditions to 680 feet inby were reported to be very good with regard to rock competency. There were no support structures observed, with the exception of minor support near the mine entrance where the portal is installed into a ferricrete deposit. No support structures were added beyond the replaced portal in 2011. There was also none to very little mineralization observed on the adit walls by the entry crew, although a portion of the walls and floor were under water or covered with yellowboy. Lay-flat vent pipe was left intact in the mine adit from the portal to 200 feet inby.

Mine adit drainage pH measurements have been observed to be fairly consistent, averaging 6.1 SU (19 measurements during 2009-2011) (UOS 2012), and 6.3 SU (12 measurements during summer 2012) (Table 1). However, a pH of 4.2 was observed on August 23, 2012, and is not fully understood at this time. Also, the typically dark red-colored yellowboy precipitate that was deposited on the dump face by the mine drainage (and the color observed inside the mine adit) was observed to have altered to a light orange to yellowish color in the early spring of 2012. The dark red and light orange to yellowish color variations were also observed on the mine adit walls during these activities. Yellowboy precipitate is known to exist in color variations of red, black, orange, and yellow.

Three samples of yellowboy precipitate, including the red and yellow-orange color variations observed on site, were analyzed by a laboratory for Total Metals. The "unweathered" red-colored yellowboy from within the mine adit contained significantly more metals overall than both the yellow-orange colored

sample recently deposited on the dump face, and the "weathered" red-colored sample. All metals observations varied widely for each sample, with the exception of iron which was present at 46 percent within both red-colored samples, and was observed at 10 percent in the yellow-orange-colored sample, which may offer an explanation for the color differences.

Flow rates in the Animas River below the town of Silverton pre-and post-mine entry were measured at 269,748 gpm (May 15) and 272,441 gpm (June 6), a less than 1 percent difference (USGS 2012). Flow within Cement Creek at the town of Silverton (June 6) was 27,379 gpm (USGS 2012), approximately 10 percent of the Animas River flow. Various (total) metals occurrences within the Animas River for those time periods are compared here; i.e., aluminum, copper, iron, lead, and zinc. Mercury was also investigated but was observed to not be included on the analyte list during pre-mine entry activities in the Animas River and Cement Creek (EPA 2012); therefore, full comparisons could not be made for those locations. A summary of the analytical data is included in Table 2. Mercury observations at the CR53 culvert location (CC03D) at the mine site did, however, increase from non-detect to as much as 0.667 parts per billion (ppb) in the mine water at that location during mine entry activities, and decreased to non-detect after the mine entry. Mercury was not detected at the town site of Gladstone (sample location CCGS located below the mine site) at the time of mine entry activities.

As anticipated, the metals load within mine drainage water at the mine site (CR53 culvert sample location CC03D) increased upon mine adit entry. However, the metals content was observed to only be slightly greater than pre-entry conditions at the down gradient Cement Creek sample location CCGS (June 6), where metals were observed to increase by typically 10 to 20%. The average lead observation however, was observed to increase by a factor of 2.2. Mercury was non-detect. Analytical results for the comparison metals are summarized in Table 2. Laboratory analysis data sheets (Form 1's) for all metals are included in Appendix E.

In addition to Total Metals analysis, two samples (CC03CA, CC03D), were also analyzed for Dissolved Metals, post entry sample on June 14. The dissolved metals observations generally mimic total metals results at those locations within acceptable limits; the exception being dissolved lead, which is significantly lower than total lead concentrations.

When June 6 and May 15 sample data from the Animas River (location A72) are compared, the comparison metals are observed to be present in lesser amounts after the mine entry activities by 4%, 19%, 27%, 2 %, and 36 %, respectively. Mercury was non-detect post-activities. Note that the June 6, 2012, Animas River comparison analysis included three samples spaced over a 1-hour time frame, with

the time of acquisition estimated to allow for potential contaminant influence, post-mine entry, to reach the sampling location.

5.0 REFERENCES

U.S. Environmental Protection Agency (EPA). 2012. Scribe.net/upper animas sample data database. October, 2012.

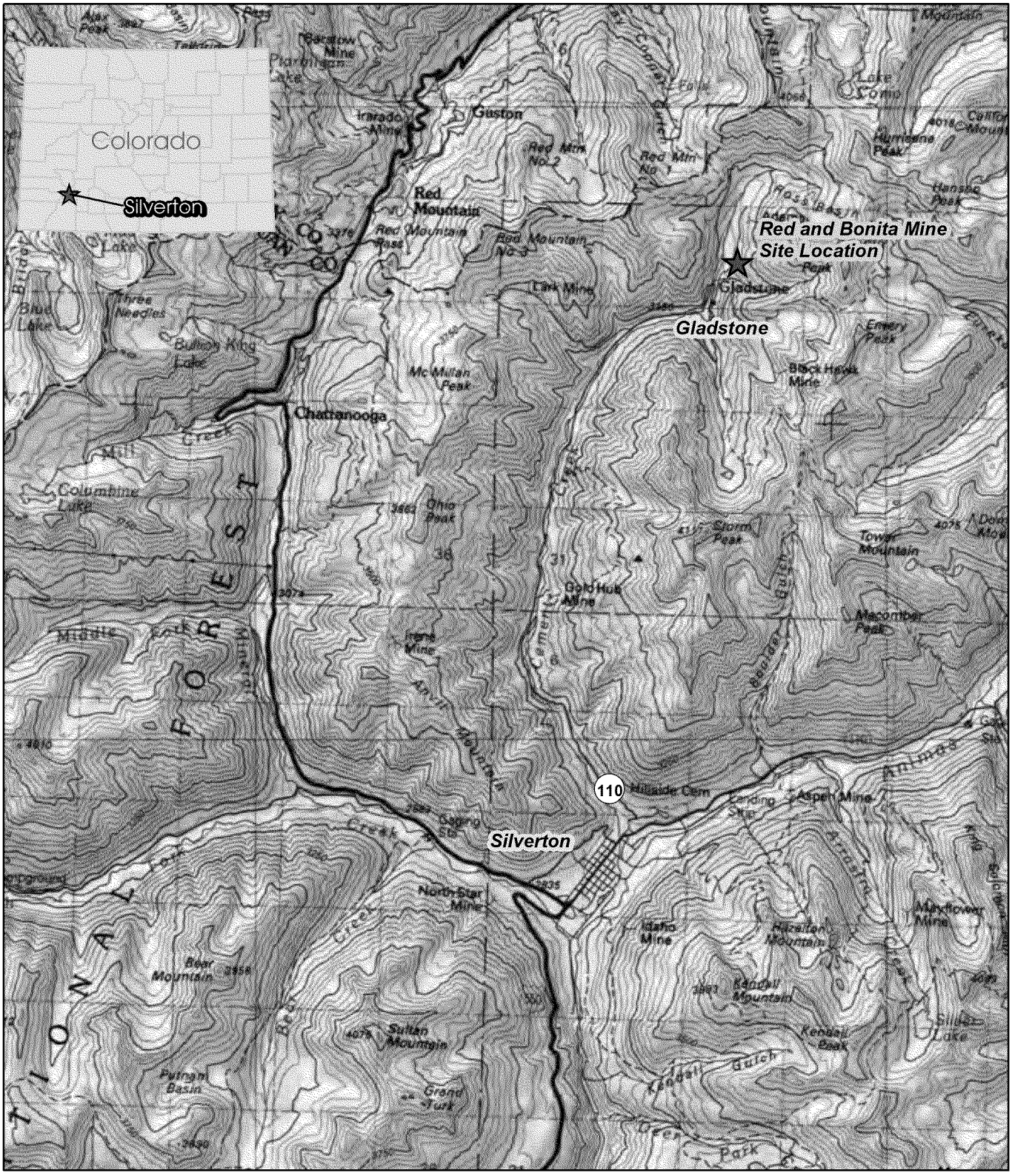
U.S. Geological Survey (USGS). 2007. Integrated Investigations of Environmental Effects of Historical Mining in the Animas River Watershed, San Juan County, Colorado. Church, S. E., Guerard, P.V., and Finger, S.E. eds. USGS Professional Paper 1651.

URS Operating Services, Inc. (UOS). 2012. "Water Quality Report – Four Mines Within Cement Creek Watershed," August 27, 2012.

URS Operating Services, Inc. (UOS) 2005a. "Emergency Response Program Generic Quality Assurance Project Plan." June 13, 2005.

URS Operating Services, Inc. (UOS). 2005b. "Technical Standard Operating Procedures for the Superfund Technical Assessment and Response Team (START), EPA Region 8." September 2005.

United States Geologic Survey (USGS). 2012. "USGS Surface Water Daily Data for Colorado." http://waterdata.usgs.gov/nwis/dv?cb_00060=on&format=html&period=&begin_date=2012-05-10&end_date=2012-06-20&site_no=09359020&referred_module=sw



Projection System:
Universal Transverse
Mercator Zone 13 North
North American Datum 1983

N

1 inch Page Size: 8.5 x 11

TDD Title: **Red and Bonita Mine**

Figure: 1

Figure Title: Site Location Map

TDD County: San Juan
TDD State: CO

TDD: 1008-01
Date: 11/2012

URS OPERATING SERVICES

Sources:
Arcservices World Topmap

Author: Jeremiah_Ervin Date/Time: Friday, November 16, 2012 11:38:59 AM File: C:\temp\r&b\Figure1_SiteLoc.mxd

Table 1
Red and Bonita Mine Site - Sample Collection Summary, May 30 to June 14, 2012

Date	Time	Laboratory Sample Number	Analysis	Comment	pH (SU)	Conductivity (µS)	Temperature (C)
5/30/2012	1002	cc03ca0530121002	Total Metals	Mine drainage at portal.	6.08	2,390	5.9
5/30/2012	1030	cc03cd0530121030	Total Metals	Mine drainage at CR53 culvert outfall.	6.65	2,260	7.2
5/30/2012	1641	cc03cd0530121641	Total Metals	Mine drainage at CR53 culvert outfall.	6.71	1,683	9.6
5/30/2012	1704	cc03ca0530121704	Total Metals	Mine drainage at portal.	6.07	1,783	5.9
5/31/2012	1048	--	--	Mine drainage at CR53 culvert outfall.	6.04	1,680	8.1
5/31/2012	1034	--	--	Red and Bonita mine drainage at Cement Creek confluence.	5.95	1,617	8.7
5/31/2012	1100	--	--	Mine drainage at portal.	6.07	1,770	5.9
5/31/2012	1652	ppt010521121652	Total Metals	Red colored yellowboy precipitate inside mine portal.	--	--	--
6/1/2012	1130	ppt020601121130	Total Metals	Red colored yellowboy precipitate on top of dump face.	--	--	--
6/1/2012	1135	dump010601121135	Total Metals	6-aliquot sample down dump face (no precipitate).	--	--	--
6/1/2012	1210	ppt030601121210	Total Metals	White colored precipitate from lower dump and CR53 ditch.	--	--	--
6/1/2012	1305	--	--	Mine drainage at portal. Dissolved oxygen = 59.3%, 7.36mg/L.	--	--	6.1
6/1/2012	1358	--	--	CR53 culvert. Dissolved Oxygen = 70.7%, 8.24mg/L.	--	--	8.7
6/5/2012	825	--	--	CR53 culvert. Dissolved Oxygen = 69.3%, 8.81mg/L.	6.6	1,707	5.1
6/5/2012	900	--	--	Mine drainage at portal. Dissolved oxygen = 51.6%, 7.16mg/L.	6.3	1,766	5.9

Table 1
Red and Bonita Mine Site - Sample Collection Summary, May 30 to June 14, 2012

Date	Time	Laboratory Sample Number	Analysis	Comment	pH (SU)	Conductivity (µS)	Temperature (C)
6/5/2012	1355	cc03ca0605121355	Total Metals	Mine drainage at portal.	--	--	--
6/5/2012	1519	--	--	In adit, 60 feet inby. Ambient Oxygen = 19.7%,	--	--	--
6/5/2012	1740	cc03d0605121740	Total Metals	Mine drainage at CR53 culvert outfall.	--	--	--
6/6/2012	956	--	--	Cement Creek above American Tunnel confluence.	4.46	400	4.2
6/6/2012	1004	ccgs0606121004	Total Metals	Cement Creek above American Tunnel confluence.	--	--	--
6/6/2012	1023	cc03d0606121023	Total Metals	Red and Bonita mine drainage at CR53 culvert outfall.	5.33	1,734	7.4
6/6/2012	1043	ccfb0606121043	Total Metals	Release water from filter bag, manifold area at toe of dump.	6.19	1,720	6.6
6/6/2012	1255	ccgs0606121255	Total Metals	Cement Creek above American Tunnel confluence.	4.26	436	10.7
6/6/2012	1745	a720606121745	Total Metals	Animas River gauging station (A72) below Silverton.	7.05	1,716	13.1
6/6/2012	1825	a720606121825	Total Metals	Animas River gauging station (A72) below Silverton.	--	--	--
6/6/2012	1845	a720606121845	Total Metals	Animas River gauging station (A72) below Silverton.	--	--	--
6/7/2012	1100	--	--	Cement Creek *below* confluence with Red and Bonita drainage.	6.3	406	6.7
6/7/2012	100	--	--	Cement Creek *above* confluence with Red and Bonita drainage.	6.48	196	6.6

Table 1
Red and Bonita Mine Site - Sample Collection Summary, May 30 to June 14, 2012

Date	Time	Laboratory Sample Number	Analysis	Comment	pH (SU)	Conductivity (µS)	Temperature (C)
6/7/2012	1100	--	--	Red and Bonita mine drainage at Cement Creek confluence.	6.27	1,598	9.6
6/7/2012	1235	--	--	Mine drainage at portal. Dissolved oxygen = 58.2%, 7.25mg/L.	6.62	1,735	5.9
6/7/2012	1430	adit2750606121430	Total Metals	Fracture flow into adit 275 to 283 feet inby.	--	--	--
6/14/2012	1121	ppt040614121121	Total Metals	Precipitate from filter bag, manifold area at toe of dump.	--	--	--
6/14/2012	1206	cc03ca0614121206	Total Metals Dissolved Metals	Mine drainage at portal. Dissolved oxygen = 58.3%, 7.26mg/L.	6.37	1,575	5.9
6/14/2012	1220	cc03d0614121220	Total Metals Dissolved Metals	CR53 culvert. Dissolved Oxygen = 70.1%, 8.19mg/L.	6.9	1,557	8.5

SU Standard Units
µS Micro Seimens
C Degrees Centigrade
-- Not applicable

Table 2
Total Metals Sample Data Summary*
micrograms per liter (µg/L)

Sample Identifier	Sample Location	Sample Date				
		5/15/2012	5/30/2012	6/5/2012 (Mine Entry)	6/6/2012 (Mine Entry)	6/14/2012
ALUMINUM						
CC03CA	inside portal		4290/4280	17100		4300
CC03D	CR53 culvert		4930/4470	21700	9560	4030
A72	Animas River	701			647/700/672	
ADIT275	275 feet inby adit				11500	
CCFB	filter bag release water				4670	
CCGS	Cement Ck at Gladstone, 20 ft above American Tunnel confl.				2160/2440	
CC18b	Cement Ck below North Fork, above American Tunnel	2290				
COPPER						
CC03CA	inside portal		8.49/7.07	214		8.36
CC03D	CR53 culvert		8.81/9.53	348	140	11.4
A72	Animas River	12.2			9.56/9.96/9.99	
ADIT275	275 feet inby adit				17.5	
CCFB	filter bag release water				8.46	
CCGS	Cement Ck at Gladstone, 20 ft above American Tunnel confl.				157/155	
CC18b	Cement Ck below North Fork, above American Tunnel	176				

Table 2
Total Metals Sample Data Summary*
micrograms per liter (µg/L)

Sample Identifier	Sample Location	Sample Date				
		5/15/2012	5/30/2012	6/5/2012 (Mine Entry)	6/6/2012 (Mine Entry)	6/14/2012
IRON						
CC03CA	inside portal		89500/89000	470000		91400
CC03D	CR53 culvert		92900/89800	691000	132000	85100
A72	Animas River	1280			914/950/935	
ADIT275	275 feet inby adit				94600	
CCFB	filter bag release water				88300	
CCGS	Cement Ck at Gladstone, 20 ft above American Tunnel confl.				6220/11200	
CC18b	Cement Ck below North Fork, above American Tunnel	7910				
LEAD						
CC03CA	inside portal		77.7/77.9	1410		82.7
CC03D	CR53 culvert		109/93.9	2330	361	103
A72	Animas River	4.27			3.55/4.15/4.89	
ADIT275	275 feet inby adit				152	
CCFB	filter bag release water				39.1	
CCGS	Cement Ck at Gladstone, 20 ft above American Tunnel confl.				26.4/35.4	
CC18b	Cement Ck below North Fork, above American Tunnel	14				

Table 2
Total Metals Sample Data Summary*
micrograms per liter (µg/L)

Sample Identifier	Sample Location	Sample Date				
		5/15/2012	5/30/2012	6/5/2012 (Mine Entry)	6/6/2012 (Mine Entry)	6/14/2012
MERCURY						
CC03CA	inside portal		u/0.044	0.368		u
CC03D	CR53 culvert		u/u	0.667	0.043	u
A72	Animas River	not analyzed			u/u/u	
ADIT275	275 feet inby adit				u	
CCFB	filter bag release water				u	
CCGS	Cement Ck at Gladstone, 20 ft above American Tunnel confl.				u/u	
CC18b	Cement Ck below North Fork, above American Tunnel	not analyzed				
ZINC						
CC03CA	inside portal		14000/14000	15800		13900
CC03D	CR53 culvert		14200/14200	15400	14800	13100
A72	Animas River	292			186/186/181	
ADIT275	275 feet inby adit				15600	
CCFB	filter bag release water				13700	
CCGS	Cement Ck at Gladstone, 20 ft above American Tunnel confl.				2070/2460	
CC18b	Cement Ck below North Fork, above American Tunnel	2980				

U Not detected at instrument detection limit.
*Data compendium from Appendix E.

APPENDIX A

Photolog

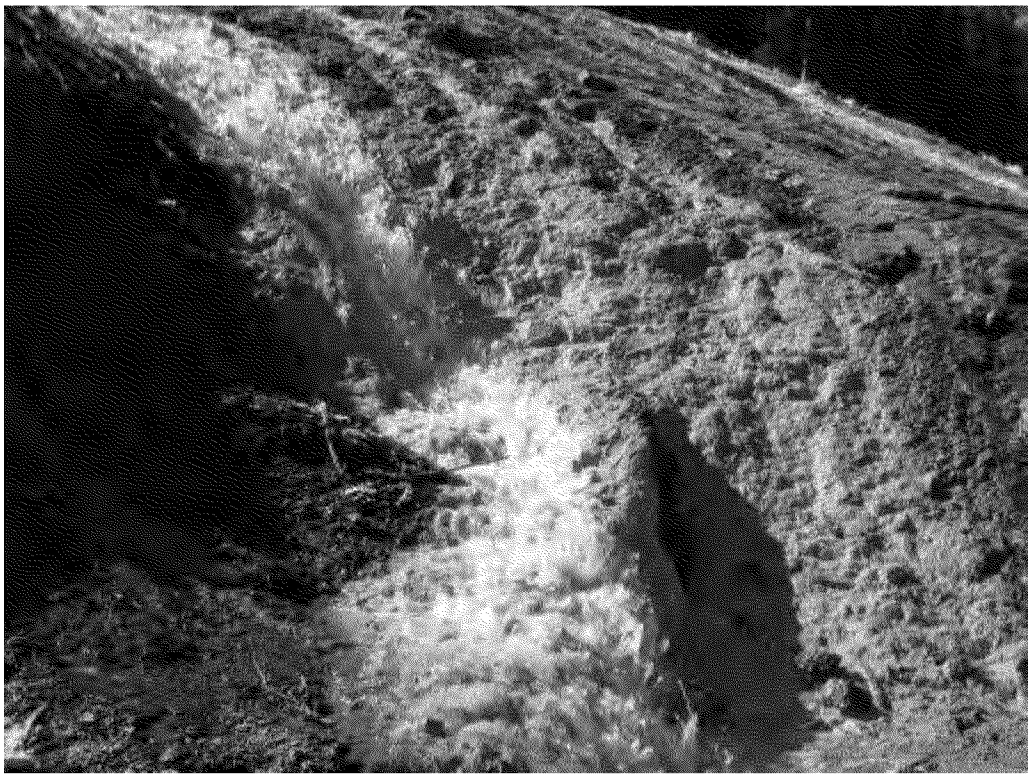


PHOTO 1
5-31-12. Yellow-orange and red colored iron precipitate on dump face, flowing mine drainage.

PHOTO 2
6-6-12. Mine adit entry preparation by Colorado Division of Reclamation Mining and Safety.

PHOTO 3
6-12-12. Mine portal after adit entry.

PHOTO 4
6-5-12. Temporary dam inside portal in attempt to control mine drainage. Yellowboy accumulation in foreground.

PHOTO 5
6-6-12. View from top of mine dump toward manifolded filter bags.

PHOTO 6
6-6-12. Aluminum sulfate flocculent added to pipe transmitting drainage to filter bags.

PHOTO 7
6-6-12. Filter bag located on top of dump near portal. Intermittently used. Draining to ditch on south side of mine dump.

PHOTO 8
6-6-12. Filter bag at base of mine dump. Note visibly clear release water.

PHOTO 9
5-31-12. Secondary filter bag placed on ditch culvert pipe on CR53 below mine.

PHOTO 10
6-14-12. Instrumentation used to obtain water parameter observations.

PHOTO 11
6-7-12. Temporary walkway inside mine adit as viewed from mine portal, placed above yellowboy accumulation. Note that adit is passing through ferricrete deposit, photo top.

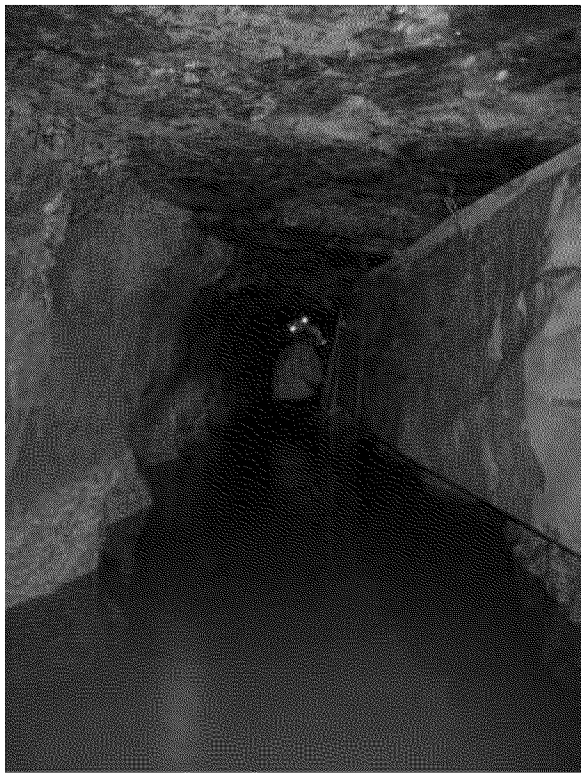


PHOTO 12
6-12-12. Securing collapsible air duct in adit approximately 100 feet inby. Note that adit appears competent, no required supports through andesitic rock.

PHOTO 13
6-12-12. Adit left rib at approximately 60 feet inby. Note yellowboy stain and accumulation near (current) water line.

PHOTO 14
6-12-12. Adit back at approximately 60 feet inby. Note competent andesitic rock and fracture planes.

PHOTO 15
6-12-12. Yellowboy accumulation in adit at (current) water line, approximately 50 feet inby. Note red, orange, yellow colors.

PHOTO 16
6-14-12. Sampling clay-like filtrate from filter bag.

PHOTO 17
7-13-12. Loading spent filter bags for landfill disposal.

PHOTO 18
7-13-12. KoirLog erosion control barriers placed at culvert outfalls. Two culverts under CR53 below the Red & Bonita mine. Overland flow is toward Cement Creek.

PHOTO 19
7-13-12. Mine portal area, post adit entry activities.

PHOTO 20
7-13-12. Mine portal area, post adit entry activities. Water discharge flowing over top of mine dump.

PHOTO 21

7-13-12. Red & Bonita mine, post adit entry activities. Mine drainage over dump face, drain pipe to manifolded filter bag area left in place for future use.

APPENDIX B

Mine Entry Safety Plan

Red and Bonita Mine Entry Safety Plan

May 27, 2012

Prepared by:

Allen Sorenson
Colorado Inactive Mine Reclamation Program

1816828 ED_000552_00024465-00033

The Red and Bonita underground mine workings along Cement Creek north of the town of Silverton Colorado will be entered June 4-8, 2012 to conduct surveys and collect water samples. Work under this plan will include safety measures necessary to support the primary mission(s). Underground activities may include ventilation, scaling, shoring, erection of safety barricades or warning tape, removal of obstacles that can be moved by hand, etc. This site-specific safety plan is limited to the entry of horizontal or slightly inclining adit features of the Red and Bonita mine.

Exclusion: The scope of this safety plan does not include entry into steeply inclined or vertical openings, from either above or below. This plan does not cover substantial mine rehabilitation activities such as mechanized mucking, major debris removal, or rock bolting. Should conditions be such as to require any these measures, a supplemental safety analysis and revision to this safety plan will be required.

Confined Space Issues: The mine workings at the Red and Bonita mine facility have not been inspected by competent persons or maintained for decades. This safety plan for survey and sampling support work in specific mine areas will provide measures which generally correspond to and are substantively equivalent to OSHA Confined Space requirements. Variations from OSHA Confined Space protocols may be made with consideration of specific site conditions and as adapted to consider the large distances and specific geometry of the mine adit layout as well as industry practices and regulations more specifically developed to address underground mine conditions, including MSHA regulations.

Areas which have been inspected and cleared of hazards may be downgraded from OSHA Confined Space-equivalent protocols, following additional reconnaissance.

Other Standards: Provisions of MSHA (40 CFR Parts 48, 56 and 57) standards pertaining to underground hardrock mining are not legally applicable to an inactive mine site, but in many cases are more detailed and fit site conditions better than OSHA regulations. MSHA standards will be regarded as supplemental references for this work, and safety measures customary to underground work will be followed.

OSHA Underground Construction standards (29 CFR 1926.800) may be applicable to any underground work other than simple observation, measurement, etc. This may include work to correct hazards, obtain samples of geologic material larger than hand specimens, etc.

1) Analysis of Potential Hazards / Mitigation Measures / Limiting Conditions

The following hazards are considered relatively high probability risks which need analysis and mitigation. There may be the possibility of lower probability or unforeseen risks, and this analysis does not cover all possible hazards.

2.1 Raise / Winze / Decline Work Hazards

The adit levels to be explored may have connections to upper and lower levels. Initial reconnaissance will be deliberate with continuous observation and probing to determine the locations of raises, winzes, and declines, if any exist. Hazards identified during initial reconnaissance will be marked or cordoned off, and will be avoided during the conduct of the work.

2.2 Falling Rock or other debris

The first person in the lead during each entry will evaluate the hazards and examine the geologic conditions and the condition of supports. Indications of air-slacked ground, rotten or collapsing timber sets or new rockfalls are indications of potential hazards. All entrants will maintain continuous awareness of roof and rib conditions. Any condition indicating that the adit is seriously unstable, or other debris hazards which cannot be removed or mitigated, will constitute grounds for withdrawal under this plan and the development of a supplemental plan.

2.3 Atmospheric Hazards

Oxygen Deficiency: The adit workings are known to have an oxygen-deficient atmosphere. The adit will be ventilated by forced air as necessary throughout the conduct of the work. The adequacy of at least 19.5% oxygen will be tested before entry, and a continuous multi-gas alarm, which includes oxygen, will be carried at all times by at least the lead person underground. Any persistent alarm will be grounds for withdrawal.

If the oxygen content is below 19.5% or at the first sign of symptoms from bad air inhalation (i.e., headache, dizziness, slurred speech, nausea, etc.) in any team member the reconnaissance will halt and the crew will leave the mine immediately.

Continuous oxygen level meters occasionally become unreliable at high elevations. The oxygen meter should be re-set for fresh air at the work area elevation.

The initial entry to any unventilated adit will not be performed on a day with a rapidly falling barometric pressure, to reduce the likelihood of hazardous gases emanating from old workings.

The exploration team will be cognizant of the possibility of stratified air in dead ended or shaft workings, with possible concentrations of Carbon Dioxide (CO_2)

along the adit floor. Although not poisonous, CO_2 kills by excluding oxygen. CO_2 tends to accumulate in low spaces without air movement because it is 1.5 times heavier than air.

Any areas with oxygen insufficiency detected will be marked on the mine map by the reconnaissance team, avoided, and marked off with "danger" tape.

Explosive gases: Methane accumulations are not likely in the Red and Bonita mine, and methane was not historically reported in the district.

Methane is explosive in normal air mixtures within the 5.5% to 15% range of concentration.

Methane is lighter than air, with specific gravity of 0.555. As a result, it tends to accumulate in high places in areas of poor ventilation. Methane concentrations should be tested in any areas which have little or no air movement. This testing should be performed as high up as possible, preferably within 1 foot of the mine roof. A lift device may be necessary to perform these tests.

MSHA standards for gassy or potentially gassy mines will be used as a limiting condition of operation. Any areas with methane concentrations in excess of 1% will not be explored further. If any area is found to have in excess of 2%, withdrawal from the entire mine will be indicated until ventilation can be provided or natural ventilation improved by opening additional doors.

Toxic Gases: There is a potential risk of hydrogen sulfide (H_2S) due to liberation from standing pools of water. H_2S can be recognized as the smell of rotten eggs, although at concentrations over 300 ppm the nasal receptors are quickly saturated and the smell will seem to disappear within a few breaths. H_2S will be tested and any measurement over 20 ppm will be grounds for withdrawal.

There is some possibility of Carbon Monoxide (CO). especially if diesel powered equipment is operated in a poorly ventilated space. CO will be continuously monitored while mobile equipment is being operated. A condition of more than 10 ppm will be grounds for withdrawal or stoppage of the source emitting exhaust.

Dust: Some dust may be generated from rockfall as a result of scaling activities. For the reconnaissance and sampling phase, this will be controlled by keeping the activity to a minimum. Persons exposed to dust hazards shall carry a respirator, which shall be worn when excessive dust is observed.

2.4 Explosives

Old explosives are frequently encountered in inactive mines. There is a possibility that some residual unexploded explosives could be encountered in the

mine ribs or other areas, as a result of "bootlegs" or other misfires. If explosives are observed, the location will be noted and avoided, and the underground team will withdraw. Any evaluation or handling of old explosives will be only by a Colorado Licensed blaster or a person with Explosive Ordnance Disposal (EOD) training, and then only after a supplemental plan is developed for either countercharging, inerting or removal to another location.

2.5 Chemical Hazards

In accordance with HAZCOM standards, a jobsite Material Safety Data Sheet (MSDS) book, containing MSDSs for any chemicals in use, will be provided onsite by any entity bringing chemicals to the site.

2.6 Inundation / Engulfment

The reconnaissance team will be cognizant of the possibility of impounded water, especially behind roof fall areas. Any potential impoundment will be avoided and cordoned off, pending further evaluation and supplemental planning. Any areas which appear subject to inundation risk will be grounds for team withdrawal or exclusion from entry when recognized. Ponds of standing water may exist: these will be probed for depth before entering.

2.8 Trip / Fall / Snag

The highest probability safety risk is tripping and falling on material underfoot, and snagging on projecting objects. Persons effecting the underground operations are to move slowly and cautiously, to allow time for recognition of these hazards.

2.9 Molds and Slimes

The Red and Bonita mine is damp to wet. Old mines frequently contain significant amounts of molds, fungus, and slimes. If these substances are encountered, handling or contact should be avoided if possible. If not possible to avoid, appropriate respiratory protection, and gloves should be used.

2.10 Animal hazards / Issues

Hantavirus is potentially present at the Red and Bonita mine. Any visible rodent nests or droppings are to be avoided. If that is not possible, they are to be sprayed with a bleach and water solution and a respirator should be worn if it is necessary to disturb or move these materials. No bats have been observed in the Red and Bonita mine workings, and the present closure excludes bats. Large mammals are unlikely. Any evidence of bear or lion scat or bones of prey is grounds for withdrawal, notification of the Division of Wildlife, and supplemental plan development.

2.11 Fire protection

Underground diesel powered equipment and electrical systems pose a fire hazard. It is unlikely that dry combustible material will be present in the Red and Bonita mine. A minimum of one fire extinguisher of a minimum rating of 10A-20BC will be will be available on site.

2.12 Electrical

Electrical installation for this project will be primarily surface facilities. Some underground lighting may be installed. Electrical installation will be inspected by a licensed electrician prior to use of the ventilation fan(s).

2.13 Mobile Equipment

The only mobile equipment used will be surface trucks heavy machinery. Personnel who will use mobile equipment will be trained in its use, and shall be familiar with all systems and controls, and properly licensed. Pre-operational examination of each piece of mobile equipment will be made by its operator prior to use each day. In the event that critical safety deficiencies are noted, they shall be corrected before the machine is used, or the machine shall be tagged out of service.

2.14 Hypothermia

Be aware of the symptoms of hypothermia

- Shivering
- Mental confusion, followed by:
- Violent shivering
- Poor coordination
- Slow awkward movement

All of these are further complicated if there is low oxygen. Any team members who feel like they are cold to the point of discomfort will exit the mine and will not re-enter until re-geared with sufficient clothing and PPE. Any team member exhibiting hypothermia will be assisted from the mine and be given medical treatment.

2) General Measures to Address Risks

3.1 Training

3.1.1 General Training

Persons not having prior MSHA 40-hour underground mine training will be given a hazard briefing, self-rescuer orientation and any relevant task-specific training prior to going underground. Personnel working on this project will also receive

site specific health and safety training on the known and potential hazards present in the project area. Training should include review of this Red and Bonita Mine Entry Safety Plan and information on the previous investigations performed in this area to identify potentially hazardous situations. The training is to be conducted prior to the initial work assignment.

Upon completion of the training, employees must have acquired the understanding, knowledge, and skills necessary for the safe performance of their duties. In addition, training is required when the job duties change, there is a change in the Mine Entry Safety Plan program or a new hazard is identified, or when an employee's job performance shows deficiencies.

3.1.2 Task Training

Personnel will be trained for their specific job duties. Training will be conducted for the Mine Entry Team members, Portal Attendant, and Mine Entry Supervisor. The specific job duties are given below.

3.1.2.1 Mine Entry Team Member Duties

- Know expected hazards, including mode of exposure, signs and symptoms, and consequences of exposure.
- Know the proper use of personal protective equipment (PPE).
- Review available information about the mine and develop a route plan in coordination with Portal Attendant.
- Maintain communication with portal attendant. Let the Portal Attendant know about any changes in the reconnaissance route.
- Exit the mine as soon as possible when ordered by an authorized person, when a prohibited condition is recognized, or when an automatic alarm is activated.
- Alert the attendant when a prohibited condition exists.
- Use monitoring equipment as specified in this plan.
- Know and comply with this Safety Plan.

3.1.2.2 Portal Attendant's Duties

- Remain outside mine portal at all times when persons are underground.
- Know existing and potential hazards including mode of exposure, signs and symptoms, and consequences of exposure.
- Review available information about the mine and be aware of the route plan in coordination with the Mine Entry Team and routine entrants.
- Maintain communication and keep an accurate count of mine entrants. Keep a log of communications with the Mine Entry Team.
- Keep the last reported location of the Mine Entry Team marked on the mine map.

- Know procedures for evacuating the mine when a prohibited condition exists, when a worker shows signs of physiological effects of hazard exposure, when an emergency outside the mine exists, and when the attendant cannot effectively and safely perform required duties.
- Summon emergency rescue services, if required.
- Preventing unauthorized entry into the mine and notifying entry supervisor if unauthorized entry occurs.
- Perform no other duties that interfere with the attendant's primary duties.
- Know and comply with this Safety Plan.

3.1.2.3 Mine Entry Supervisor Duties

- Know existing and potential hazards including mode of exposure, signs and symptoms, and consequences of exposure.
- Verify emergency plans and specified entry conditions such as permits, tests, procedures, and equipment before allowing entry.
- Know and follow Procedures for terminating entry and cancel permits when entry operations are completed or if new hazards are identified.
- Verify the availability of rescue services and means for summoning them are operational.
- Know and follow Procedures for removing unauthorized entrants from mine.
- Ensure that entry operations are consistent with permit and acceptable entry conditions are maintained.
- Assess hazards and revise permit requirements as appropriate.
- Know and comply with this Safety Plan

3.2 Equipment

3.2.1 Personal Protective Equipment

All persons involved in the scope of work covered under this plan area wear a minimum of modified "Level D" personal protective equipment, as follows:

Safety glasses should be worn at all times underground, except when fogging conditions or dripping water effects on the glasses would present a greater hazard due to reduced visibility. Safety glasses will be used at all times during activities which pose a high risk, (i.e.: when driving survey spads or taking rock samples with a geologist's hammer, etc).

Hard Hat: an ANSI-rated hard hat shall be work at all times while underground, and at all times on surface where hazards from falling objects exist.

Boots: Sturdy boots will be a minimum standard for all work.

ANSI-rated hard toe boots are recommended at all times while underground and during surface construction activities.

Clothing: High visibility clothing will be required at all times when persons are working within 50 feet of mobile construction machinery. Additionally, the mine entry team will wear high visibility vests with reflective material on front and rear, or other high-visibility outermost clothing.

To provide skin protection, appropriate protective clothing such as coveralls, gloves, and water proof clothing as needed shall be worn or at hand at all times while underground. Water in the mine may be acidic. Skin and eye contact with the water must be prevented. If contact with water occurs, affected areas must be flushed with clean water and medical attention sought as needed.

Hearing protection must be worn if the noise level appears to approach 85 dBA. As a reference, when conversation becomes difficult at a distance of a few feet, the decibel levels may be greater than 85 dBA.

Dust mask may be required for any scaling or debris removal activities.

3.2.2 Illumination

Primary illumination while underground will be with a miner's lamp. Each team member will be equipped with a lamp, and each team will carry one back-up light, such as a flashlight.

3.2.3 Communication

There will be a Portal Attendant stationed near the entry portal while the team is underground that will make emergency notifications if the team does not emerge from the underground workings at the appointed time. **Under no circumstances will the person serving as portal attendant enter the mine.** The Mine Entry Teams will work out a system of communication with the Portal Attendant. Each underground team and the portal attendant will carry a timepiece.

A site map and driving directions are included in Appendix C.

The coordinates for the site are:

Latitude 37.89722

Longitude -107.64367

All emergency services, including Sheriff, Fire, Ambulance and Mine Rescue, within the area of the Red and Bonita Mine are coordinated through the San Juan County Sheriff's office. Their dispatch phone number is

San Juan County Sheriff **970 387-5531**

911

Cellular phone will be tested for signal. If cellular service is not available onsite, the nearest location where cell service can be obtained will be pre-determined before initiation of underground operations.

Other Notification Phone Numbers in event of emergency:

San Juan Mine Rescue Cooperative

Primary: Jess Fulbright (W) 970-865-2415 x. 24
(C) 970 -428-7001
(H) 970- 864-2116

Alternate: Tom Bird (W) 970-385- 4528
(C) 970 -259-9877
(H) 970- 533-7260

Location of Rescue Station: Ridgeway, CO

Steve Renner (CIMRP) Cell **970-250-5478**

Jeff Graves (CIMRP) Cell **303-618-0850**

In case of serious medical emergency, **Flight for Life** may be required. Their direct phone number is:

Flight for Life: 303.629.3900

If air evacuation is required, the general landing zone requirements are as follows:

- **60 ft x 60 ft. square (100 ft. x 100 ft. at night)**
- **Determine wind speed and direction, communicate to dispatch;**
- **Less than 10 degrees slope;**

- **Area free from obstacles;**
- **Note and communicate location of LZ and any nearby obstacles.**

Helicopter Safety

- Never approach Helicopter with blades turning (unless with pilot approval);
- Approach only from front or side;
- Avoid tail at all times;
- No running, smoking, or operation of helicopter doors or handles.

San Juan County Sheriff's Dispatch can also call Flight for Life, and in all cases should be advised of any emergency. Local EMS may be required to stabilize an injured person before transport to a trauma center by Flight for Life.

3.3 Work Procedures

3.3.1 Reconnaissance Advancement Protocol (not all applicable to routine sampling entries)

The Mine Entry Team will advance into the mine, with the Portal Attendant remaining near the portal area.

A visual inspection of the mine workings ahead of advancement will be conducted to identify safety hazards.

The roof and ribs will be sounded as necessary to evaluate stability. Scaling shall be performed as required.

Any new information obtained during the mine entry will be communicated to the Portal Attendant, who will maintain a logbook of all communications and the location of the Entry Team.

Testing shall be conducted for hazardous atmospheres continuously during advancement and occupancy of the underground workings at the Red and Bonita Mine site. The testing will be done by a qualified person.

The worker shall not be exposed to concentrations of contaminants in excess of those specified in 29 CFR Part 1910 Subpart Z.

If the mine workings are vacated for any significant period of time, the atmosphere shall be re-tested and general safety conditions re-examined. At a minimum, there will be an examination by a qualified experienced miner prior to each day's work underground.

3.3.2 Rescue Capability

The following emergency response measures shall be reviewed by the PIC (or designee) to brief personnel on quickly and safely exiting the area in an emergency.

A list of emergency phone numbers shall be available and maintained by the PIC, who will coordinate emergency transportation and medical care.

In the event that specialized mine rescue capability is required, onsite personnel will work in conjunction with the San Juan Mine rescue team to affect rescue as required.

3.3.3 Portal Attendant

There will be a responsible person at the portal area at all times when persons are underground. The Portal Attendant will be equipped with a means to summon emergency services without leaving their post (eg: cellular or satellite phone).

3.3.4 Tag/in - Tag/out system

A log system will be established and maintained to ensure that there is a positive means to track the number and identity of all persons underground. The Portal Attendant will maintain this record in writing.

3.3.5 Indoctrination

All persons performing work in connection with this work plan will be trained in the provisions of this plan, and shall sign a certification that they have read and understood and will comply with the plan during their work.

The certification page at the back of this copy of the Red and Bonita Mine Entry Plan should be detached and signed. These certifications will be collected and kept on file.

3.3.6 Map Review and Planning

Prior to entering the mine the mine map will be reviewed by all personnel prior to underground entry. A copy of the map will be in the possession of the Portal Attendant. The map will be updated as information is collected through mine reconnaissance.

An initial plan of advancement will be developed and communicated between the Portal Attendant prior to the initial entry. Any changes to the advancement plan will be communicated to the Portal Attendant.

3.3.7 Coordination of Entry Operations with Other Contractors

If any other contractors or employees of another employer are working underground the affected employers must coordinate entry operations to ensure the safety of all affected employees.

3.3.8 Measures to Prevent Unauthorized Entry

3.3.8 1 Barriers & Signage:

The Portal Attendant will watch the road and be alert for any persons attempting to gain access to the mine work area. Entrance to the mine will be denied except as provided under this plan, while persons are underground during the reconnaissance and sampling activity.

3.3.9 Isolation and Lockout/Tagout

All energy sources must be controlled to prevent the unexpected start-up or release of stored energy, which may cause injury to personnel. Energy sources in general include electrical, mechanical, hydraulics, pneumatic, chemical, and thermal. Lock Out and Tag out procedures will be utilized, where applicable.

Energy sources may include: electrical, mechanical, hydraulics, pneumatic, chemical, radioactive and thermal.

3.3.10 Emergency Recognition

Emergency conditions are considered to exist if:

- Any worker is involved in an accident or experiences any adverse health effects or symptoms of exposure while on site.
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

In the event that any site personnel experiences an accident, adverse health effects or symptoms of exposure while on site, the entire crew working in that area will immediately halt work and act according to the instructions provided by the Mine Entry Supervisor.

The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated will result in the evacuation of the work crew and re-evaluation of the hazard and the level of protection by the Mine Entry Supervisor.

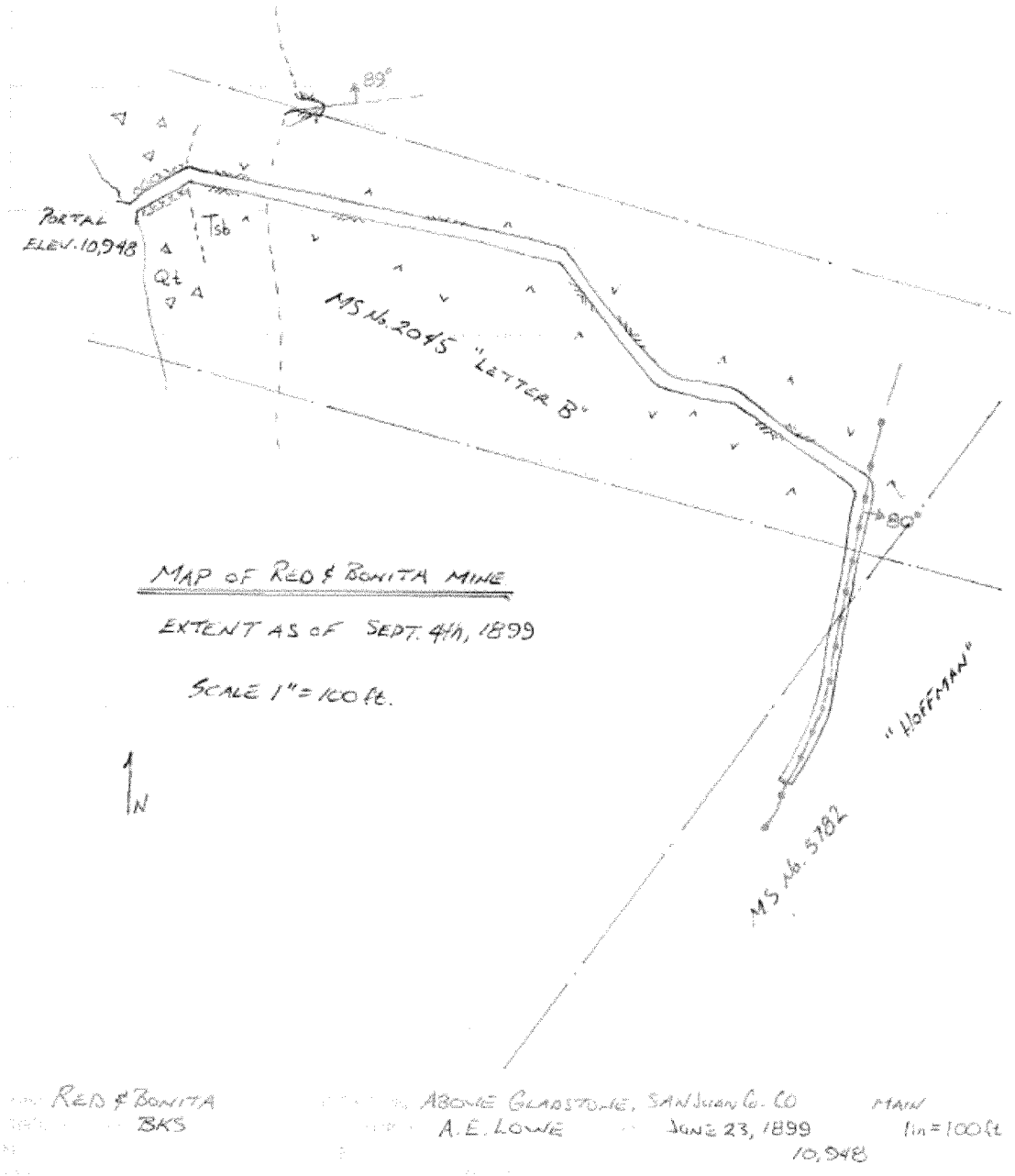
Appendix A

Underground Mine Entry Permit

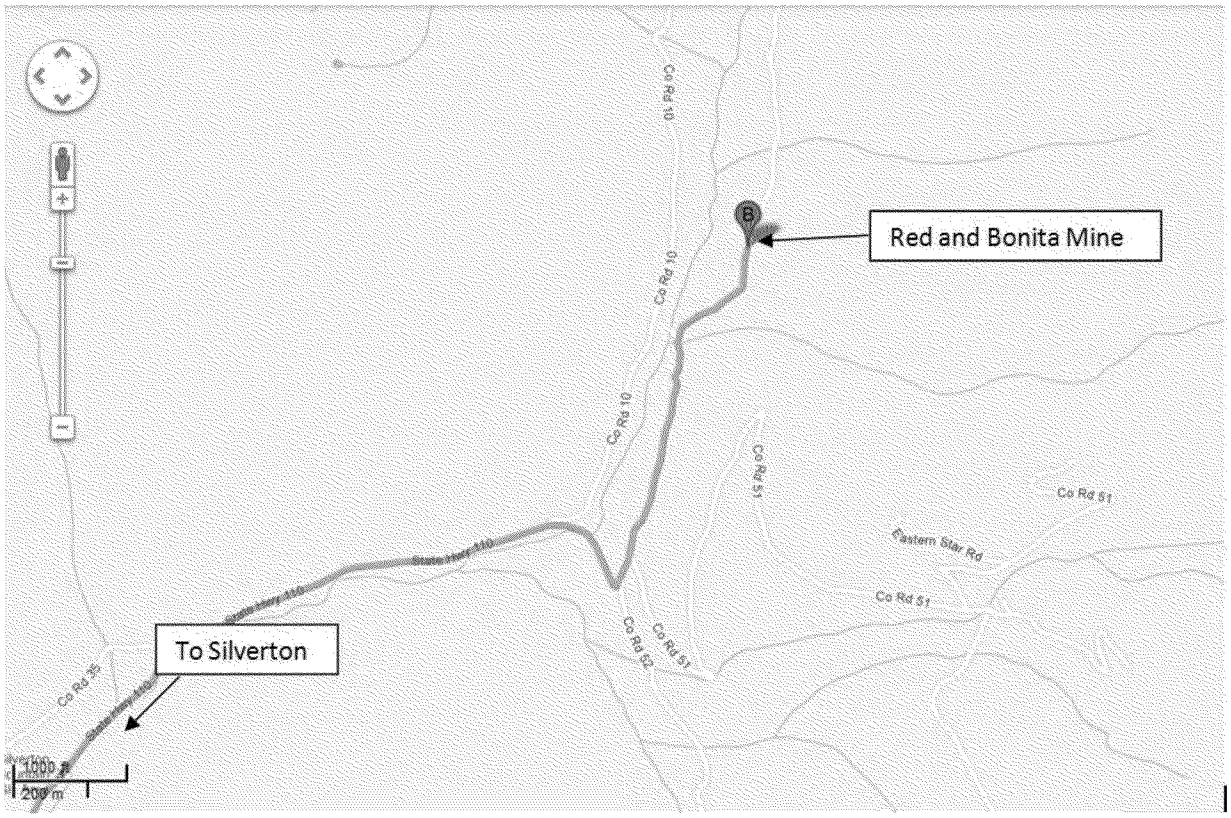
LOCATION AND DESCRIPTION OF UNDERGROUND AREA					DATE
PURPOSE OF ENTRY					TIME __..m.
Entry Supervisor (Name):_____ Signature:_____ Authorized Entrants:_____ Entry Supervisor:_____ Portal Attendant:_____					EXPIRATION __.m.
HAZARDS PRESENT IN THIS CONFINED SPACE					
POTENTIAL HAZARD	YES	POTENTIAL HAZARD	YES	POTENTIAL HAZARD	
		Mobile Equipment (pre-op check)		Toxic Gasses or Vapors (CO, H_2S)	Initial Reading
Oxygen Deficiency (<19.5% or > 23.5%)	Initial Reading			Flammable Gases or Vapors (>10% LEL)	Initial Reading
Unstable rock on roof or ribs		Skin Hazards (sharp rock)		Other:_____ _____	
CONTROL OF HAZARDS, PREPARATION FOR ENTRY	PRESENT (INTITIALIZE FOR YES)	CONTROL	PRESENT (INTITIALIZE FOR YES)	CONTROLS	PRESENT (INTITIALIZE FOR YES)
1: ISOLATION Area Secure from Unauthorized Entry		Communication Equipment from UG to surface			
Space Ventilated or Acceptable Levels		Lighting			
Energy sources Locked Out		Protective Clothing		Lifelines	
Tag-In System		3. RESCUE EQUIPMENT		Other Controls	
		First Aid Kit		Signage	
2. EQUIPMENT: PPE				4. TRAINING: All Personnel Trained, Informed of Hazards	
		Stokes Litter			
Gas Monitor(s)		Communication from surface to rescue services			

The Supervisor, Team members and Portal Attendant shall determine the need for periodic identification and re-evaluation of the hazards based on possible changes in activities in the mine, or other physical and/or environmental conditions, which could adversely affect the personnel underground.

Appendix B - Mine Map – NOTE: Information on the extent of Red and Bonita Workings is Extremely Limited



Appendix C - Site Location Map



Red and Bonita Mine Area

Driving Directions

From the Town of Silverton, take State Highway 110 north approximately 6.4 miles to County Road 52. Take County Road 52 across Cement Creek and proceed north along the creek to the Red and Bonita Mine.

CERTIFICATION

I certify that I have read and understood and will comply with the Red and Bonita Mine Entry Safety Plan during my work on the site.

Any questions I have about how this plan affects the conduct of my duties have been fully explained to me and I understand my responsibilities and the related safety requirements set forth in the Safety Plan.

Signed:_____Date:_____

Printed Name:_____

Company or Organization:_____

APPENDIX C

Work Plan – Mine Adit Entry and Investigation

START 3

Superfund Technical Assessment and Response Team 3 – Region 8

United States
Environmental Protection Agency
Contract No. EP-W-05-050

WORK PLAN
Mine Adit Entry and Investigation

RED and BONITA MINE
Silverton, San Juan County, Colorado

TDD No. 1008-01

May 31, 2012

URS
OPERATING SERVICES, INC.

In association with:
Garry Struthers Associates, Inc.
LT Environmental, Inc.
TechLaw, Inc.
Tetra Tech EMI
TN & Associates, Inc.

WORK PLAN
for
Mine Adit Entry and Investigation

RED AND BONITA MINE
Silverton, San Juan County, Colorado

EPA Contract No. EP-W-05-050
TDD No. 1008-01

Prepared By:
Cordel Schmidt, P.G.
Project Manager

URS Operating Services, Inc.
999 18th Street, Suite 900
Denver, CO 80202-2409

Approved: _____ Date: _____
Steven Way, On-Scene Coordinator, EPA, Region 8

Approved: _____ Date: _____
Charles W. Baker, START 3 Program Manager, UOS

Approved: _____ Date: _____
Cordel Schmidt, Project Manager, START 3, UOS

This document has been prepared for the U.S. Environmental Protection Agency under Contract No. EP-W-05-050. The material contained herein is not to be disclosed to, discussed with, or made available to any person or persons for any reason without prior express approval of a responsible officer of the U.S. Environmental Protection Agency. In the interest of conserving natural resources, this document is printed on recycled paper and double-sided as appropriate.

DISTRIBUTION LIST

U.S. ENVIRONMENTAL PROTECTION AGENCY

Steven Way (2 copies)	On-Scene Coordinator, EPA Region 8

URS OPERATING SERVICES, INC.

Cordel Schmidt	Project Manager, START 3, EPA Region 8
File (2 copies)	START 3, EPA Region 8

Draft WORK PLAN
FOR
MINE ADIT ENTRY and INVESTIGATION

Red and Bonita Mine
Silverton, San Juan County, Colorado

TABLE OF CONTENTS

PAGE #

SIGNATURE PAGE i
DISTRIBUTION LIST ii
TABLE OF CONTENTS iii

1.0 INTRODUCTION 1

2.0 BACKGROUND INFORMATION 1
- 2.1 Site Location and Description
- 2.2 Site Access
- 2.3 Geology

3.0 OBJECTIVES 3
- 3.1 Mine Entry Objectives
- 3.2 Sampling Design and Data Quality Objectives
  - 3.2.1 Identifying the Decision Inputs
  - 3.2.2 Defining the Study Boundaries

4.0 CONCEPT OF OPERATIONS 5
- 4.1 Schedule
- 4.2 Safety
- 4.3 Roles and Responsibilities
- 4.4 Mine Adit Access
- 4.5 Base Flow Water Handling and Sediment Control
- 4.6 Adit Stabilization
- 4.7 Mine Entry and Investigation
- 4.8 Final Site Base Flow Water Handling

5.0 SAMPLING PROCEDURES 9
- 5.1 Sample Locations
- 5.2 Sampling Methods
- 5.3 Field Quality Control Procedures
- 5.4 Laboratory Analytical Parameters
- 5.5 Chain of Custody

TABLE OF CONTENTS, continued

PAGE #

6.0 DATA QUALITY EVALUATION 11
6.1 Data Quality Indicators
6.1.1 Bias
6.1.2 Sensitivity
6.1.3 Precision
6.1.4 Representativeness
6.1.5 Completeness
6.1.6 Comparability

7.0 DELIVERABLES 13

8.0 LIST OF REFERENCES 15

FIGURES

Figure 1 Site Location
Figure 2 1899 Mine Adit Map

TABLES

Table 1 Sample Locations and Rationale
Table 2 Sample Plan Checklist
Table 3 Sample Container Types, Volumes, and Sample Preservation

1.0 INTRODUCTION

URS Operating Services, Inc. (UOS), was tasked by the Environmental Protection Agency (EPA), under Superfund Technical Assessment and Response Team 3 (START) contract # EP-W-05-050, Technical Direction Document (TDD) No. 1008-01, to provide technical support to the Region 8 On-Scene Coordinator (OSC) at an abandoned mine site near Silverton, San Juan County, Colorado. Specifically, START was tasked to provide support at the Red and Bonita mine to allow entry into the adit to perform geologic investigations and sampling. This Work Plan is designed to guide field operations and has been prepared with assistance from Frontier Environmental Services, Inc., who will be assisting in the performance of work tasks. Personnel from the Colorado Division of Reclamation, Mining & Safety (DRMS) will provide technical expertise for mine entries and will perform the mine investigation. A separate Health and Safety Plan was developed by DRMS for the adit entry activity. The investigation activities are estimated to require approximately 3 days.

2.0 BACKGROUND INFORMATION

2.1 SITE LOCATION AND DESCRIPTION

The Red and Bonita Mine site is located along Cement Creek, approximately 10 miles north of the town of Silverton, Colorado, centered near 37.897236° north latitude and -107.64382° west longitude (Figure 1). The Red and Bonita Mine is in the Cement Creek watershed, which is a component of the upper Animas River watershed. These watersheds were the focus of both large- and small-scale mining operations that flourished beginning in 1871 and continued until as late as 1991 (U.S. Geological Survey [USGS] 2007). The Red and Bonita mine site consists of a flowing mine adit, approximately 1.25 acres of waste rock and suspected tailings material, and accompanying debris including the site of a former smelter on the north side of the mine dump. The mine is located on the west-facing slope, east of Cement Creek, approximately 200 vertical feet above the creek. The slope of the mountainside on which the mine is located has an average 44 percent grade (i.e., a 23.75 degree slope because 100 percent grade equals 45 degrees). The talus slope immediately above the mine was measured by START to be 81 percent (39 degrees).

The adit at the Red and Bonita Mine had been collapsed/covered for an unknown number of years and was excavated in 2011 when a new mine portal was installed. The mine is releasing acid mine drainage (AMD) at a rate of approximately 300 gallons per minute (gpm).

The surveyed location of the mine adit is shown on a map produced in 1899 that was obtained from the DRMS (Figure 2). This map shows an adit survey conducted in 1899 and depicts the Red and Bonita adit as a single tunnel with a dogleg to the right. Based on the 1899 map, the first 50 feet inby trends to the east at N61°E, and at 50 feet the adit direction changes to S79°E inby. A structural geologic investigation was performed at the Red and Bonita Mine area by the DRMS in 2007. The investigation included structural and geotechnical observations with regard to emplacement of an interior bulkhead and identification of future study needs (DRMS 2007).

2.2 SITE ACCESS

Road access is via County Road (CR) 110 from the town of Silverton to CR53 located at the abandoned town site of Gladstone. CR53 continues northward up the Cement Creek valley to other mines and also passes the base of the Red and Bonita Mine.

Access to the top of the mine dump is via an earthen road that intersects CR53 approximately 1,000 feet north of the mine site, and which crosses private and Bureau of Land Management (BLM) land. Also, an original road ("south access road") accessing the mid-portion of the mine dump intersects CR53 approximately 250 feet south of the mine. The top surface of the mine dump was capped in 2011 with talus overburden material derived from above the mine dump to allow for equipment access and for excavation activities at the collapsed mine portal, and was required due to a thick sequence of soft yellow boy fines on the dump surface.

2.3 GEOLOGY

The Cement Creek basin is located in the volcanic terrain of the San Juan Mountains. The area was a late Oligocene volcanic center that witnessed the eruption of many cubic miles of lava and volcanic tuffs that covered the area to a depth of more than a mile (USGS 1969). The formation of the 10-mile diameter Silverton caldera produced faults that are generally concentric circular features. The caldera collapse was followed by multiple episodes of hydrothermal activity that produced widespread alteration and mineralization of the rocks (USGS 2007a). Cement Creek flows through the middle of the old Silverton caldera (EPA 1999).

The Red and Bonita mine site is located entirely within Tertiary-aged rocks of the Silverton Volcanic sequence. The Silverton Volcanics are lava flows of intermediate to silicic composition and related volcaniclastic sediments that accumulated to a thickness of approximately 1,000 feet around older volcanoes prior to the subsidence of the Silverton Caldera (USGS 2002). These

volcanic flows have been subdivided into the mappable formations exposed at the Red and Bonita site. The Red and Bonita workings are driven into the Burns Member, a sequence of light to dark grey, thin to thick, intertonguing flows and domes of porphyritic dacite and rhyodacite that outcrops throughout the study area. These rocks have been propylitically altered throughout the watershed. Other geologic units at the site consist of aprons of talus and colluvium (DRMS 2007). A thick sequence of talus/colluvial material, cemented by fluids carrying an iron hydroxysulfate cementing agent, form a "wedge" of ferricrete that has been observed at a shallow depth, less than approximately 2 feet under the mine dump. This ferricrete deposit was also observed at the mine portal extending to an undetermined distance into the mine adit. The location of the crystalline rock contact inside the adit is unknown. The condition of the adit is also unknown.

3.0 OBJECTIVES

3.1 MINE ENTRY OBJECTIVES

Entry into the Red and Bonita Mine adit is being performed to assess the physical condition of the adit and to determine groundwater inflow areas, geologic make-up, and preferential fracturing and jointing within the rock units. Information from the investigation will be used to help make decisions regarding long-term solutions for relieving acid mine drainage flowing from the mine adit into Cement Creek. This investigation of the adit will include a bulkhead feasibility evaluation. Support activities include water management, ventilation, and structural improvements as necessary to allow safe access. Water management will include filtration of mine adit discharge water during work activities and water sample collection. Water sampling will be performed to determine whether the water management measures are effective in controlling disturbances of the precipitate accumulations in the adit that occur during the mine investigation, and to determine the nature of measureable inflows of water within the investigated portion of the adit.

3.2 SAMPLING DESIGN AND DATA QUALITY OBJECTIVES

The Red and Bonita Mine entry Data Quality Objectives (DQOs) were developed by UOS based on information provided by the TDD and the EPA "Guidance for the Data Quality Objectives Process" (EPA 2000). The DQO process applied to the Red and Bonita mine entry sampling are presented here.

Water that discharges from the Red and Bonita Mine contains contaminants that impact water quality in Cement Creek and the Animas River. The Red and Bonita Mine adit is being investigated to characterize conditions within the tunnel and determine potential means to reduce or manage the flow of contaminants from the mine. Evaluation of the temporary change in adit flow water quality, if any, due to the investigation activities and to assess the effectiveness of the controls will also be performed. The information from this investigation will be used along with other information to identify potential means of reducing or eliminating the flow of contaminants from the Red and Bonita Mine.

3.2.1 Identifying the Decision Inputs

Geologic mapping of faults, fracture systems, etc. will be determined from this work and used to evaluate control measures for the adit flow. Inputs to characterizing inflows and identifying potential mine water management strategies to reduce the flow of contaminants from the Red and Bonita Mine are inflow water quality and flow measurements, and the results of the adit investigation.

3.2.2 Defining the Study Boundaries

This investigation is focused on geologic and hydrogeologic conditions and chemistry of the water discharging into and from the Red and Bonita Mine adit.

The decision of whether to pursue various mine water management strategies to reduce the load of contaminants that flow from the Red and Bonita Mine site to Cement Creek and the Animas River will be based on many factors, not just the sample results described in this plan. Sampling of the discharge during the work activities will provide information as to effectiveness of the water management controls during the operations. Decision rules will be established during subsequent investigations.

The investigation of the mine workings and inflows is a screening level study and decisions will be based on additional studies during which support data will be collected to reduce the potential for decision errors that could be realized if decisions were based on a one-time event. Data will be reviewed or validated to ensure that they are acceptable for the intended use.

Because conditions in the mine are unknown, and the details of base flow water handling is dependent on work in the field, sample locations and timing are proposed here, but the actual sample locations and timing will be determined in the field.

4.0 CONCEPT OF OPERATIONS

4.1 SCHEDULE

Entry into the Red and Bonita adit is scheduled for early June 2012. The adit investigation is estimated to be completed in approximately 3 days.

4.2 SAFETY

All field activities will be conducted in strict accordance with a site-wide Site Health and Safety Plan (HASP), which will be developed before the start of field activities by DRMS and communicated to all site personnel. START personnel will also be guided by a UOS site-specific HASP, and Frontier Environmental will develop a HASP to ensure safety of their operations. It is anticipated that all field work can be accomplished in Level D personal protective equipment with the addition of air monitoring capabilities and appropriate mine entry gear.

4.3 ROLES AND RESPONSIBILITIES

This work is being performed by a combination of groups and agencies; therefore, expectations for who is responsible for various aspects of the mine entry, investigation, and testing will be key in ensuring the work is performed efficiently and that the project objectives are met. The following sections describe the anticipated division of work. However, all parties will be working together to accomplish the overall objectives, so it is expected that all participants will provide support for all tasks as needed and able.

The EPA On-Scene Coordinator will:

- Perform overall coordination of site activities;
- Arrange for site access;
- Approve the Work Plan including the Sampling and Analysis Plan (SAP), and the Quality Assurance Project Plan (QAPP);
- Assign sampling and analysis responsibilities;
- Make decisions regarding additional sampling locations/media; and

- Ensure that deliverables are adequate for the intended purpose.

DRMS will:

- Prepare a Mine Entry Safety Plan;
- Perform initial mine reconnaissance and air monitoring;
- Inform EPA contractors of adit ventilation requirements;
- Perform the geologic/hydrogeologic investigation in the Red and Bonita adit;
- Collect water samples from discrete water inflow locations, and provide samples and a description of the sample locations to UOS personnel for processing;
- Measure flow at the water inflow sample locations, where practical and as time permits;
- Document DRMS activities including mine mapping, geologic and hydrogeologic mapping; and
- Prepare a report of DRMS activities and findings.

UOS will:

- Procure a laboratory for sample analysis;
- Contract with Frontier Environmental Services to provide physical site access, repair the Red and Bonita adit, and manage site water;
- Document site activities;
- Note deviations from standard procedures in the logbook or field data collection sheets;
- Collect, document, and ship samples in accordance with the SAP; and
- Provide deliverables to EPA documenting monitoring activities and variations to the standard procedures.

Frontier Environmental Services will:

- Provide personnel, equipment, and materials to provide physical access to the site;
- Repair the Red and Bonita adit for safe entries;
- Install and operate an adit ventilation system; and
- Manage site water.

4.4 MINE ADIT ACCESS

Site access roads will require minor improvement due to winter exposure since the 2011 work season. Improvements will be limited to maintaining previously widened road segments, installing storm water run-on and run-off sediment release control systems, and addition of "turn-out" tees to allow negotiation of the site access road turns by site equipment and vehicles. A site operations pad, an entry operations pad, and a mine water diversion system will be constructed to allow mine rehabilitation and mine water management. A soil stockpile location will be established to manage and isolate soils and rock removed during adit rehabilitation.

4.5 BASE FLOW WATER HANDLING AND SEDIMENT CONTROL

Initial adit entry will include actions to manage base flow from the adit to minimize the disturbance and release of precipitates and sediment. The principal components of the base flow water handling system are:

- A water collection sump placed beyond the current work zone to direct water to the filter bag system;
- 8-inch corrugated piping to isolate flow and convey water from within the adit to a collection point at the mine portal;
- 12-inch chlorinated polyvinyl chloride (CPVC) heavy wall water pipe that conveys mine adit water from near the portal to the water filter bag pad located at the top of the waste rock pile;
- Flocculent addition inline to increase filtration effectiveness;
- Adit water collection and storm water collection sump to be located in front of the portal;
- Erosion control features (sediment control log) installed on the leading edge of the work pad at the adit collection sump and along the outer edge of the work pad;
- Base flow water handling pump and pad to convey adit water collected during adit rehabilitation and work pad storm water;
- Geotube® water filter bag connected to the base flow water handling sump;
- Ditch or piping to convey primary Geotube® bag discharge down the dump face; and
- Secondary Geotube® water filter bag connected to the outlet (west end) of the CR53 culvert below the southwest toe of the waste rock dump.

The Red and Bonita Mine site base flow water handling system has two major operating scenarios, Scenario 1 for non-work hours, and Scenario 2 for site operating hours.

Scenario 1 – Non-Work Hours

During non-operating site hours, the adit discharge and storm water flows will be conveyed directly to the current discharge location at the west edge of the waste rock pile and directed into a pipe or channel where it will flow toward a Geotube® water filter bag attached to the outlet end of the CR53 culvert. The filter bag discharge will gravity flow through the wetlands to Cement Creek. Ultimately, this filtered water will flow through the same area that the adit water currently flows.

Scenario 2 – Hours of Site Operations

The captured adit water flow collected during operating hours will gravity feed-flow through a non-woven geo-textile Geotube® filter bag attached to the outlet of the 12-inch CPVC pipe. This will provide sediment collection from adit flows and run-off storm water collected from the work pad in the adit sump location. To facilitate suspended solid settling/filtering, a flocculent will be injected into the inlet of the 12-inch CPVC pipe to allow for mixing of the flocculent as water flows from the adit entrance to the discharge piping feeding the Geotube® bag.

The currently selected water filter bag dimensions are 15 feet by 15 feet with a nominal sediment collection depth/height of approximately 12 inches.

As water filter bag capacity is consumed, a replacement filter bag will be placed on the consumed filter bag and attached/piped to the base flow water handling piping system. This filter bag replacement action will be repeated until the adit work is completed.

When adit work is completed, the used Geotube® bags will be placed and managed in an on-site location, most likely within the existing waste rock dump. The filter bags will be covered with waste rock or sediment.

4.6 ADIT STABILIZATION

In 2011 the excavation of the portal blockage revealed an intact adit entrance approximately 6 feet wide by 8 feet high. Ferricrete geology was observed at the entrance, and sediment deposits

were observed within the tunnel. The adit back and rib material appeared to be in stable condition. A new portal structure was installed using a 10-foot diameter round culvert inserted into an excavated slot aligned with the original adit. The new portal structure contains a welded steel locking closure to restrict adit access.

The Red and Bonita adit support structures and rock conditions will be evaluated and, as necessary, temporary support structures placed to allow safe access by the adit inspection team. Adit rehabilitation is expected to include installation of steel post sets on 7-foot centers with Douglas fir timber-plank lagging. At the initiation and continuing during the placement of steel-post-sets and timber lagging, an 8-inch flexible corrugated pipe will be laid on the adit floor and a temporary sump will be established to collect water and pipe it past the work zone. The sump and piping installation will continue as steel post sets and timber lagging placement proceeds. The placement of adit base flow water handling pipe will allow for upstream collection and conveyance of adit water beyond the area of tunnel rehabilitation. Likewise, a ventilation system will be established as the work zone extends into the adit.

4.7 MINE ENTRY AND INVESTIGATION

Once adit tunnel safety inspection is complete with stabilization and water management controls installed, the inspection team will continue the entry to assess the physical condition of the adit, identify groundwater inflow areas, characterize the geologic make-up of the adit, and identify preferential fracturing and jointing within the rock units. DRMS will perform measurements needed for preliminary tunnel mapping and photograph features of interest.

4.8 FINAL SITE BASE FLOW WATER HANDLING

At the conclusion of on-site activities, adit flows will be directed into the12-inch CVPC pipe installed at the portal and conveyed to the west-face waste rock dump outfall location. The water filter bags will be removed once adit sediment flows have stabilized following mine entry and support actions. The water filter bags will be staged at the mine waste rock dump for waste management.

5.0 SAMPLING PROCEDURES

Sampling and sample management procedures are described below and reference UOS Technical Standard Operating Procedures (UOS 2005b).

5.1 SAMPLE LOCATIONS

This mine adit entry event involves the collection of mine water and surface water samples (Tables 1 and 2). Sampling points will be determined in the field and may include the Red and Bonita AMD discharge prior to filtration, Geotube® discharge from the bag on top of the mine dump and from the bag at the downstream end of the CR53 culvert, other points of AMD discharge from the site, and mine inflows identified by DRMS. Other non-water samples will be obtained such as mine dump material and precipitate material. Samples numbers will be based on location criteria such as Filter Bag 2, Inflow 125', or already identified locations such as CC03D (CR53 culvert). Sample collection date and time will also be part of the number identification. For example; mine discharge water at the mine portal will be numbered CC03CA0530121002 in which CC03CA = portal location, 053112 = month/day/year, and 1002 = sample time. A sample time is needed to distinguish differing samples from the same location in the same day. Sample locations will be photographed and documented.

5.2 SAMPLING METHODS

UOS will measure field parameters, including pH, temperature and electrical conductivity, of each sample collected as described in TSOP 4.14 "Water Sample Field Measurements" (UOS 2005b). All data will be recorded on appropriate sample forms or in the site logbook.

Water samples will be collected as described in TSOP 4.18, "Surface Water Sampling," into 1-liter poly type bottles for total metals plus mercury analysis (UOS 2005b). The samples will be preserved with nitric acid to a pH less than or equal to 2. Samples will be stored in a cooler with ice to maintain a temperature less than or equal to 4□C. Samples will be shipped to the laboratory via FedEx.

If practical, the flow rate of mine inflows will be estimated using a container of known volume and a stopwatch.

5.3 FIELD QUALITY CONTROL PROCEDURES

All samples will be handled and preserved as described in UOS TSOP 4.2, "Sample Containers, Preservation, and Maximum Holding Times." Calibration of the pH, temperature, and conductivity meters will follow instrument manufacturers' instruction manuals and UOS TSOP 4.14, "Water Sample Field Measurements" (UOS 2005b).

All sampling equipment for these activities is anticipated to be dedicated; i.e., single use. If decontamination is required it will be performed in accordance with UOS TSOP 4.11, "Equipment Decontamination." Basic decontamination will consist of washing or brushing gross particulate off sampling equipment with tap water and a scrub brush, followed by washing equipment with a solution of Liquinox and distilled water, and rinsing with distilled water. After decontamination, the equipment will be allowed to gravity drain (UOS 2005b).

In accordance with the UOS Generic QAPP (UOS 2005a) 1 duplicate water sample and 1 double volume matrix spike/matrix spike duplicate (MS/MSD) sample per set of 20 samples will be obtained to evaluate quality assurance at the site. One duplicate sample and one MS/MSD extra volume sample are anticipated to be required for this site.

5.4 LABORATORY ANALYTICAL PARAMETERS

All samples will be analyzed for total metals plus mercury by the CompuChem Laboratory located in Cary, North Carolina, using EPA methods 6010, 6020, and 7470.

5.5 CHAIN OF CUSTODY

After sample collection and identification, all samples will be handled in strict accordance with the chain-of-custody protocol specified in UOS TSOP 4.3, "Chain of Custody" (UOS 2005b).

6.0 DATA QUALITY EVALUATION

Data quality will be evaluated using the following evaluations, as appropriate.

6.1 DATA QUALITY INDICATORS

Data quality assessment to determine data quality and usability will include:

- A Quality Assurance/Quality Control (QA/QC) review of field generated data and observations;
- Individual data validation reports for all sample delivery groups, if requested by the OSC;
- Review of the procedures used by the validator to qualify data for reasons related to dilution, reanalysis, and duplicate analysis of samples, if applicable;

- Evaluation of QC samples, such as field duplicates/replicates and matrix spike laboratory control samples to assess the quality of the field activities and laboratory procedures;
- Assessment of the quality of data measured and generated in terms of accuracy, precision, and representativeness; and
- Summary of the usability of the data, based upon the assessment of data conducted during the previous steps.

Quality attributes are qualitative and quantitative characteristics of the collected data. The principal quality attributes to environmental studies are precision, bias, representativeness, comparability, completeness, and sensitivity. Data quality indicators (DQIs) are specific indicators of quality attributes.

Performance criteria address the collection of samples, and acceptance criteria address the use of the data collected (EPA 2002). Performance and acceptance criteria will be specified in the project-specific FSP for appropriate data quality indicators. The total allowable errors will be managed to achieve an acceptable level of confidence in the decisions that are made from the data.

6.1.1 Bias

Bias is systematic or persistent distortion of a measurement process that causes errors in one direction. The extent of bias can be determined by an evaluation of laboratory initial calibration/continuing calibration verification, laboratory control spike/laboratory control spike duplicates, blank spike, MS/MSD, and Method Blank.

6.1.2 Sensitivity

Sensitivity generally refers to the capability of a method or instrument to discriminate between small differences in analyte concentration and is generally discussed as detection limits. Before sampling begins it is important to compare detection limits and project requirements in order to select a method with the necessary detection limits to meet the project goals.

6.1.3 Precision

Precision is the measure of agreement among repeated measurements of the same property under identical, or substantially similar, conditions and is expressed as the relative percent difference (RPD) between the sample pairs.

6.1.4 Representativeness

Representativeness is the measure of the degree to which data accurately and precisely represents a characteristic of a population parameter, variations at a sampling point, a process condition, or an environmental condition. Representativeness encompasses both the degree to which measurements reflect the actual concentration, and the degree to which sampling units reflect the population they represent. The effect of representativeness should be considered on two levels: within the sample unit and between sample units. A discussion of representativeness should include adherence to TSOPs for sampling procedures, field and laboratory QA/QC procedures, appropriateness of sample material collected, compositing to increase sample representativeness, homogenization, analytical method and sample preparation, and achievement of Measurement Quality Objectives (MQOs) for the project.

6.1.5 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system. The actual percentage of completeness is less important than the effect of completeness on the data set.

6.1.6 Comparability

Comparability is the qualitative term that expresses the confidence that two data sets can contribute to common interpretation and analysis and is used to describe how well samples within a data set, as well as two independent data sets, are interchangeable

7.0 DELIVERABLES

At the completion of the sampling event, UOS will prepare a report that includes the following information:

- Brief description of site activities and START observations;
- Sample locations including description and a photograph (locations sampled by DRMS will be documented in a DRMS report);
- Exceptions to the SAP and rationale;
- Analytical laboratory(ies);
- Tabularized data including:
    - Field and laboratory analytical data,
    - Flow rates at each mine inflow sample location to the extent the data is available from DRMS, method of flow rate measurement, and indication of confidence in measurement;
- Comparison of results to previous data or data from other locations, as appropriate;
- Estimation of the impacts of discharging mine water during the test relative to the impacts of typical Red and Bonita discharge on water quality in the Animas River (sample location A72); and
- Brief discussion regarding the conditions in the Red and Bonita adit, as available.

DRMS will prepare a report documenting adit conditions.

8.0 LIST OF REFERENCES

Colorado Division of Reclamation, Mining & Safety (DRMS). 2007. "Report of Structural Geologic Investigation – Red and Bonita Mine." August, 2007.

URS Operating Services, Inc. (UOS). 2005a. "Generic Quality Assurance Project Plan" for the Superfund Technical Assessment and Response Team 2, Region 8. June 13, 2005.

URS Operating Services, Inc. (UOS). 2005b. "Technical Standard Operating Procedures for the Superfund Technical Assessment and Response Team (START), EPA Region 8." September 2005.

U.S. Environmental Protection Agency (EPA). 1999. Prioritization of Abandoned Mines in the Animas Watershed, Southwestern Colorado. Carol Cox Russell. http://www.epa.gov/hardrockmining/scitosci/scifiles/422-animas.pdf

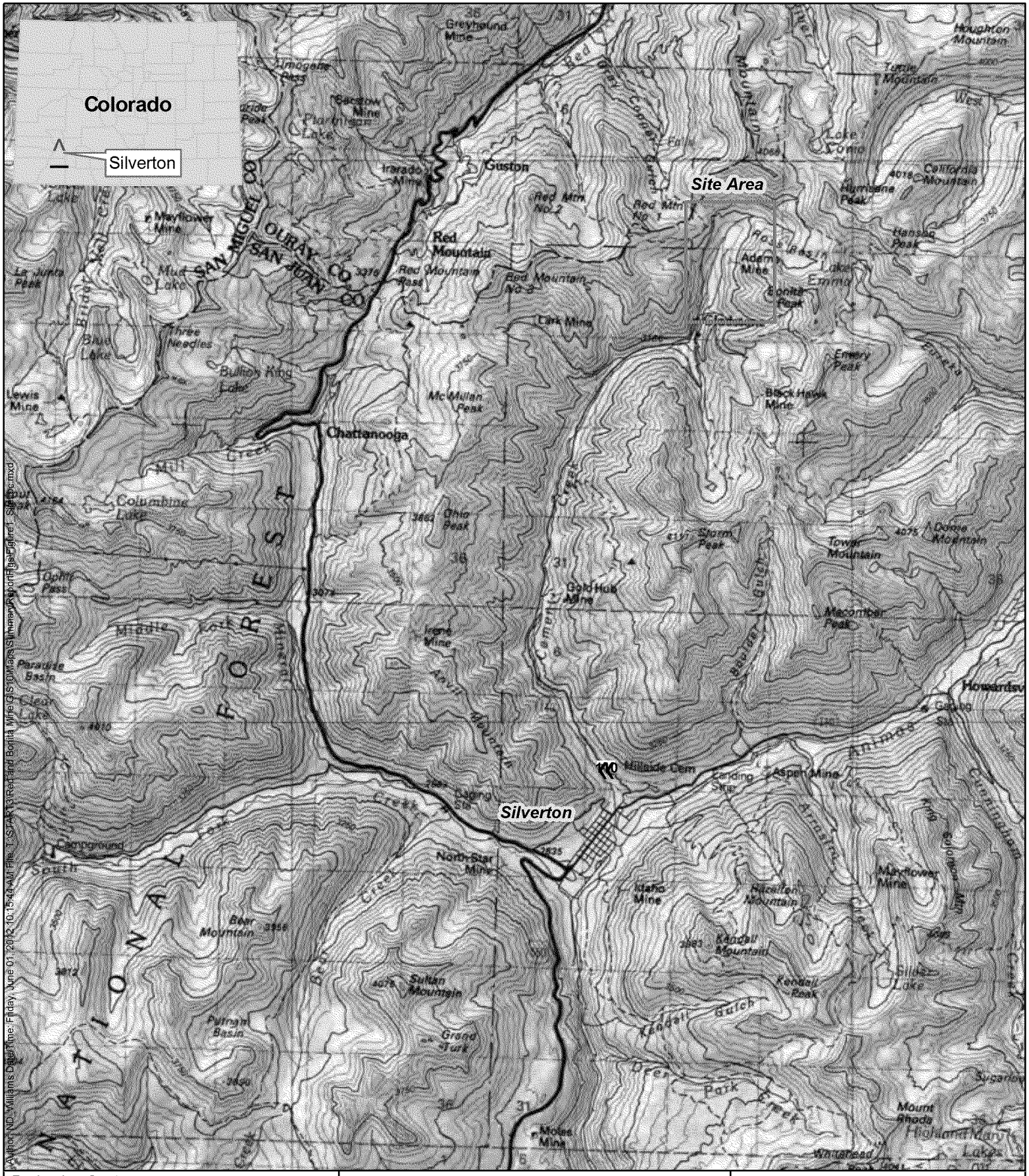
U.S. Environmental Protection Agency (EPA). 2000. "Guidance for the Data Quality Objectives Process." EPA QA/G-4. Copies may be obtained from the Quality Staff Home Page: www.epa.gov/quality August 2000.

U.S. Geological Survey (USGS). 1969. "Geology and Ore Deposits of the Eureka and Adjoining Districts, San Juan Mountains, Colorado. Wilbur S. Burbank and Robert G. Luedke. Geological Survey Professional Paper 535.

U.S. Geological Survey (USGS). 2002. "Generalized Geologic Map of Part of the Upper Animas River Watershed and Vicinity, Silverton, Colorado. Douglas B. Yeager and Dana J. Bove. Miscellaneous Field Studies Map MF-2377.

U.S. Geological Survey (USGS). 2007. Integrated Investigations of Environmental Effects of Historical Mining in the Animas River Watershed, San Juan County, Colorado. Church, S. E., Guerard, P.V., and Finger, S.E. eds. USGS Professional Paper 1651.

U.S. Geological Survey (USGS). 2007a. *Integrated Investigations of Environmental Effects of Historical Mining in the Animas River Watershed. San Juan County, Colorado*. Professional Paper 1651. Volume 1. Chapter E3, "Major Styles of Mineralization and Hydrothermal Alteration and Related Solid- and Aqueous-Phase Geochemical Signatures." By Dana J. Bove, M. Alisa Mast, J. Bradley Dalton, Winfield G. Wright, and Douglas B. Yager.



Projection System:
Universal Transverse
Mercator Zone 13 North
North American Datum 1983

N

Miles
0 0.5 1 2

TDD Title: **Red and Bonita Mine**

Figure: 1

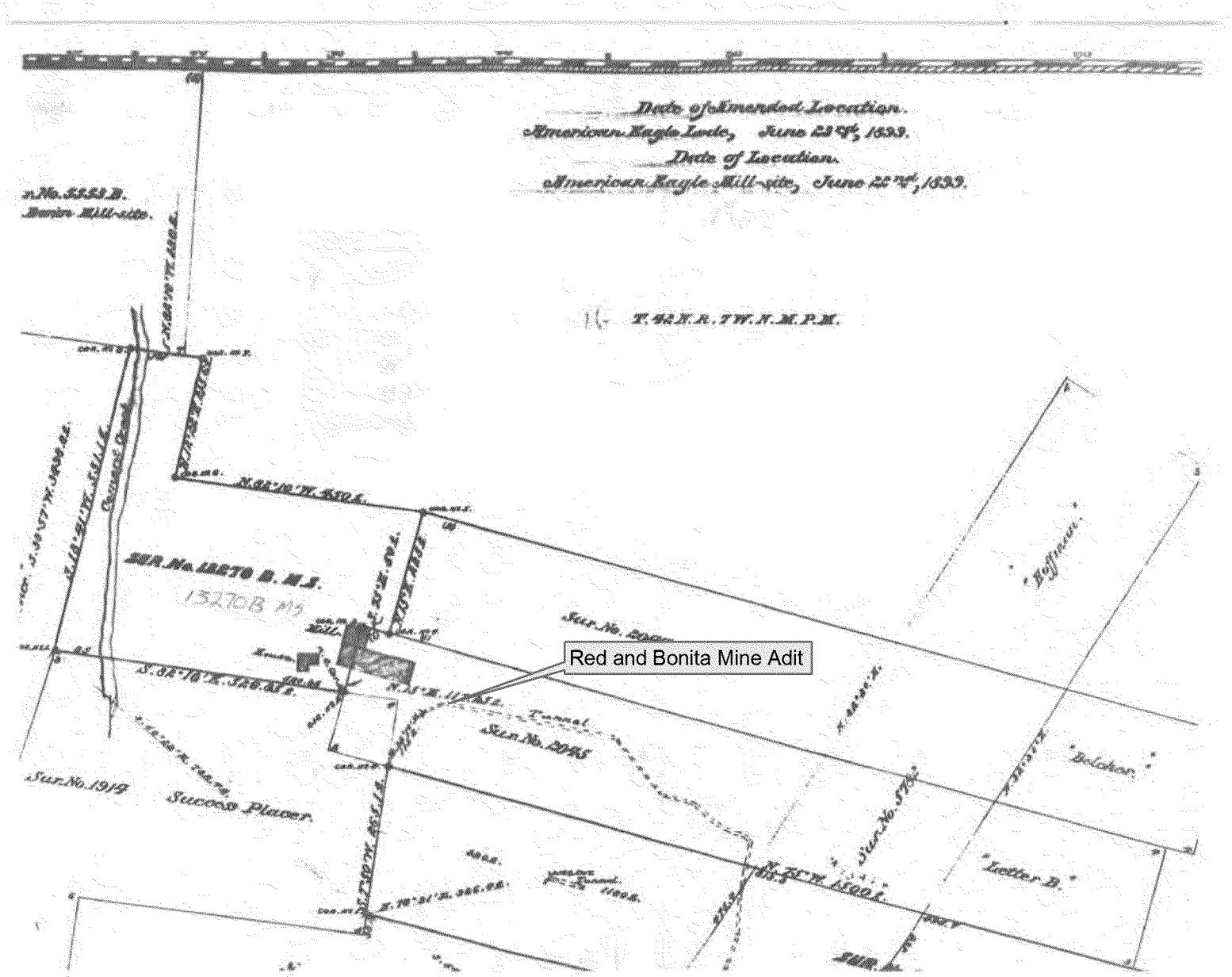
Figure Title: Site Location Map

TDD County: San Juan TDD: 1008-01

TDD State: CO Date: 05/2012

URS OPERATING SERVICES

Sources:
Arcservices World Topmap



NOT TO SCALE

1 inch Page Size: 8.5 x 11

TDD Title:	**Red and Bonita Mine**
Figure:	2
Figure Title:	1899 Survey Map of Red and Bonita
TDD County:	San Juan
TDD State:	CO
TDD:	1008-01
Date:	12/2010

URS OPERATING SERVICES

Sources:

Created: 10/29/2010 Drawn By:joe_gilbert
File Location: T:\START\Red and Bonita Mine\GIS\Marsilfield_activities_report\Figure2_1899_map.mxd

TABLE 1
Sample Locations and Rationale

Matrix	Sample #	Location	Rationale
Mine discharge water	TBD	To be collected from the prior to mine entry.	To monitor effectiveness of filtration performed on site and metals content within site waters.
Mine discharge water	TBD	To be collected from the top of the mine dump after filtration.	
Mine discharge water	TBD	To be collected from the toe of the mine dump after filtration.	
Mine adit water	TBD	To be collected from the interior of the mine adit from mine inflow locations.	To determine the quality of mine inflow waters.
Mine dump material	TBD	Mine dump.	Determine metals content in dump material.
Mine discharge precipitate	TBD	Mine adit and/or from flow path on dump face.	Determine metals content.
QA/QC	TBD	To be determined in field. At least one duplicate sample and at least one double volume MS/MSD sample will be collected.	Quality assurance/quality control.

TABLE 2
Sample Plan Checklist

Sample Location	Sample Type	Field Parameters			Laboratory Analysis	Quality Control Samples		
		Temp	pH	Cond	Total Metals plus Mercury	Dup	Spike	Blank
All aqueous	Mine discharge water	X	X	X	X			
One location to be determined	QA/QC	X	X	X	X	X		
One location to be determined	QA/QC	X	X	X	X		X	

TABLE 3
Sample Container Types, Volumes, and Sample Preservation

Sample Matrix	Analysis	Analysis Mode	Required Detection Limits	Units	Container Number and Type[2]	Required Volume	Preservation	Analysis Time
Mine Discharge Water	Total Metals plus Mercury	NA	EPA Methods 6010, 6020, 7470	NA	1 1-liter Poly bottle	1 liter	Nitric acid to pH ≤ 2	4-6 weeks
Mine dump and precipitate material	Total Metals plus Mercury	NA	EPA Methods 6010, 6020, 7470	NA	glass jar	8 ounce	Wet ice	6 months

APPENDIX D

Filtrate Disposal

James

WCA New Mexico Colorado

UC 0894

NON-HAZARDOUS MANIFEST

GENERATOR

Generator U.S. EPA
Address 1595 Wynkoop St.
Denver, CO 80202
Phone 303-312-6723

EPA
I.D. #
Shipping Location Red + Bonita Mine Site
Address CR 10 + CR53, Silverton CO
Phone 303

Description of Waste Materials	Industrial Waste Code #	Profile Number	Total Quantity	Unit of Measure	Container Type
Mine Drainage Precipitate		B000205	20	yd	Roll-off
					3042

I hereby certify that the above-described materials are not hazardous wastes as defined by 40 CFR, Part 261 or any applicable state law or regulation, have been fully and accurately described, classified and packaged, and are in proper condition for transportation according to applicable law and regulations. Frontier Environmental

(X) Daniel S Hinds
Generator Authorized Agent Name (Print)

(X) [signature]
Signature

(X) 7/13/2012
Delivery Date

TRANSPORTER

Transporter Name WCA
Address PO Box 215
Bloomfield, NM 87413

I hereby acknowledge receipt of the above-described materials for transport from the generator shipping location listed above.

[signature] 7.13.12
Driver Signature Shipment Date

Driver Name (Print) X James Barthel
Truck Number X 605
Truck Type X Roll off

I hereby acknowledge that the above-described materials were received from generator shipping location and were transported without incident to the destination listed below.

[signature] 7.13.12
Driver Signature Delivery Date

DESTINATION

Mailing Address
Site Name Bondad Landfill
Address P.O. Box 215
Bloomfield, NM 87413

I hereby acknowledge receipt of the above-described materials.

Paula Hicks Gate Attn
Name of Authorized Agent (Print)

Physical Address
Site Name Bondad Landfill
Address CR 318 • Bondad, CO 81301
Phone Number 1-970-247-8295

RCI - 110579W

[signature] 7/13/12
Signature Receipt Date

White – Original Canary – Disposer Retain Pink – Transporter Retain Goldenrod – Generator Retain

Requested Disposal Facility: Bondad Landfill, Durango, CO

Waste Profile #
WCA Sales Rep:Susan Wright
Date: _____

I. Generator Information

Generator Name : U.S. EPA			
Generator Site Address: Remote location, Gladstone, CO			
City: Gladstone	County: San Juan	State: Colorado	Zip: 81433
Generator Mailing Address(If Different): 1595 Wynkoop St.			
City: Denver	County: Denver	State: Colorado	Zip: 80202
Generator Contact Name (print): Steve Way			
Phone Number: 303-312-6723		Fax Number:	

IIa. Transporter Information

Transporter Name: WCA		Transporter Contact Name: Susan	
Transporter Address: **1500 County Road 310**			
City: **Durango**	County: La Plata	State: CO	Zip: 81303
Phone Number: 800-230-6072		Fax Number:	

IIb. Billing Information

Bill To: **Frontier Environmental Services, c/o Dan Hinds**			
Billing Address: **5350 Vivian Street; Unit B**			
City: Arvada	County: Jefferson	State: CO	Zip: 80002-1958

III. Waste Stream Information

Name of Waste: Mine drainage precipitate.

Process Generating Waste:

Type of Waste: _____ Industrial Process Waste X Pollution Control Waste

Physical State: ____Solid X Semi-Solid ___ Powder ___ Liquid ___ Other : _____

Method of Shipment: _____ Bulk _____ Bagged X (fabric filter bags) Other: _____

Estimated Annual Volume: 20 Cubic Yards _____ Tons _____ Gallons _____ Other:

Frequency: X One Time _____ Daily ____ Weekly ____ Monthly ____ Other

Special Handling Instructions:

IV. Representative Sample Certification

Is the representative sample collected to prepare this profile and laboratory analysis, collected in accordance with U.S. EPA 40 CFR 261.20(c) guidelines or equivalent rules? X Yes _____ No

Sample Date: 06/14/12	Type of Sample: ____ Composite Sample X Grab Sample	
Laboratory: CompuChem, Cary, NC	Sample ID Numbers:	PPT04 061412 1121
Sampler's Employer: URS Operating Services, Inc.		
Sampler's Name (printed): Cordel Schmidt	Signature: Cordel Schmidt	

Waste Profile #

V. Physical Characteristics of Waste

Characteristic Components	% by weight (range)
1. Solid – 30.2%	
2. Clay-like	
3.	
4.	
5.	

Color	Odor (describe)	Free Liquids	% Solids	pH:	Flash Point:	Phenol
Red	None	___Yes X No Content _____ %	30.2	4.21	_____n/a__ °F	___n/a___ ppm

Attach Laboratory Analytical Report (and/or Material Safety Data Sheet) Including Required Parameters provided for this Profile

Does this waste or generating process contain regulated concentrations of the following Pesticides and/or Herbicides: Chlordane, Endrin, Heptachlor (and it epoxides), Lindane, Methoxychlor, Toxaphene, 2,4-D, or 2, 4,5-TP Silvex as defined in 40 CFR 261.33?	___ Yes or __X_ No
Does this waste or generating process cause it to exceed OSHA exposure limits from high levels of Hydrogen Sulfide or Hydrogen Cyanide as defined in 40 CFR 261.23?	___ Yes or _X__ No
Does this waste contain regulated concentrations of Polychlorinated Biphenyls (PCB's) as defined in 40 CFR Part 761?	___ Yes or __X_ No
Does this waste contain regulated concentrations of listed hazardous wastes defined in 40 CFR 261.31, 261.32, 261.33, including RCRA F-Listed Solvents?	___ Yes or _X__ No
Does this waste contain regulated concentrations of 2,3,4,8-Tetrachlorodibenzodioxin (2,3,7,8-TCCD), or any other dioxin as defined in 40 CR 261.31?	___ Yes or __X_ No
Is this a regulated Toxic Material as defined by Federal and/or State regulations?	___ Yes or __X_ No
Is this a regulated Radioactive Waste as defined by Federal and/or State regulations?	___ Yes or _X__ No
Is this a regulated Medical or Infectious Waste as defined by Federal and/or State regulations?	___ Yes or _X__ No
Is this waste generated at a Federal Superfund Clean Up Site?	___ Yes or __X_ No

VI. Generator Certification

I hereby certify that to the best of my knowledge and belief, the information contained herein is a true, complete and accurate description of the waste material being offered for disposal and all known or suspected hazards have been disclosed. All Analytical Results/Material Safety Data Sheets submitted are truthful and complete and are representative of the waste. I further certify that by utilizing this profile, neither myself nor any other employee of the company will deliver for disposal or attempt to deliver for disposal any waste which is classified as toxic waste, hazardous waste or infectious waste, or any other waste material this facility is prohibited from accepting by law. I shall immediately give written notice of any change or condition pertaining to the waste not provided herein. Our company hereby agrees to full indemnify this disposal facility/recycling facility against any damages resulting from this certification being inaccurate or untrue. I further certify that the company has not altered the form or content of this profile sheet as provided by A Clean Environment. The undersigned individual warrants that he/she is authorized to sign this document on behalf of the Generator.

Steve Way, On-Scene Coordinator
Authorized Representative Name And Title (Printed)

US EPA
Company Name

Authorized Representative Signature

7/6/12
Date

VII. Decision

___ Approved ____ Rejected Expiration:_____

Conditions:

Name, Title Signature Date

ANALYSIS DATA SHEET

PPT04-061412-1121

Client: URS OPERATING SERVICES SDG: 1206068 Project: 36548983/PR10141/OS-12-P-10141-WASTE-TCLP

Lab ID: 1206068-01 % Solid: Matrix: Soil Sampled: 06/14/12 Received: 06/21/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7440-38-2	Arsenic	4.04	3.92	2500	1	J	EPA 6010C	2F26011	6/26/12 10:26
7440-39-3	Barium		66.5	50000	1	U	EPA 6010C	2F26011	6/26/12 10:26
7440-43-9	Cadmium	31.1	1.77	500	1	J	EPA 6010C	2F26011	6/26/12 10:26
7440-47-3	Chromium		3.76	2500	1	U	EPA 6010C	2F26011	6/26/12 10:26
7439-92-1	Lead	118	3.58	2500	1	J	EPA 6010C	2F26011	6/26/12 10:26
7439-97-6	Mercury	0.0830	0.0355	200	1	J	EPA 7470A	2F26012	6/25/12 10:15
7782-49-2	Selenium	10.3	3.54	500	1	J	EPA 6010C	2F26011	6/26/12 10:26
7440-22-4	Silver		2.02	500	1	U	EPA 6010C	2F26011	6/26/12 10:26

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

PPT04 061412 1121

Client: URS OPERATING SERVICES SDG: 1206084 Project: 36548983/PR10141/OS-12-P-10141-WASTE-TCLP

Lab ID: 1206084-01 % Solid: 30.2 Matrix: Soil Sampled: 06/14/12 Received: 06/26/12

CAS NO.	Analyte	Conc. (pH Units)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
PH	pH	4.21			1		EPA 9045C/9045D	2F27012	6/26/12 14:45

CAS NO.	Analyte	Conc. (mg/kg dry)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
RCYAN	Reactive Cyanide	4.13	3.31	414	1		9014	2F28002	6/26/12 16:30
RSULF	Reactive Sulfide	33.2	3.31	414	1	J	EPA 9034	2F28001	6/26/12 17:00
RSULF	Reactive Sulfide	33.2	3.31	414	1	J	EPA 9034	2F28003	6/28/12 8:15

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

PPT04-061412-1121

Client: URS OPERATING SERVICES SDG: 1206058 Project: 36548983/PR10141/OS-12-P-10141-14 DAY WASTE

Lab ID: 1206058-01 % Solid: 30.2 Matrix: Soil Sampled: 06/14/12 Received: 06/16/12

CAS NO.	Analyte	Conc. (mg/kg dry)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	2360	6.59	61.9	1		EPA 6010C	2F22004	6/22/12 10:39
7440-36-0	Antimony		1.38	9.28	1	U	EPA 6010C	2F22004	6/22/12 10:39
7440-38-2	Arsenic	67.0	0.510	3.09	1		EPA 6010C	2F22004	6/22/12 10:39
7440-39-3	Barium	5.66	3.68	61.9	1	J	EPA 6010C	2F22004	6/22/12 10:39
7440-41-7	Beryllium	3.93	0.0872	1.55	1		EPA 6010C	2F22004	6/22/12 10:39
7440-43-9	Cadmium	5.83	0.199	1.55	1		EPA 6010C	2F22004	6/22/12 10:39
7440-70-2	Calcium	1750	92.5	1550	1		EPA 6010C	2F22004	6/22/12 10:39
7440-47-3	Chromium	1.37	0.368	3.09	1	J	EPA 6010C	2F22004	6/22/12 10:39
7440-48-4	Cobalt		0.915	6.19	1	U	EPA 6010C	2F22004	6/22/12 10:39
7440-50-8	Copper	128	0.356	1.55	1		EPA 6010C	2F22004	6/22/12 10:39
7439-89-6	Iron	509000	27.5	309	5	D	EPA 6010C	2F22004	6/22/12 14:23
7439-92-1	Lead	1210	0.563	3.09	1		EPA 6010C	2F22004	6/22/12 10:39
7439-95-4	Magnesium	140	81.3	1550	1	J	EPA 6010C	2F22004	6/22/12 10:39
7439-96-5	Manganese	174	0.156	3.09	1		EPA 6010C	2F22004	6/22/12 10:39
7439-97-6	Mercury	0.145	0.0214	0.101	1		EPA 7471B	2F25008	6/22/12 14:59
7440-02-0	Nickel	0.608	0.290	3.09	1	J	EPA 6010C	2F22004	6/22/12 10:39
7440-09-7	Potassium	76.8	10.5	1550	1	J	EPA 6010C	2F22004	6/22/12 10:39
7782-49-2	Selenium		0.634	3.09	1	U	EPA 6010C	2F22004	6/22/12 10:39
7440-22-4	Silver	2.86	0.167	1.55	1		EPA 6010C	2F22004	6/22/12 10:39
7440-23-5	Sodium	195	165	1550	1	J	EPA 6010C	2F22004	6/22/12 10:39
7440-28-0	Thallium	38.9	1.99	9.28	1		EPA 6010C	2F22004	6/22/12 10:39
7440-62-2	Vanadium	21.7	0.439	6.19	1		EPA 6010C	2F22004	6/22/12 10:39
7440-66-6	Zinc	399	0.826	9.28	1		EPA 6010C	2F22004	6/22/12 10:39

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

APPENDIX E

Laboratory Analytical Results

Total Metals Data

ANALYSIS DATA SHEET

CC03CA-05302012-1002

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY T

Lab ID: 1206008-01 % Solid: Matrix: Water Sampled: 05/30/12 Received: 06/05/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	4290	78.2	200	1		EPA 6010C	2F19018	6/19/12 20:5
7440-36-0	Antimony		0.130	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 15:0
7440-38-2	Arsenic	2.86	0.700	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:0
7440-39-3	Barium	13.9	0.500	50.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:0
7440-41-7	Beryllium	6.91	0.165	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:0
7440-43-9	Cadmium	32.7	0.0550	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:08
7440-70-2	Calcium	448000	3450	10000	2	D	EPA 6010C	2F26011	6/26/12 11:55
7440-47-3	Chromium		0.340	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 15:08
7440-48-4	Cobalt	98.2	0.0475	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:08
7440-50-8	Copper	8.49	0.600	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:08
7439-89-6	Iron	89500	69.4	200	1		EPA 6010C	2F19018	6/19/12 20:56
7439-92-1	Lead	77.7	0.105	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:08
7439-95-4	Magnesium	25400	1640	5000	1		EPA 6010C	2F19018	6/19/12 20:56
7439-96-5	Manganese	35100	6.72	20.0	2	D	EPA 6010C	2F26011	6/26/12 11:55
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 8:44
7440-02-0	Nickel	67.7	0.0455	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:08
7440-09-7	Potassium	1830	1470	5000	1	J	EPA 6010C	2F19018	6/19/12 20:56
7782-49-2	Selenium	3.14	0.450	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:08
7440-22-4	Silver		0.0400	5.00	5	U, D	EPA 6020A	2F26008	6/25/12 15:08
7440-23-5	Sodium	8110	1840	5000	1		EPA 6010C	2F19018	6/19/12 20:56
7440-28-0	Thallium	0.179	0.0750	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:08
7440-62-2	Vanadium	0.306	0.280	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:08
7440-66-6	Zinc	14000	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 20:56

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

CC03CA-05302012-1704

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY T

Lab ID: 1206008-02 % Solid: Matrix: Water Sampled: 05/30/12 Received: 06/05/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	4280	78.2	200	1		EPA 6010C	2F19018	6/19/12 21:0
7440-36-0	Antimony		0.130	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 15:0
7440-38-2	Arsenic	2.78	0.700	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:0
7440-39-3	Barium	13.2	0.500	50.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:09
7440-41-7	Beryllium	7.48	0.165	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:09
7440-43-9	Cadmium	33.3	0.0550	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:09
7440-70-2	Calcium	445000	3450	10000	2	D	EPA 6010C	2F26011	6/26/12 12:02
7440-47-3	Chromium		0.340	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 15:09
7440-48-4	Cobalt	93.9	0.0475	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:09
7440-50-8	Copper	7.07	0.600	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:09
7439-89-6	Iron	89000	69.4	200	1		EPA 6010C	2F19018	6/19/12 21:03
7439-92-1	Lead	77.9	0.105	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:09
7439-95-4	Magnesium	25400	1640	5000	1		EPA 6010C	2F19018	6/19/12 21:03
7439-96-5	Manganese	34700	6.72	20.0	2	D	EPA 6010C	2F26011	6/26/12 12:02
7439-97-6	Mercury	0.0440	0.0355	0.200	1	J	EPA 7470A	2F25012	6/25/12 8:46
7440-02-0	Nickel	64.6	0.0455	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:09
7440-09-7	Potassium	1800	1470	5000	1	J	EPA 6010C	2F19018	6/19/12 21:03
7782-49-2	Selenium	2.66	0.450	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:09
7440-22-4	Silver	0.0406	0.0400	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:09
7440-23-5	Sodium	8030	1840	5000	1		EPA 6010C	2F19018	6/19/12 21:03
7440-28-0	Thallium	0.147	0.0750	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:09
7440-62-2	Vanadium		0.280	25.0	5	U, D	EPA 6020A	2F26008	6/25/12 15:09
7440-66-6	Zinc	14000	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 21:03

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

CC03D-05302012-1030

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY TA

Lab ID: 1206008-03 % Solid: Matrix: Water Sampled: 05/30/12 Received: 06/05/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	4930	78.2	200	1		EPA 6010C	2F19018	6/19/12 21:10
7440-36-0	Antimony		0.130	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 15:11
7440-38-2	Arsenic	3.27	0.700	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:11
7440-39-3	Barium	14.1	0.500	50.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:11
7440-41-7	Beryllium	7.26	0.165	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:11
7440-43-9	Cadmium	32.4	0.0550	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:11
7440-70-2	Calcium	451000	3450	10000	2	D	EPA 6010C	2F26011	6/26/12 12:10
7440-47-3	Chromium		0.340	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 15:11
7440-48-4	Cobalt	98.4	0.0475	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:11
7440-50-8	Copper	8.81	0.600	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:11
7439-89-6	Iron	92900	69.4	200	1		EPA 6010C	2F19018	6/19/12 21:10
7439-92-1	Lead	109	0.105	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:11
7439-95-4	Magnesium	25800	1640	5000	1		EPA 6010C	2F19018	6/19/12 21:10
7439-96-5	Manganese	35300	6.72	20.0	2	D	EPA 6010C	2F26011	6/26/12 12:10
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 8:47
7440-02-0	Nickel	66.1	0.0455	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:11
7440-09-7	Potassium	1840	1470	5000	1	J	EPA 6010C	2F19018	6/19/12 21:10
7782-49-2	Selenium	3.27	0.450	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:11
7440-22-4	Silver	0.0506	0.0400	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:11
7440-23-5	Sodium	8170	1840	5000	1		EPA 6010C	2F19018	6/19/12 21:10
7440-28-0	Thallium	0.158	0.0750	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:11
7440-62-2	Vanadium	0.506	0.280	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:11
7440-66-6	Zinc	14200	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 21:10

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

CC03D-05302012-1641

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY T

Lab ID: 1206008-04 % Solid: Matrix: Water Sampled: 05/30/12 Received: 06/05/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	4470	78.2	200	1		EPA 6010C	2F19018	6/19/12 21:1
7440-36-0	Antimony	0.302	0.130	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:1
7440-38-2	Arsenic	3.63	0.700	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:1
7440-39-3	Barium	15.3	0.500	50.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:1
7440-41-7	Beryllium	7.20	0.165	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:1
7440-43-9	Cadmium	34.2	0.0550	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:1
7440-70-2	Calcium	444000	3450	10000	2	D	EPA 6010C	2F26011	6/26/12 12:1
7440-47-3	Chromium		0.340	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 15:17
7440-48-4	Cobalt	95.8	0.0475	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:17
7440-50-8	Copper	9.53	0.600	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:17
7439-89-6	Iron	89800	69.4	200	1		EPA 6010C	2F19018	6/19/12 21:17
7439-92-1	Lead	93.9	0.105	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:17
7439-95-4	Magnesium	25900	1640	5000	1		EPA 6010C	2F19018	6/19/12 21:17
7439-96-5	Manganese	34900	6.72	20.0	2	D	EPA 6010C	2F26011	6/26/12 12:17
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 8:50
7440-02-0	Nickel	65.7	0.0455	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:17
7440-09-7	Potassium	1830	1470	5000	1	J	EPA 6010C	2F19018	6/19/12 21:17
7782-49-2	Selenium	3.31	0.450	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:17
7440-22-4	Silver	0.337	0.0400	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:17
7440-23-5	Sodium	8100	1840	5000	1		EPA 6010C	2F19018	6/19/12 21:17
7440-28-0	Thallium	0.383	0.0750	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:17
7440-62-2	Vanadium	0.562	0.280	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:17
7440-66-6	Zinc	14200	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 21:17

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

A72-06062012-1745

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY TAT

Lab ID: 1206008-05 % Solid: Matrix: Water Sampled: 06/06/12 Received: 06/12/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	647	78.2	200	1		EPA 6010C	2F19018	6/19/12 21:25
7440-36-0	Antimony	0.100	0.0260	2.00	1	J	EPA 6020A	2F26008	6/25/12 13:09
7440-38-2	Arsenic	0.655	0.140	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:09
7440-39-3	Barium	19.0	0.100	10.0	1		EPA 6020A	2F26008	6/25/12 13:09
7440-41-7	Beryllium	0.116	0.0330	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:09
7440-43-9	Cadmium	0.779	0.0110	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:09
7440-70-2	Calcium	28300	1720	5000	1		EPA 6010C	2F19018	6/19/12 21:25
7440-47-3	Chromium	0.128	0.0680	2.00	1	J	EPA 6020A	2F26008	6/25/12 13:09
7440-48-4	Cobalt	1.55	0.00950	1.00	1		EPA 6020A	2F26008	6/25/12 13:09
7440-50-8	Copper	9.56	0.120	2.00	1		EPA 6020A	2F26008	6/25/12 13:09
7439-89-6	Iron	914	69.4	200	1		EPA 6010C	2F19018	6/19/12 21:25
7439-92-1	Lead	3.55	0.0210	1.00	1		EPA 6020A	2F26008	6/25/12 13:09
7439-95-4	Magnesium	2160	1640	5000	1	J	EPA 6010C	2F19018	6/19/12 21:25
7439-96-5	Manganese	422	3.36	10.0	1		EPA 6010C	2F19018	6/19/12 21:25
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 8:55
7440-02-0	Nickel	1.94	0.00910	1.00	1		EPA 6020A	2F26008	6/25/12 13:09
7440-09-7	Potassium		1470	5000	1	U	EPA 6010C	2F19018	6/19/12 21:25
7782-49-2	Selenium	0.312	0.0900	5.00	1	J	EPA 6020A	2F26008	6/25/12 13:09
7440-22-4	Silver	0.0277	0.00800	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:09
7440-23-5	Sodium		1840	5000	1	U	EPA 6010C	2F19018	6/19/12 21:25
7440-28-0	Thallium	0.0369	0.0150	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:09
7440-62-2	Vanadium	0.219	0.0560	5.00	1	J	EPA 6020A	2F26008	6/25/12 13:09
7440-66-6	Zinc	186	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 21:25

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

A72-06062012-1825

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY TAT

Lab ID: 1206008-06 % Solid: Matrix: Water Sampled: 06/06/12 Received: 06/12/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	700	78.2	200	1		EPA 6010C	2F19018	6/19/12 21:54
7440-36-0	Antimony	0.102	0.0260	2.00	1	J	EPA 6020A	2F26008	6/25/12 13:10
7440-38-2	Arsenic	0.652	0.140	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:10
7440-39-3	Barium	20.1	0.100	10.0	1		EPA 6020A	2F26008	6/25/12 13:10
7440-41-7	Beryllium	0.138	0.0330	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:10
7440-43-9	Cadmium	0.768	0.0110	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:10
7440-70-2	Calcium	28600	1720	5000	1		EPA 6010C	2F19018	6/19/12 21:54
7440-47-3	Chromium	0.131	0.0680	2.00	1	J	EPA 6020A	2F26008	6/25/12 13:10
7440-48-4	Cobalt	1.54	0.00950	1.00	1		EPA 6020A	2F26008	6/25/12 13:10
7440-50-8	Copper	9.96	0.120	2.00	1		EPA 6020A	2F26008	6/25/12 13:10
7439-89-6	Iron	950	69.4	200	1		EPA 6010C	2F19018	6/19/12 21:54
7439-92-1	Lead	4.15	0.0210	1.00	1		EPA 6020A	2F26008	6/25/12 13:10
7439-95-4	Magnesium	2200	1640	5000	1	J	EPA 6010C	2F19018	6/19/12 21:54
7439-96-5	Manganese	422	3.36	10.0	1		EPA 6010C	2F19018	6/19/12 21:54
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 8:57
7440-02-0	Nickel	1.82	0.00910	1.00	1		EPA 6020A	2F26008	6/25/12 13:10
7440-09-7	Potassium		1470	5000	1	U	EPA 6010C	2F19018	6/19/12 21:54
7782-49-2	Selenium	0.270	0.0900	5.00	1	J	EPA 6020A	2F26008	6/25/12 13:10
7440-22-4	Silver	0.0218	0.00800	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:10
7440-23-5	Sodium		1840	5000	1	U	EPA 6010C	2F19018	6/19/12 21:54
7440-28-0	Thallium	0.0215	0.0150	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:10
7440-62-2	Vanadium	0.235	0.0560	5.00	1	J	EPA 6020A	2F26008	6/25/12 13:10
7440-66-6	Zinc	186	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 21:54

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

A72-06062012-1845

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY TAT

Lab ID: 1206008-07 % Solid: Matrix: Water Sampled: 06/06/12 Received: 06/12/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	672	78.2	200	1		EPA 6010C	2F19018	6/19/12 22:01
7440-36-0	Antimony	0.0907	0.0260	2.00	1	J	EPA 6020A	2F26008	6/25/12 13:12
7440-38-2	Arsenic	0.686	0.140	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:12
7440-39-3	Barium	19.1	0.100	10.0	1		EPA 6020A	2F26008	6/25/12 13:12
7440-41-7	Beryllium	0.113	0.0330	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:12
7440-43-9	Cadmium	0.770	0.0110	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:12
7440-70-2	Calcium	27800	1720	5000	1		EPA 6010C	2F19018	6/19/12 22:01
7440-47-3	Chromium	0.176	0.0680	2.00	1	J	EPA 6020A	2F26008	6/25/12 13:12
7440-48-4	Cobalt	1.50	0.00950	1.00	1		EPA 6020A	2F26008	6/25/12 13:12
7440-50-8	Copper	9.99	0.120	2.00	1		EPA 6020A	2F26008	6/25/12 13:12
7439-89-6	Iron	935	69.4	200	1		EPA 6010C	2F19018	6/19/12 22:01
7439-92-1	Lead	4.89	0.0210	1.00	1		EPA 6020A	2F26008	6/25/12 13:12
7439-95-4	Magnesium	2130	1640	5000	1	J	EPA 6010C	2F19018	6/19/12 22:01
7439-96-5	Manganese	406	3.36	10.0	1		EPA 6010C	2F19018	6/19/12 22:01
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 8:59
7440-02-0	Nickel	1.78	0.00910	1.00	1		EPA 6020A	2F26008	6/25/12 13:12
7440-09-7	Potassium		1470	5000	1	U	EPA 6010C	2F19018	6/19/12 22:01
7782-49-2	Selenium	0.230	0.0900	5.00	1	J	EPA 6020A	2F26008	6/25/12 13:12
7440-22-4	Silver	0.0203	0.00800	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:12
7440-23-5	Sodium		1840	5000	1	U	EPA 6010C	2F19018	6/19/12 22:01
7440-28-0	Thallium	0.0219	0.0150	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:12
7440-62-2	Vanadium	0.250	0.0560	5.00	1	J	EPA 6020A	2F26008	6/25/12 13:12
7440-66-6	Zinc	181	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 22:01

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

ADIT275-06062012-1430

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY TAT

Lab ID: 1206008-08 % Solid: Matrix: Water Sampled: 06/06/12 Received: 06/12/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	11500	78.2	200	1		EPA 6010C	2F19018	6/19/12 22:08
7440-36-0	Antimony		0.130	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 15:19
7440-38-2	Arsenic	3.69	0.700	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:19
7440-39-3	Barium	4.81	0.500	50.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:19
7440-41-7	Beryllium	4.46	0.165	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:19
7440-43-9	Cadmium	95.8	0.0550	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:19
7440-70-2	Calcium	492000	3450	10000	2	D	EPA 6010C	2F26011	6/26/12 12:24
7440-47-3	Chromium		0.340	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 15:19
7440-48-4	Cobalt	106	0.0475	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:19
7440-50-8	Copper	17.5	0.600	10.0	5	D	EPA 6020A	2F26008	6/25/12 15:19
7439-89-6	Iron	94600	69.4	200	1		EPA 6010C	2F19018	6/19/12 22:08
7439-92-1	Lead	152	0.105	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:19
7439-95-4	Magnesium	31300	1640	5000	1		EPA 6010C	2F19018	6/19/12 22:08
7439-96-5	Manganese	27500	6.72	20.0	2	D	EPA 6010C	2F26011	6/26/12 12:24
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 9:00
7440-02-0	Nickel	72.6	0.0455	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:19
7440-09-7	Potassium	2070	1470	5000	1	J	EPA 6010C	2F19018	6/19/12 22:08
7782-49-2	Selenium	3.97	0.450	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:19
7440-22-4	Silver	0.118	0.0400	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:19
7440-23-5	Sodium	8770	1840	5000	1		EPA 6010C	2F19018	6/19/12 22:08
7440-28-0	Thallium	0.222	0.0750	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:19
7440-62-2	Vanadium	3.08	0.280	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:19
7440-66-6	Zinc	15600	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 22:08

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

CC03CA-06052012-1355

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY TAT

Lab ID: 1206008-09 % Solid: Matrix: Water Sampled: 06/05/12 Received: 06/12/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	17100	78.2	200	1		EPA 6010C	2F19018	6/19/12 22:15
7440-36-0	Antimony	2.08	0.130	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:21
7440-38-2	Arsenic	50.5	0.700	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:21
7440-39-3	Barium	16.1	0.500	50.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:21
7440-41-7	Beryllium	15.9	0.165	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:21
7440-43-9	Cadmium	54.9	0.0550	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:21
7440-70-2	Calcium	445000	3450	10000	2	D	EPA 6010C	2F26011	6/26/12 12:46
7440-47-3	Chromium	1.23	0.340	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:21
7440-48-4	Cobalt	89.1	0.0475	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:21
7440-50-8	Copper	214	0.600	10.0	5	D	EPA 6020A	2F26008	6/25/12 15:21
7439-89-6	Iron	470000	69.4	200	1		EPA 6010C	2F19018	6/19/12 22:15
7439-92-1	Lead	1410	0.105	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:21
7439-95-4	Magnesium	25900	1640	5000	1		EPA 6010C	2F19018	6/19/12 22:15
7439-96-5	Manganese	35000	6.72	20.0	2	D	EPA 6010C	2F26011	6/26/12 12:46
7439-97-6	Mercury	0.368	0.0355	0.200	1		EPA 7470A	2F25012	6/25/12 9:02
7440-02-0	Nickel	60.7	0.0455	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:21
7440-09-7	Potassium	1950	1470	5000	1	J	EPA 6010C	2F19018	6/19/12 22:15
7782-49-2	Selenium	5.01	0.450	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:21
7440-22-4	Silver	5.97	0.0400	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:21
7440-23-5	Sodium	8250	1840	5000	1		EPA 6010C	2F19018	6/19/12 22:15
7440-28-0	Thallium	0.189	0.0750	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:21
7440-62-2	Vanadium	49.5	0.280	25.0	5	D	EPA 6020A	2F26008	6/25/12 15:21
7440-66-6	Zinc	15800	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 22:15

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

CC03D-06052012-1740

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY T

Lab ID: 1206008-10 % Solid: Matrix: Water Sampled: 06/05/12 Received: 06/12/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	21700	78.2	200	1		EPA 6010C	2F19018	6/19/12 22:2
7440-36-0	Antimony	3.15	0.130	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:2
7440-38-2	Arsenic	91.2	0.700	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:2
7440-39-3	Barium	31.2	0.500	50.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:2
7440-41-7	Beryllium	20.8	0.165	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:2
7440-43-9	Cadmium	82.8	0.0550	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:2
7440-70-2	Calcium	432000	3450	10000	2	D	EPA 6010C	2F26011	6/26/12 12:5
7440-47-3	Chromium	2.77	0.340	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:22
7440-48-4	Cobalt	87.4	0.0475	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:22
7440-50-8	Copper	348	0.600	10.0	5	D	EPA 6020A	2F26008	6/25/12 15:22
7439-89-6	Iron	691000	69.4	200	1		EPA 6010C	2F19018	6/19/12 22:22
7439-92-1	Lead	2330	0.105	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:22
7439-95-4	Magnesium	25100	1640	5000	1		EPA 6010C	2F19018	6/19/12 22:22
7439-96-5	Manganese	33800	6.72	20.0	2	D	EPA 6010C	2F26011	6/26/12 12:53
7439-97-6	Mercury	0.667	0.0355	0.200	1		EPA 7470A	2F25012	6/25/12 9:04
7440-02-0	Nickel	59.3	0.0455	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:22
7440-09-7	Potassium	2250	1470	5000	1	J	EPA 6010C	2F19018	6/19/12 22:22
7782-49-2	Selenium	5.90	0.450	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:22
7440-22-4	Silver	9.89	0.0400	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:22
7440-23-5	Sodium	8000	1840	5000	1		EPA 6010C	2F19018	6/19/12 22:22
7440-28-0	Thallium	0.203	0.0750	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:22
7440-62-2	Vanadium	70.0	0.280	25.0	5	D	EPA 6020A	2F26008	6/25/12 15:22
7440-66-6	Zinc	15400	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 22:22

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

CC03D-06062012-1023

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY TAT

Lab ID: 1206008-11 % Solid: Matrix: Water Sampled: 06/06/12 Received: 06/12/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	9560	78.2	200	1		EPA 6010C	2F19018	6/19/12 22:30
7440-36-0	Antimony	0.599	0.130	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:24
7440-38-2	Arsenic	14.1	0.700	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:24
7440-39-3	Barium	26.4	0.500	50.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:24
7440-41-7	Beryllium	8.42	0.165	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:24
7440-43-9	Cadmium	59.3	0.0550	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:24
7440-70-2	Calcium	447000	3450	10000	2	D	EPA 6010C	2F26011	6/26/12 13:00
7440-47-3	Chromium	0.915	0.340	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:24
7440-48-4	Cobalt	97.7	0.0475	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:24
7440-50-8	Copper	140	0.600	10.0	5	D	EPA 6020A	2F26008	6/25/12 15:24
7439-89-6	Iron	132000	69.4	200	1		EPA 6010C	2F19018	6/19/12 22:30
7439-92-1	Lead	361	0.105	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:24
7439-95-4	Magnesium	26100	1640	5000	1		EPA 6010C	2F19018	6/19/12 22:30
7439-96-5	Manganese	35300	6.72	20.0	2	D	EPA 6010C	2F26011	6/26/12 13:00
7439-97-6	Mercury	0.0430	0.0355	0.200	1	J	EPA 7470A	2F25012	6/25/12 9:06
7440-02-0	Nickel	65.8	0.0455	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:24
7440-09-7	Potassium	2100	1470	5000	1	J	EPA 6010C	2F19018	6/19/12 22:30
7782-49-2	Selenium	3.93	0.450	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:24
7440-22-4	Silver	1.75	0.0400	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:24
7440-23-5	Sodium	8240	1840	5000	1		EPA 6010C	2F19018	6/19/12 22:30
7440-28-0	Thallium	0.169	0.0750	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:24
7440-62-2	Vanadium	9.69	0.280	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:24
7440-66-6	Zinc	14800	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 22:30

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

CCFB-06062012-1043

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY T

Lab ID: 1206008-12 % Solid: Matrix: Water Sampled: 06/06/12 Received: 06/12/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	4670	78.2	200	1		EPA 6010C	2F19018	6/19/12 22:3
7440-36-0	Antimony		0.130	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 15:2
7440-38-2	Arsenic	1.78	0.700	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:2
7440-39-3	Barium	12.5	0.500	50.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:2
7440-41-7	Beryllium	4.49	0.165	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:2
7440-43-9	Cadmium	39.3	0.0550	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:2
7440-70-2	Calcium	455000	3450	10000	2	D	EPA 6010C	2F26011	6/26/12 13:0
7440-47-3	Chromium	0.518	0.340	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:2
7440-48-4	Cobalt	97.7	0.0475	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:25
7440-50-8	Copper	8.46	0.600	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:25
7439-89-6	Iron	88300	69.4	200	1		EPA 6010C	2F19018	6/19/12 22:37
7439-92-1	Lead	39.1	0.105	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:25
7439-95-4	Magnesium	25500	1640	5000	1		EPA 6010C	2F19018	6/19/12 22:37
7439-96-5	Manganese	35500	6.72	20.0	2	D	EPA 6010C	2F26011	6/26/12 13:07
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 9:07
7440-02-0	Nickel	65.4	0.0455	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:25
7440-09-7	Potassium	1840	1470	5000	1	J	EPA 6010C	2F19018	6/19/12 22:37
7782-49-2	Selenium	2.82	0.450	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:25
7440-22-4	Silver	0.0713	0.0400	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:25
7440-23-5	Sodium	8030	1840	5000	1		EPA 6010C	2F19018	6/19/12 22:37
7440-28-0	Thallium	0.140	0.0750	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:25
7440-62-2	Vanadium	0.478	0.280	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:25
7440-66-6	Zinc	13700	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 22:37

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

CCGS-06062012-1004

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY TA

Lab ID: 1206008-13 % Solid: Matrix: Water Sampled: 06/06/12 Received: 06/12/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	2160	78.2	200	1		EPA 6010C	2F19018	6/19/12 22:44
7440-36-0	Antimony	0.104	0.0260	2.00	1	J	EPA 6020A	2F26008	6/25/12 13:14
7440-38-2	Arsenic	0.939	0.140	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:14
7440-39-3	Barium	17.4	0.100	10.0	1		EPA 6020A	2F26008	6/25/12 13:14
7440-41-7	Beryllium	0.734	0.0330	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:14
7440-43-9	Cadmium	9.31	0.0110	1.00	1		EPA 6020A	2F26008	6/25/12 13:14
7440-70-2	Calcium	58600	1720	5000	1		EPA 6010C	2F19018	6/19/12 22:44
7440-47-3	Chromium	0.337	0.0680	2.00	1	J	EPA 6020A	2F26008	6/25/12 13:14
7440-48-4	Cobalt	9.14	0.00950	1.00	1		EPA 6020A	2F26008	6/25/12 13:14
7440-50-8	Copper	157	0.120	2.00	1		EPA 6020A	2F26008	6/25/12 13:14
7439-89-6	Iron	6220	69.4	200	1		EPA 6010C	2F19018	6/19/12 22:44
7439-92-1	Lead	26.4	0.0210	1.00	1		EPA 6020A	2F26008	6/25/12 13:14
7439-95-4	Magnesium	4840	1640	5000	1	J	EPA 6010C	2F19018	6/19/12 22:44
7439-96-5	Manganese	3290	3.36	10.0	1		EPA 6010C	2F19018	6/19/12 22:44
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 9:09
7440-02-0	Nickel	8.08	0.00910	1.00	1		EPA 6020A	2F26008	6/25/12 13:14
7440-09-7	Potassium		1470	5000	1	U	EPA 6010C	2F19018	6/19/12 22:44
7782-49-2	Selenium	0.784	0.0900	5.00	1	J	EPA 6020A	2F26008	6/25/12 13:14
7440-22-4	Silver	0.175	0.00800	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:14
7440-23-5	Sodium		1840	5000	1	U	EPA 6010C	2F19018	6/19/12 22:44
7440-28-0	Thallium	0.0296	0.0150	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:14
7440-62-2	Vanadium	0.410	0.0560	5.00	1	J	EPA 6020A	2F26008	6/25/12 13:14
7440-66-6	Zinc	2070	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 22:44

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

CCGS-06062012-1255

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY TAT

Lab ID: 1206008-14 % Solid: Matrix: Water Sampled: 06/06/12 Received: 06/12/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	2440	78.2	200	1		EPA 6010C	2F19018	6/19/12 22:51
7440-36-0	Antimony	0.120	0.0260	2.00	1	J	EPA 6020A	2F26008	6/25/12 13:15
7440-38-2	Arsenic	1.27	0.140	1.00	1		EPA 6020A	2F26008	6/25/12 13:15
7440-39-3	Barium	18.3	0.100	10.0	1		EPA 6020A	2F26008	6/25/12 13:15
7440-41-7	Beryllium	0.954	0.0330	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:15
7440-43-9	Cadmium	9.84	0.0110	1.00	1		EPA 6020A	2F26008	6/25/12 13:15
7440-70-2	Calcium	70800	1720	5000	1		EPA 6010C	2F19018	6/19/12 22:51
7440-47-3	Chromium	0.720	0.0680	2.00	1	J	EPA 6020A	2F26008	6/25/12 13:15
7440-48-4	Cobalt	11.4	0.00950	1.00	1		EPA 6020A	2F26008	6/25/12 13:15
7440-50-8	Copper	155	0.120	2.00	1		EPA 6020A	2F26008	6/25/12 13:15
7439-89-6	Iron	11200	69.4	200	1		EPA 6010C	2F19018	6/19/12 22:51
7439-92-1	Lead	35.4	0.0210	1.00	1		EPA 6020A	2F26008	6/25/12 13:15
7439-95-4	Magnesium	5570	1640	5000	1		EPA 6010C	2F19018	6/19/12 22:51
7439-96-5	Manganese	4200	3.36	10.0	1		EPA 6010C	2F19018	6/19/12 22:51
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 9:11
7440-02-0	Nickel	9.49	0.00910	1.00	1		EPA 6020A	2F26008	6/25/12 13:15
7440-09-7	Potassium		1470	5000	1	U	EPA 6010C	2F19018	6/19/12 22:51
7782-49-2	Selenium	0.752	0.0900	5.00	1	J	EPA 6020A	2F26008	6/25/12 13:15
7440-22-4	Silver	0.233	0.00800	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:15
7440-23-5	Sodium	2100	1840	5000	1	J	EPA 6010C	2F19018	6/19/12 22:51
7440-28-0	Thallium	0.0372	0.0150	1.00	1	J	EPA 6020A	2F26008	6/25/12 13:15
7440-62-2	Vanadium	0.664	0.0560	5.00	1	J	EPA 6020A	2F26008	6/25/12 13:15
7440-66-6	Zinc	2460	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 22:51

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

CC03CA-061412-1206t

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY TAT

Lab ID: 1206008-15 % Solid: Matrix: Water Sampled: 06/14/12 Received: 06/16/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	4300	78.2	200	1		EPA 6010C	2F19018	6/19/12 22:59
7440-36-0	Antimony		0.130	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 15:27
7440-38-2	Arsenic	3.29	0.700	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:27
7440-39-3	Barium	13.0	0.500	50.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:27
7440-41-7	Beryllium	6.78	0.165	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:27
7440-43-9	Cadmium	33.1	0.0550	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:27
7440-70-2	Calcium	438000	3450	10000	2	D	EPA 6010C	2F26011	6/26/12 13:15
7440-47-3	Chromium	0.381	0.340	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:27
7440-48-4	Cobalt	96.9	0.0475	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:27
7440-50-8	Copper	8.36	0.600	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:27
7439-89-6	Iron	91400	69.4	200	1		EPA 6010C	2F19018	6/19/12 22:59
7439-92-1	Lead	82.7	0.105	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:27
7439-95-4	Magnesium	25300	1640	5000	1		EPA 6010C	2F19018	6/19/12 22:59
7439-96-5	Manganese	34300	6.72	20.0	2	D	EPA 6010C	2F26011	6/26/12 13:15
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 9:17
7440-02-0	Nickel	70.2	0.0455	5.00	5	D	EPA 6020A	2F26008	6/25/12 15:27
7440-09-7	Potassium	1820	1470	5000	1	J	EPA 6010C	2F19018	6/19/12 22:59
7782-49-2	Selenium	3.12	0.450	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:27
7440-22-4	Silver		0.0400	5.00	5	U, D	EPA 6020A	2F26008	6/25/12 15:27
7440-23-5	Sodium	8240	1840	5000	1		EPA 6010C	2F19018	6/19/12 22:59
7440-28-0	Thallium	0.150	0.0750	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 15:27
7440-62-2	Vanadium	0.285	0.280	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 15:27
7440-66-6	Zinc	13900	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 22:59

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

CC03D-061412-1220t

Client: URS OPERATING SERVICES SDG: 1206008 Project: 36548983/PR10141/OS-12-P-10141-WATER-14 DAY TAT

Lab ID: 1206008-16 % Solid: Matrix: Water Sampled: 06/14/12 Received: 06/16/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum	4030	78.2	200	1		EPA 6010C	2F19018	6/19/12 19:58
7440-36-0	Antimony		0.130	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 14:58
7440-38-2	Arsenic	4.13	0.700	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 14:58
7440-39-3	Barium	13.6	0.500	50.0	5	J, D	EPA 6020A	2F26008	6/25/12 14:58
7440-41-7	Beryllium	6.92	0.165	5.00	5	D	EPA 6020A	2F26008	6/25/12 14:58
7440-43-9	Cadmium	33.1	0.0550	5.00	5	D	EPA 6020A	2F26008	6/25/12 14:58
7440-70-2	Calcium	443000	3450	10000	2	D	EPA 6010C	2F26011	6/26/12 11:19
7440-47-3	Chromium	0.392	0.340	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 14:58
7440-48-4	Cobalt	94.4	0.0475	5.00	5	D	EPA 6020A	2F26008	6/25/12 14:58
7440-50-8	Copper	11.4	0.600	10.0	5	D	EPA 6020A	2F26008	6/25/12 14:58
7439-89-6	Iron	85100	69.4	200	1		EPA 6010C	2F19018	6/19/12 19:58
7439-92-1	Lead	103	0.105	5.00	5	D	EPA 6020A	2F26008	6/25/12 14:58
7439-95-4	Magnesium	23700	1640	5000	1		EPA 6010C	2F19018	6/19/12 19:58
7439-96-5	Manganese	34500	6.72	20.0	2	D	EPA 6010C	2F26011	6/26/12 11:19
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 8:37
7440-02-0	Nickel	63.5	0.0455	5.00	5	D	EPA 6020A	2F26008	6/25/12 14:58
7440-09-7	Potassium	1750	1470	5000	1	J	EPA 6010C	2F19018	6/19/12 19:58
7782-49-2	Selenium	2.84	0.450	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 14:58
7440-22-4	Silver	0.0444	0.0400	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 14:58
7440-23-5	Sodium	7650	1840	5000	1		EPA 6010C	2F19018	6/19/12 19:58
7440-28-0	Thallium	0.159	0.0750	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 14:58
7440-62-2	Vanadium	0.483	0.280	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 14:58
7440-66-6	Zinc	13100	10.2	30.0	1		EPA 6010C	2F19018	6/19/12 19:58

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp

INORGANIC DATA REPORTING QUALIFIERS

On the Form I, under the column labeled "Q" for qualifier, each result is flagged with the specific data reporting qualifiers listed below, as appropriate. The qualifiers used are:

U : This flag indicates the compound was analyzed for, not detected and is reported as less than the Method Detection Limit (MDL) (or as defined by the client). The Reporting Limit (RL), or Limit of Quantitation (LOQ), and the MDL will be adjusted to reflect any dilution or concentration of the sample and, for soils, the percent moisture.

J : This flag indicates the reported result is an estimated value. The flag is used when an analyte is detected and the result is less than the adjusted RL/LOQ but equal to or greater than the MDL.

Q : This flag denotes that one or more quality control criteria have failed (e.g., LCS recovery, Continuing Calibration Verification, CCV, and interference check standards for ICP-AES/ICP-MS) and reanalyses can't be performed. The Q flag is applied to all specific analyte(s) in all samples associated with the failed quality control criteria.

B : This flag is used when the analyte is found in the associated method or calibration blank as well as in the sample. It indicates probable blank contamination and warns the data user to take appropriate action. The combination of flags BU or UB is not an allowable policy. Blank contaminants are flagged B only when they are detected in the sample.

D: This flag is applied to an analyte when the reported result is based on a dilution.

X/Y/Z : Other specific flags may be required to properly define the results. If used, the flags will be fully described in the SDG Narrative. The laboratory-defined flags are limited to X, Y, and Z.

The extensions: D, S, SD, L, and A are added to the end of the Client ID and represent the following:

D – Matrix Duplicate
S – Matrix Spike
SD – Matrix Spike Duplicate
L – Serial Dilution
A – Post Digestion Spike

Revision 0 (11-09-2010)

Location	Matrix	Analysis	Analyte	Result	Units	Lab Qualifi	Date_Collected
A72	Surface Wa	ICPMS Tot.	Antimony		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Tot.	Arsenic		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Tot.	Barium		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Tot.	Cadmium	0.957	ug/L	JD	5/15/2012
A72	Surface Wa	ICPMS Tot.	Chromium		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Tot.	Cobalt	1.57	ug/L	D	5/15/2012
A72	Surface Wa	ICPMS Tot.	Copper	12.2	ug/L	D	5/15/2012
A72	Surface Wa	ICPMS Tot.	Lead	4.27	ug/L	D	5/15/2012
A72	Surface Wa	ICPMS Tot.	Nickel		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Tot.	Selenium		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Tot.	Silver		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Tot.	Thallium	4.68	ug/L	JD	5/15/2012
A72	Surface Wa	ICPMS Tot.	Vanadium		ug/L	U	5/15/2012
A72	Surface Wa	ICPOE Tot.	Aluminum	701	ug/L		5/15/2012
A72	Surface Wa	ICPOE Tot.	Beryllium		ug/L	U	5/15/2012
A72	Surface Wa	ICPOE Tot.	Calcium	30600	ug/L		5/15/2012
A72	Surface Wa	ICPOE Tot.	Iron	1280	ug/L		5/15/2012
A72	Surface Wa	ICPOE Tot.	Magnesium	2350	ug/L		5/15/2012
A72	Surface Wa	ICPOE Tot.	Manganese	485	ug/L		5/15/2012
A72	Surface Wa	ICPOE Tot.	Potassium	546	ug/L	J	5/15/2012
A72	Surface Wa	ICPOE Tot.	Sodium	1510	ug/L		5/15/2012
A72	Surface Wa	ICPOE Tot.	Strontium	310	ug/L		5/15/2012
A72	Surface Wa	ICPOE Tot.	Zinc	292	ug/L		5/15/2012
A72	Surface Wa	ICPMS Diss	Antimony		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Diss	Arsenic		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Diss	Barium	17.2	ug/L		5/15/2012
A72	Surface Wa	ICPMS Diss	Cadmium	0.902	ug/L		5/15/2012
A72	Surface Wa	ICPMS Diss	Chromium		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Diss	Cobalt	1.54	ug/L		5/15/2012
A72	Surface Wa	ICPMS Diss	Copper	4.36	ug/L		5/15/2012
A72	Surface Wa	ICPMS Diss	Lead		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Diss	Nickel	0.979	ug/L	J	5/15/2012
A72	Surface Wa	ICPMS Diss	Selenium		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Diss	Silver		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Diss	Thallium		ug/L	U	5/15/2012
A72	Surface Wa	ICPMS Diss	Vanadium		ug/L	U	5/15/2012
A72	Surface Wa	ICPOE Diss.	Aluminum	32.4	ug/L	J	5/15/2012
A72	Surface Wa	ICPOE Diss.	Beryllium		ug/L	U	5/15/2012
A72	Surface Wa	ICPOE Diss.	Calcium	31000	ug/L		5/15/2012
A72	Surface Wa	ICPOE Diss.	Iron	780	ug/L		5/15/2012
A72	Surface Wa	ICPOE Diss.	Magnesium	2340	ug/L		5/15/2012
A72	Surface Wa	ICPOE Diss.	Manganese	477	ug/L		5/15/2012
A72	Surface Wa	ICPOE Diss.	Potassium	472	ug/L	J	5/15/2012
A72	Surface Wa	ICPOE Diss.	Sodium	1550	ug/L		5/15/2012
A72	Surface Wa	ICPOE Diss.	Strontium	312	ug/L		5/15/2012
A72	Surface Wa	ICPOE Diss.	Zinc	288	ug/L		5/15/2012

A72	Surface Wa	WC - Alkali	Total Alkali	15.4	mg CaCO3 / L		5/15/2012
A72	Surface Wa	WC - Anion	Chloride		mg/L	U	5/15/2012
A72	Surface Wa	WC - Anion	Fluoride	0.2	mg/L		5/15/2012
A72	Surface Wa	WC - Anion	Nitrate/Nitrite as N		mg/L	U	5/15/2012
A72	Surface Wa	WC - Anion	Sulfate as S	71.1	mg/L		5/15/2012
A72	Surface Wa	DM-Hardn	Hardness	87	mg/L		5/15/2012

Source: U.S. EPA Scribe.net Upper Animas Database.

Location	Analysis	Analyte	Result	Units	Lab Qualifi	Date_Collected
CC18B	ICPMS Tot.	Antimony		ug/L	U	5/15/2012
CC18B	ICPMS Tot.	Arsenic		ug/L	U	5/15/2012
CC18B	ICPMS Tot.	Barium		ug/L	U	5/15/2012
CC18B	ICPMS Tot.	Cadmium	8.31	ug/L	D	5/15/2012
CC18B	ICPMS Tot.	Chromium		ug/L	U	5/15/2012
CC18B	ICPMS Tot.	Cobalt	10.6	ug/L	D	5/15/2012
CC18B	ICPMS Tot.	Copper	176	ug/L	D	5/15/2012
CC18B	ICPMS Tot.	Lead	14	ug/L	D	5/15/2012
CC18B	ICPMS Tot.	Nickel	6.97	ug/L	D	5/15/2012
CC18B	ICPMS Tot.	Selenium		ug/L	U	5/15/2012
CC18B	ICPMS Tot.	Silver		ug/L	U	5/15/2012
CC18B	ICPMS Tot.	Thallium		ug/L	U	5/15/2012
CC18B	ICPMS Tot.	Vanadium		ug/L	U	5/15/2012
CC18B	ICPOE Tot.	Aluminum	2290	ug/L		5/15/2012
CC18B	ICPOE Tot.	Beryllium		ug/L	U	5/15/2012
CC18B	ICPOE Tot.	Calcium	64100	ug/L		5/15/2012
CC18B	ICPOE Tot.	Iron	7910	ug/L		5/15/2012
CC18B	ICPOE Tot.	Magnesiun	5030	ug/L		5/15/2012
CC18B	ICPOE Tot.	Manganese	4040	ug/L		5/15/2012
CC18B	ICPOE Tot.	Potassium	518	ug/L	J	5/15/2012
CC18B	ICPOE Tot.	Sodium	1790	ug/L		5/15/2012
CC18B	ICPOE Tot.	Strontium	682	ug/L		5/15/2012
CC18B	ICPOE Tot.	Zinc	2980	ug/L		5/15/2012
CC18B	ICPMS Diss	Antimony		ug/L	U	5/15/2012
CC18B	ICPMS Diss	Arsenic		ug/L	U	5/15/2012
CC18B	ICPMS Diss	Barium	13.6	ug/L		5/15/2012
CC18B	ICPMS Diss	Cadmium	8.69	ug/L		5/15/2012
CC18B	ICPMS Diss	Chromium		ug/L	U	5/15/2012
CC18B	ICPMS Diss	Cobalt	10.5	ug/L		5/15/2012
CC18B	ICPMS Diss	Copper	172	ug/L		5/15/2012
CC18B	ICPMS Diss	Lead	7.98	ug/L		5/15/2012
CC18B	ICPMS Diss	Nickel	6.96	ug/L		5/15/2012
CC18B	ICPMS Diss	Selenium		ug/L	U	5/15/2012
CC18B	ICPMS Diss	Silver		ug/L	U	5/15/2012
CC18B	ICPMS Diss	Thallium		ug/L	U	5/15/2012
CC18B	ICPMS Diss	Vanadium		ug/L	U	5/15/2012
CC18B	ICPOE Diss.	Aluminum	2090	ug/L		5/15/2012
CC18B	ICPOE Diss.	Beryllium		ug/L	U	5/15/2012
CC18B	ICPOE Diss.	Calcium	62100	ug/L		5/15/2012
CC18B	ICPOE Diss.	Iron	7070	ug/L		5/15/2012
CC18B	ICPOE Diss.	Magnesiun	4920	ug/L		5/15/2012
CC18B	ICPOE Diss.	Manganese	3970	ug/L		5/15/2012
CC18B	ICPOE Diss.	Potassium	476	ug/L	J	5/15/2012
CC18B	ICPOE Diss.	Sodium	1810	ug/L		5/15/2012
CC18B	ICPOE Diss.	Strontium	684	ug/L		5/15/2012
CC18B	ICPOE Diss.	Zinc	3010	ug/L		5/15/2012

CC18B	WC - Alkali	Total Alkalinity		mg CaCO3	U	5/15/2012
CC18B	WC - Anion	Chloride		mg/L	U	5/15/2012
CC18B	WC - Anion	Fluoride	1.1	mg/L		5/15/2012
CC18B	WC - Anion	Nitrate/Nitrite as N		mg/L	U	5/15/2012
CC18B	WC - Anion	Sulfate as S	220	mg/L		5/15/2012
CC18B	DM-Hardn	Hardness	175	mg/L		5/15/2012

CC18: upstream of South Fork, downstream of American Tunnel confluence.
CC18B: Upstream of American Tunnel, downstream of North Fork.

Source: U.S. EPA Scribe.net Upper Animas Database.

Dissolved Metals Data

ANALYSIS DATA SHEET

CC03CA-061412-1206d

Client: URS OPERATING SERVICES SDG: 1206057 Project: 36548983/PR10141/OS-12-P-10141-WATER(DISS.)-14 DA

Lab ID: 1206057-01 % Solid: Matrix: Water Sampled: 06/14/12 Received: 06/16/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum (dissolved)	4350	78.2	200	1		EPA 6010C	2F28016	6/28/12 14:48
7440-36-0	Antimony (dissolved)		0.130	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 16:51
7440-38-2	Arsenic (dissolved)	2.39	0.700	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 16:51
7440-39-3	Barium (dissolved)	13.3	0.500	50.0	5	J, D	EPA 6020A	2F26008	6/25/12 16:51
7440-41-7	Beryllium (dissolved)	7.07	0.165	5.00	5	D	EPA 6020A	2F26008	6/25/12 16:51
7440-43-9	Cadmium (dissolved)	33.4	0.0550	5.00	5	D	EPA 6020A	2F26008	6/25/12 16:51
7440-70-2	Calcium (dissolved)	443000	3450	10000	2	D	EPA 6010C	2F28016	6/28/12 14:55
7440-47-3	Chromium (dissolved)		0.340	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 16:51
7440-48-4	Cobalt (dissolved)	90.9	0.0475	5.00	5	D	EPA 6020A	2F26008	6/25/12 16:51
7440-50-8	Copper (dissolved)	6.63	0.600	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 16:51
7439-89-6	Iron (dissolved)	90400	69.4	200	1		EPA 6010C	2F28016	6/28/12 14:48
7439-92-1	Lead (dissolved)	14.3	0.105	5.00	5	D	EPA 6020A	2F26008	6/25/12 16:51
7439-95-4	Magnesium (dissolved)	26100	1640	5000	1		EPA 6010C	2F28016	6/28/12 14:48
7439-96-5	Manganese (dissolved)	33700	6.72	20.0	2	D	EPA 6010C	2F28016	6/28/12 14:55
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 9:22
7440-02-0	Nickel (dissolved)	61.0	0.0455	5.00	5	D	EPA 6020A	2F26008	6/25/12 16:51
7440-09-7	Potassium (dissolved)	1900	1470	5000	1	J	EPA 6010C	2F28016	6/28/12 14:48
7782-49-2	Selenium (dissolved)	2.04	0.450	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 16:51
7440-22-4	Silver (dissolved)		0.0400	5.00	5	U, D	EPA 6020A	2F26008	6/25/12 16:51
7440-23-5	Sodium (dissolved)	8350	1840	5000	1		EPA 6010C	2F28016	6/28/12 14:48
7440-28-0	Thallium (dissolved)	0.154	0.0750	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 16:51
7440-62-2	Vanadium (dissolved)		0.280	25.0	5	U, D	EPA 6020A	2F26008	6/25/12 16:51
7440-66-6	Zinc (dissolved)	14700	10.2	30.0	1		EPA 6010C	2F28016	6/28/12 14:48

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.

ANALYSIS DATA SHEET

CC03D-061412-1220d

Client: URS OPERATING SERVICES SDG: 1206057 Project: 36548983/PR10141/OS-12-P-10141-WATER(DISS.)-14 DA

Lab ID: 1206057-02 % Solid: Matrix: Water Sampled: 06/14/12 Received: 06/16/12

CAS NO.	Analyte	Conc. (ug/L)	MDL	RL	D.F.	Q	Method	Sequence	Analyzed
7429-90-5	Aluminum (dissolved)	2360	78.2	200	1		EPA 6010C	2F28016	6/28/12 13:14
7440-36-0	Antimony (dissolved)		0.130	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 16:41
7440-38-2	Arsenic (dissolved)	2.16	0.700	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 16:41
7440-39-3	Barium (dissolved)	12.5	0.500	50.0	5	J, D	EPA 6020A	2F26008	6/25/12 16:41
7440-41-7	Beryllium (dissolved)	5.62	0.165	5.00	5	D	EPA 6020A	2F26008	6/25/12 16:41
7440-43-9	Cadmium (dissolved)	30.9	0.0550	5.00	5	D	EPA 6020A	2F26008	6/25/12 16:41
7440-70-2	Calcium (dissolved)	446000	3450	10000	2	D	EPA 6010C	2F28016	6/28/12 13:57
7440-47-3	Chromium (dissolved)		0.340	10.0	5	U, D	EPA 6020A	2F26008	6/25/12 16:41
7440-48-4	Cobalt (dissolved)	91.9	0.0475	5.00	5	D	EPA 6020A	2F26008	6/25/12 16:41
7440-50-8	Copper (dissolved)	5.94	0.600	10.0	5	J, D	EPA 6020A	2F26008	6/25/12 16:41
7439-89-6	Iron (dissolved)	86200	69.4	200	1		EPA 6010C	2F28016	6/28/12 13:14
7439-92-1	Lead (dissolved)	3.17	0.105	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 16:41
7439-95-4	Magnesium (dissolved)	25700	1640	5000	1		EPA 6010C	2F28016	6/28/12 13:14
7439-96-5	Manganese (dissolved)	34100	6.72	20.0	2	D	EPA 6010C	2F28016	6/28/12 13:57
7439-97-6	Mercury		0.0355	0.200	1	U	EPA 7470A	2F25012	6/25/12 9:24
7440-02-0	Nickel (dissolved)	62.1	0.0455	5.00	5	D	EPA 6020A	2F26008	6/25/12 16:41
7440-09-7	Potassium (dissolved)	1850	1470	5000	1	J	EPA 6010C	2F28016	6/28/12 13:14
7782-49-2	Selenium (dissolved)	2.36	0.450	25.0	5	J, D	EPA 6020A	2F26008	6/25/12 16:41
7440-22-4	Silver (dissolved)		0.0400	5.00	5	U, D	EPA 6020A	2F26008	6/25/12 16:41
7440-23-5	Sodium (dissolved)	8220	1840	5000	1		EPA 6010C	2F28016	6/28/12 13:14
7440-28-0	Thallium (dissolved)	0.153	0.0750	5.00	5	J, D	EPA 6020A	2F26008	6/25/12 16:41
7440-62-2	Vanadium (dissolved)		0.280	25.0	5	U, D	EPA 6020A	2F26008	6/25/12 16:41
7440-66-6	Zinc (dissolved)	14500	10.2	30.0	1		EPA 6010C	2F28016	6/28/12 13:14

Environmental Testing Laboratories

CompuChem

A Division Of

Liberty Analytical Corp.