Final
Preliminary Assessment/Site Inspection Report for the Mammoth Mining Company Stamp Mill Site Inyo National Forest, Mono County, California

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Submitted by:
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Abbreviations and Acronyms

ABA	acid base accounting
Basin Plan	Water Quality Control Plan for the Lahontan Region
BLM	Bureau of Land Management
BTVs	background threshold values
CAM	California Assessment Manual
CDFW	California Department of Fish and Wildlife
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COCs	chemicals of concern
COPCs	chemicals of potential concern
CSM	conceptual site model
DTSC	Department of Toxic Substances Control
Eco-SSLs	ecological soil screening levels
EPA	U.S. Environmental Protection Agency
ERRG	Engineering/Remediation Resources Group, Inc.
FEMA	Federal Emergency Management Agency
Forest Service	U.S. Department of Agriculture, Forest Service Region 5
ft^2	square feet
HHRA	human health risk assessment
HI	hazard index
ILCR	incremental lifetime cancer risk
NOAA	National Oceanographic and Atmospheric Administration
OEHHA	Office of Environmental Health Hazard Assessment
PA/SI	Preliminary Assessment/Site Inspection
PPE	probable point of entry
RBCs	risk-based concentrations
RMC	risk management criteria

Abbreviations and Acronyms *(continued)*

RPA	Removal Preliminary Assessment
RSLs	regional screening levels
SDLs	soluble designated levels
SPLP	synthetic precipitation leaching procedure
SWRCB	State Water Resources Control Board
TCLP	toxicity characteristic leaching procedure
TELs	threshold effect levels
USGS	U.S. Geological Survey
Water Board	Lahontan Regional Water Quality Control Board
XRF	x-ray fluorescence device
yd^3	cubic yards

Section 1. Introduction

Engineering/Remediation Resources Group, Inc. (ERRG) has prepared this Preliminary Assessment/Site Inspection (PA/SI) Report for the U.S. Department of Agriculture, Forest Service Region 5 (Forest Service) for the Mammoth Mining Company Stamp Mill Site on the Inyo National Forest in Mono County, California (Figure 1). This work was conducted under Regional A/E Indefinite Quantity Contract for Environmental Site Response Activities No. AG-91S8-C-11-0001, Activity I, Task 3, Combined PA/SI.

1.1. PURPOSE

The purpose of this PA/SI is to assess whether metals from former stamp mill operations at the site are being released to the environment at concentrations that are hazardous to human health or the environment. ERRG conducted the following tasks as part of this PA/SI:

- Reviewed available historical documents and environmental data to aid in site characterization
- Performed reconnaissance to document existing site conditions and collect soil and waste pile, sediment, and surface water samples for analysis of potential site contaminants
- Compared analytical results with background and human health and ecological criteria to identify chemicals of potential concern (COPCs)
- Evaluated the level of risk to human receptors from chemicals of concern (COCs) at the site
- Evaluated environmental pathways of contamination to downstream or nearby targets

This PA/SI was conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the following guidance from U.S. Environmental Protection Agency (EPA):

- "Guidance for Performing Preliminary Assessments Under CERCLA" (EPA, 1991)
- "Guidance for Performing Site Inspections Under CERCLA, Interim Final" (EPA, 1992)
- "Improving Site Assessment: Combined PA/SI Assessments" (EPA, 1999)

1.2. REPORT ORGANIZATION

The remainder of this report is organized as follows:

- Section 2 describes the site, its history, environmental setting, geology and hydrogeology, land use and sensitive species, and previous investigations at the site, including an evaluation of historical data.
- Section 3 summarizes the records review, site reconnaissance activities, and sample collection and analytical methods
- Section 4 summarizes the data evaluation and results of the streamlined human health risk assessment (HHRA)
- Section 5, presents a preliminary analysis of potential environmental pathways at the site.
- Section 6 presents the conclusions and recommendations of the PA/SI.
- Section 7 lists the guidance and historical documents used to prepare this PA/SI Report.

Figures and tables are presented after Section 6. The following supplemental information is appended to this PA/SI Report:

- Appendix A, Previous Investigation Results
- Appendix B, Photographic Log
- Appendix C, Field Screening Results
- Appendix D, Laboratory Analytical Data
- Appendix E, Background Threshold Value (BTV) Analysis
- Appendix F, Streamlined HHRA

Section 2. Site Background

This section describes the Mammoth Mill Site, its operational history, environmental setting, geology and hydrogeology, land use and sensitive species, and previous investigations, and includes an evaluation of historical data.

2.1. SITE DESCRIPTION

The Mammoth Mill Site, hereinafter referred to as "the site," is a former gold ore processing facility dating from the late 1870s. It is within the town of Mammoth Lakes in Mono County, California, about 4 miles east of Highway 395, at an elevation of 8,370 feet above mean sea level. Figure 1 shows the site location and surrounding area.

The site is located within an area historically known as "Mill City," because of the past gold mining activity in the region (Forest Service, 2014). The site is within the geographic boundaries of the town of Mammoth Lakes, California, and is located about 1 mile due east of Twin Lakes, California. It is found in the northeast quarter of the northeast quarter of Section 9, Township 4 South, Range 27 East. It is represented on the Bloody Mountain Quadrangle 7.5-Minute Series topographic map (U.S. Geological Survey [USGS], 1994). The site is wholly on National Forest System lands administered by the Mammoth Ranger District of the Inyo National Forest (Forest Service, 2014). The site can be accessed from Old Mammoth Road, either at the end of the Mill City Tract or from the Mary Townsend grave site trailhead (Forest Service, 2014). The site includes the remnants of the Mammoth Mining Stamp Mill, most notably the iron flywheel, five waste piles, recreational cabins and sheds, and a dry diversion trench that connects to a flowing perennial tributary to Mammoth Creek. Figure 2 shows the site features.

2.2. SITE HISTORY

Mining in the area of the site began in the late 1870s. During this period, ore was extracted from claims to the southwest of the site at the Old Mammoth Mine. The Mammoth Mining Company purchased and consolidated five of the claims and needed a nearby mill to process the ore (Caldwell, 1990). Construction of a 20-stamp mill began in July 1878 and was an integral part of the development of the Mammoth Lakes Mining District. The Mammoth Mining Company operated the mill on a seasonal basis from 1878 to 1880 (Caldwell, 1990).

2.2.1. Mill Construction and Operation

The following historical information was taken from *Mammoth Gold—The Ghost Towns of Lake District* (Caldwell, 1990), unless otherwise noted.

The mill was powered by a waterwheel fed by water diverted from Twin Lakes along a flume. As a result, the mill could only operate when there was enough flowing water to run the water wheel. Freezing temperatures prohibited mill operation during the winter months. In 1879, the mill was retrofitted to repair damage sustained during the winter and an additional 20 stamps and a steam engine were added. However, the steam engine was never operated because the boiler needed to run the steam engine fell into a canyon on its way to the mill and was never installed (Davis, 2014). In winter 1879–1880, the mill shut down because of heavy snow, sparking a lack of confidence in the profitability of the Mammoth Mining Company and a decline in stock prices. The mill resumed operations in July 1880 only to shut down again for good in October 1880 because of a lack of financing and ongoing difficulties in supplying the mill with ore (Caldwell, 1990). Shortly after the mill shut down, the company town of Mammoth City, which had supported mining operations, burned down and all of the Mammoth Mining Company's records were destroyed. After the fire and mill closure, rumors persisted that the entire operation had been a stock scam. The mill and the surrounding land were sold at auction sometime after it was shut down. Most of the mill components were removed for use at other mills in the area. The extraction techniques used at the Mammoth Mill were somewhat primitive and did not fully extract all of the available gold and silver. Superior techniques for extracting metals were in use just a few years after the mill shut down. It is likely that most of the tailings from the mill were removed from the site and taken to the nearby town of Bodie for reprocessing to extract the remaining metals (Davis, 2014).

2.2.2. Ore Processing

Ore from the Mammoth area was considered a complex ore, containing both gold and silver at economically viable concentrations (Caldwell, 1990). The geologic processes that concentrated gold and silver in the ore also concentrated other metals, including arsenic, copper, iron, lead, and zinc. Crushing the ore to extract gold and silver, would have also made other metals in the ore more mobile in the environment.

Stamp mills, such as the Mammoth Mill, depended on the use of mercury to separate gold and silver from ore that had been crushed in the stamp mill. The process involved breaking the ore from cobbles and boulders into smaller particles, ranging in size from coarse sand to silt. Particles were suspended in water to which mercury was added; the slurry was then passed over a corrugated surface or was otherwise agitated (Meyerriecks, 2003, as cited in Forest Service, 2014). The gold or silver and mercury would amalgamate to form a paste. This amalgam was then heated to evaporate and recover the mercury and leave the gold or silver (Meyerriecks, 2003, as cited in Forest Service, 2014). Tailings left over from this process were typically deposited near the mill site and allowed to dry. Tailings commonly have significantly elevated concentrations of mercury, because not all mercury was recovered or reused during processing. Mercury is typically present in tailings in its elemental metallic form, which is not very soluble. However, the tailings may be highly mobile because of their small particle size, which are easily transported by wind and surface water flow. In addition, mercury can be converted to methyl mercury in anaerobic aquatic environments if it is deposited into surface water bodies. Methyl mercury is a toxic chemical and tends to

bioaccumulate in the food chain and is considered a COPC at sites where mercury is present at elevated concentrations (EPA, 2000).

2.3. ENVIRONMENTAL SETTING

The site is located on the Inyo National Forest, within the Long Hydrologic Area, designated as Unit 603.10 in the "Water Quality Control Plan for the Lahontan Region" (Basin Plan) (Lahontan Regional Water Quality Control Board [Water Board], 1995). The site is in an area of the forest that is heavily used for recreation and includes 21 recreational cabins along the Mill City Tract, of which 6 cabins (7, 8, 9, 12, 13, and 26) are in close proximity to the site along the southernmost portion of the Mill City Tract and downgradient of the site (Figure 2). Section 2.5 summarizes the sensitive species and habitat at the site.

The region receives 22.95 inches of annual precipitation, with the rainy season generally between November and March. The average annual total snowfall is 206.0 inches based on annual records beginning in 1993 (Western Regional Climate Center, 2014). The site is identified on Mono County Flood Insurance Rate Map 06051C1625D to be in an area with less than a 0.2 percent annual chance of flooding (Federal Emergency Management Agency [FEMA], 2011).

2.4. GEOLOGY AND HYDROGEOLOGY

The site is located on the eastern edge of the Sierra Nevada geomorphic province and just south of the western edge of Long Valley Caldera (Harden, 1998). The Sierra Nevada province is characterized by massive granitic rocks that are between 210 and 80 million years old (Harden, 1998). Native gold is common within the Sierra Nevada geomorphic province and is typically found in quartz veins emplaced along shear zones through the migration of hydrothermal fluids (Harden, 1998). The Sierra Nevada fault, which runs along the eastern edge of the Sierra Nevada mountains through the area of the site, became active about 3 million years ago and created the high relief and steep slopes of the eastern Sierra (USGS, 2014b). The Long Valley Caldera is a much more recent geologic feature, which is the result of a volcanic super eruption that occurred about 760,000 years ago (USGS, 2014b). The most recent eruption inside the caldera occurred about 50,000 years ago (USGS, 2014c). The nearby Mammoth Mountain (northwest of the site) was built up by a series of approximately 25 eruptions that were fed by a magma body distinct from the caldera's source; this volcanic activity dates between 110,000 and 57,000 years ago (USGS, 2014a). The Long Valley Caldera is a currently active geothermal region (USGS, 2014c).

2.5. LAND USE AND SENSITIVE SPECIES

The site drains through a perennial tributary to Mammoth Creek, which runs north–northeast along the eastern edge of the site. Mammoth Creek flows eastward through the town of Mammoth Lakes. The creek name changes to Hot Creek east of Highway 395, and eventually flows into the Owens River and into a series of playa lakes. Sensitive habitats have not been previously identified at or downstream of the site.

The former mill building and the waste piles are located west of the Mill City Tract, a collection of privately owned recreational cabins built on land owned by the Inyo National Forest and leased to the cabin owners. The Mill City Tract is accessed by Mill City Tract Road, to the south of Old Mammoth Road. The site is populated during the summer months, primarily on weekends and is a popular destination for hikers because of interest in the historic mill foundations and flywheel. A trail passes between the mill and the waste piles, identified by a sign southeast of the site as "main trail" (Figure 2). The closest recreational cabins (7, 8, 9, 12, 13, and 26) are located within 100 feet of the waste piles and are accessible via an unpaved road by two-wheel drive vehicles. The waste piles and mill remnants are accessible on foot. During the site visits conducted in July 2014 and June 2015, cabin residents and hikers were observed at the site.

Based on site reconnaissance, the site consists of two sub-areas with different current uses: the Mill Area consists of the waste piles and mill remnants, and the Cabins Area consists of Cabins 7, 8, 9, 12, 13, and 26 and cabin grounds, which are downgradient from the site. Cabin 29 was not considered part of the Cabins Area because it is located on the east side of the tributary, thus it is not downgradient from the site. The two sub-areas are shown on Figure 2. This PA/SI considered each of these areas separately based on their distinct historic uses (i.e., mill activities were limited to the Mill Area) and the current use (cabin occupation is limited to the Cabins Area).

In accordance with EPA guidance, the areas within a 4-mile radius and 15 miles downstream of the site were evaluated for possible human and ecological receptors (EPA, 1991). Sensitive habitat identified within a 4-mile radius of the site is known to be used by a number of rare and threatened species, including California tiger salamander (*Ambystoma californiense*), Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*), and Paiute cutthroat trout (*Oncorhynchus clarkii seleniris*), which are federally listed as threatened species (California Department of Fish and Wildlife [CDFW], 2014). Tables 1 and 2 present a complete list of special-status animal species and special-status plant species that are potentially present within the 4-mile radius or 15-mile downstream target distance of the site (Figure 3). These species have been identified within Bloody Mountain, Mammoth Mountain, Crystal Crag, and Old Mammoth quadrangles.

A query of the State Water Resources Control Board's (SWRCB) GeoTracker groundwater database indicated that 32 groundwater monitoring wells are located within the 4-mile target distance limit (SWRCB, 2014a). SWRCB also has records for nine drinking water wells within the 4-mile target distance (Table 3; SWRCB, 2014b). The SWRCB water rights directory (eWRIMS) shows eight surface water rights claims within the 15-mile downstream target distance (SWRCB, 2014c). The exact use of these rights is not public information. The Mammoth Community Water District obtains drinking water for the city of Mammoth Lakes from an intake at Lake Mary, which is situated within the 4-mile target distance, but is located upstream of the site (Mammoth Community Water District, 2014).

2.6. PREVIOUS INVESTIGATIONS

A water quality study for the Upper Owens River (which included Mammoth Creek and its tributaries) identified elevated metals, most notably mercury in the unnamed tributary to Mammoth Creek in samples collected in 2012 and 2013 (California Trout, Inc., 2014). The preliminary results of this study (published in 2014) triggered further investigation at the site due to a concern that metals present in mine waste might be migrating off site.

In response to the elevated mercury concentrations detected in the Upper Owens River study, the Forest Service conducted a Removal Preliminary Assessment (RPA) at the Mammoth Mill (Forest Service, 2014). In 2013, the Forest Service collected samples using a hand-held x-ray fluorescence (XRF) device to further analyze metals concentrations at the site. XRF results indicated that arsenic, lead, and mercury were present at elevated concentrations in soil at the site. Arsenic and mercury concentrations exceeded background concentrations in seven of eight soil samples, and lead concentrations exceeded the background concentration in all eight samples (Forest Service, 2014).

XRF sampling results were compared with the following screening criteria to evaluate the potential risk to humans and wildlife from metals in soil:

- Human Health: Bureau of Land Management (BLM) risk management criteria (RMC) for campers exposed to soil (BLM, 2004)
- Wildlife: BLM RMC for wildlife exposed to soil (BLM, 2004)

Arsenic concentrations in soil exceeded the background concentration and human health screening criterion, but did not exceed the ecological screening criterion in seven of the eight samples collected. Lead concentrations in soil exceeded the background concentration and human health screening criterion in one sample and the ecological screening criterion in seven samples. Mercury concentrations exceeded the human health screening criterion in five samples and the ecological screening criterion in seven of eight samples (Forest Service, 2014). Sediment and surface water samples were not collected during the RPA; however, sediment and surface water results of the Upper Owens River report were included in the RPA Report (Forest Service, 2014). Appendix A summarizes the RPA screening results.

Section 3. Preliminary Assessment/Site Inspection Activities

The PA/SI included the following tasks:

- Records review
- Site reconnaissance
- Collection and analysis of source material (i.e., soil and waste pile), background soil, sediment, and surface water samples for metals

The following subsections describe the activities performed during each of the tasks listed above.

3.1. RECORDS REVIEW

ERRG reviewed available historical documentation and environmental data, including historical reports, aerial photographs, regional geologic maps, topographic maps, climate data, and ecological data available from USGS, National Oceanographic and Atmospheric Administration (NOAA), Western Regional Climate Center, CDFW, FEMA, Department of Water Resources, and the Water Board to establish the site's environmental setting (Section 2.3).

On July 29, 2014, ERRG visited the Inyo National Forest offices in Bishop, California, to conduct a records review. The Forest Service provided ERRG with Forest Service documents relating to the site, including the complete text of the "Upper Owens River Water Quality Project Final Technical Report" (California Trout, Inc., 2014). On August 1, 2014, ERRG visited the Mammoth Ranger District offices and conducted an additional records review; however, no records relating to mill operations or previous environmental investigations were found. Also on August 1, 2014, ERRG visited the Mammoth Museum located inside the Hayden Cabin and spoke to local historian Mr. Mark Davis. Mr. Davis provided a brief overview of the history of mining in the area, as well as some historical photographs of the mill shortly after it ceased operation (Appendix B, Photographs B-1 through B-4).

3.2. SITE RECONNAISSANCE

From July 28 through August 1, 2014, ERRG performed a site reconnaissance to document existing site conditions. During the site reconnaissance, all accessible site features, including waste piles, mill foundation remnants, cabins, roads, trails, and sample locations were mapped using a Trimble Geo-XT hand-held global positioning system. Site features were also photo-documented, and Appendix B includes the photographs.

The site covers approximately 5 acres and consists of the former mill building (foundation remnants and a large iron flywheel) (Appendix B, Photographs B-5 through B-10), five waste piles (Appendix B, Photographs B-11 through B-21), the six southernmost cabins (7, 8, 9, 12, 13, and 26) on the Mill City Tract (Appendix B, Photographs B-15, B-16, B-20, and B-22 through B-29), a diversion trench (Appendix B, Photographs B-22, B-23, and B-30 through B-36), a trail (Appendix B, Photograph B-37), and a road. The site is moderately vegetated, primarily with trees but also bushes and ground cover. All portions of the site are easy to access from Mill City Tract Road. A perennial unnamed tributary to Mammoth Creek flows to the north–northeast along the eastern edge of the site. Five waste piles were identified near the mill remnants during site reconnaissance. The waste piles are located primarily downslope of the mill.

Waste Pile 1 is located directly downslope of the mill foundations to the northeast (Figure 2). Pile 1 is wedge-shaped in profile and approximately 10 feet thick. It covers an area of about 2,800 square feet (ft^2), for an estimated total volume of 630 cubic yards (yd^3). The pile is about 60 percent vegetated, including trees, brush, and ground cover. In addition to vegetation, the pile is covered with several inches of vegetative debris and deadfall. Approximately 20 percent of the pile is exposed soil. Large trees are present on the pile, indicating the pile has been in place for some time, is likely to be stable, and is unlikely to pose a significant erosion hazard. The waste material consists of 40 percent cobbles, up to 10 inches in diameter, with the remaining 60 percent evenly distributed gravels, sand, and fines. Appendix B includes photographs (B-11 and B-12) of Waste Pile 1.

Waste Pile 2 is located to the northwest of Waste Pile 1, downslope and north of the mill foundations (Figure 2). Waste Pile 2 is wedge-shaped in profile and approximately 5 feet thick. It covers an area of approximately 3,700 ft^2, for an estimated total volume of 600 yd^3. About 20 to 30 percent of Waste Pile 2 is vegetated, including trees, brush, and ground cover. In addition to vegetation, the pile is covered with several inches of vegetative debris and deadfall. Less than 10 percent of the pile's surface is exposed soil. Large trees are present on the pile, indicating the pile has been in place for some time, is likely to be stable, and is unlikely to pose a significant erosion hazard. The waste material consists of 40 percent cobbles, up to 10 inches in diameter, with the remaining 60 percent evenly distributed gravels, sand, and fines. Appendix B includes photographs (B-12 through B-14) of Waste Pile 2.

Waste Pile 3 is located southeast of Waste Pile 1 and east of the mill foundation (Figure 2). Waste Piles 1 and 3 are separated by the diversion trench, which likely diverted water coming from the mill back into the creek. Waste Pile 3 is wedge-shaped in profile and is approximately 8 feet thick. It covers an area of about 5,400 ft^2, for an estimated total volume of 890 yd^3. Waste Pile 3 is about 30 to 40 percent vegetated, including trees, brush, and ground cover. In addition to vegetation, the pile is covered with several inches of vegetative debris and deadfall. Less than 10 percent of the pile is exposed soil. Large trees are present on the pile, indicating the pile has been in place for some time, is likely to be stable, and is unlikely to pose a significant erosion hazard. The waste material consists of 40 percent cobbles, up to 10 inches in diameter,

with the remaining 60 percent evenly distributed gravels, sand, and fines. The eastern edge of the pile is armored with boulders. Appendix B includes photographs (B-15 and B-16) of Waste Pile 3.

Waste Pile 4 is located to the southeast of Waste Pile 3 (Figure 2). Waste Pile 4 is approximately 4 feet thick and covers an area of approximately 920 ft^2, for an estimated volume of 70 yd^3. Material at Waste Pile 4 consists of about 90 percent cobbles, with a thick layer of debris and deadfall on top (at the southeast side of the pile) and 10 percent fines at the northwest end of the pile. No soil was exposed on the surface. The fines were yellowish, well-sorted, and silt-sized. The fines were the only fine material identified in Waste Pile 4, and the only material identified at the site that appeared to be processed mill tailings (Appendix B, Photograph B-44). Appendix B includes photographs (B-17 and B-18) of Waste Pile 4.

Waste Pile 5 is located upslope and to the southeast of the mill (Figure 2). The pile is irregularly shaped, but is thick in the center and tapers off rapidly to the edges. It is approximately 15 feet thick and covers an area of approximately 8,500 ft^2, for an estimated volume of 2,100 yd^3. Waste Pile 5 is about 30 to 40 percent vegetated, including trees, brush, and ground cover. In addition to live vegetation, the pile is covered with several inches of vegetative debris and deadfall. Less than 10 percent of the pile's surface is exposed soil. The waste material consists of 40 percent cobbles, up to 10 inches in diameter, with the remaining 60 percent evenly distributed gravels, sand, and fines. Appendix B includes photographs (B-18 through B-21) of Waste Pile 5.

3.3. SAMPLE COLLECTION AND ANALYSIS

During the 2014 site reconnaissance, ERRG field screened for metals in source material and mercury in vapor and collected source material, sediment, and surface water samples for laboratory analysis. All field screening activities were conducted prior to the collection of laboratory analytical samples.

3.3.1. Field Screening

A hand-held XRF analyzer was used to screen source material (i.e., soil and waste pile). XRF screening locations were selected based on visual assessment. The results of the XRF screening were used to identify the sample locations for laboratory analysis. Laboratory soil samples were collected at the XRF sample locations with the highest concentrations of arsenic, mercury, and lead within each area of the site (waste piles, diversion trench, cabin areas, etc.). XRF screening was also conducted every 50 feet along the diversion trench leading from the mill to the tributary to Mammoth Creek. The XRF data were used to help evaluate the surface water pathway; no surface water runoff was present in the ditch. Appendix C provides the XRF screening results and locations.

A Lumex Ra-915 meter was used to screen for mercury vapor around the four cabins closest to the waste piles. Appendix C includes the field screening results and locations.

3.3.2. Sample Collection and Analysis

Samples for laboratory analysis were collected at the site in two phases: (1) from July 29 and August 1, 2014, and (2) from June 2 through 4, 2015. During the first sampling event, 15 soil, 3 sediment, 3 surface water, and 1 background soil sample were collected. The initial sample results were evaluated to inform the second sampling event in 2015. During the second sampling event, an additional 22 soil samples, 5 sediment samples, 5 waste pile samples, and 9 background samples were collected. Figures 4, 5, 6, and 7 show the soil, background, waste pile, and sediment and surface water sample locations, respectively.

All samples were collected and analyzed in a manner consistent with EPA's "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846" (EPA, 2008) and in accordance with the approved Final Work Plan and Work Plan Addendum (ERRG, 2014 and 2015). Additionally, surface water samples were analyzed in the field for water quality parameters (pH, dissolved oxygen, conductivity, and turbidity), as presented in Table 4. Appendix B includes photographs (B-39 through B-120) of the sampling locations.

The following subsections summarize the sample collection methods used during the 2014 and 2015 sampling events.

3.3.2.1. July/August 2014 Sampling Event

During the initial sampling event, soil samples were collected at the 15 locations with the highest metals concentrations based on the results of the XRF field screening. The soil samples were collected from each of the five waste piles, the Mill Area, the Cabins Area, and the diversion trench. Additionally, one background soil sample was collected from an upgradient location not impacted by mining activities for comparison purposes. Figure 4 shows the soil sample locations.

Sediment and surface water samples were collected upstream of the site, representing background conditions, at the probable point of entry (PPE), which is defined as the "the point at which entry of the hazardous substances to surface water is most likely" (EPA, 2012b), and downstream of the PPE (Figure 7). Waste material was not observed to be in direct contact with the creek, so the PPE was determined to be the point at which the dry diversion trench, presumed to have supplied the water which operated the mill, enters the creek. This is the most likely pathway for waste material from the mill to enter the surface water pathway. Figure 7 shows the sediment and surface water sample locations.

Samples were collected with disposable sampling equipment and placed in laboratory-provided sample containers in accordance with the approved Final Work Plan (ERRG, 2014). Water samples were filtered in the field with a syringe and a disposable 0.45-micron filter. Samples were placed in a cooler with ice for transport to TestAmerica Laboratories in Pleasanton, California, a California-certified analytical laboratory. All soil, sediment, and background soil samples were analyzed for California Assessment Manual (CAM)-17 metals by EPA Method 6010B, mercury by EPA Methods 7470 and 7471, and paste pH by EPA Method 9045. The three soil samples (MM-S-01, MM-S-04, and MM-S-09) that exhibited the highest

metals concentrations were also analyzed for leachability by synthetic precipitation leaching procedure (SPLP) (EPA Method 1312) and toxicity characteristic leaching procedure (TCLP) (EPA Method 1311). Surface water samples were analyzed for CAM-17 metals (both total and dissolved) by EPA Method 6010B, total and dissolved mercury by EPA Methods 7470 and 7471, and total hardness by EPA Method 130.2. Appendix D provides the complete laboratory analytical reports.

3.3.2.2. June 2015 Sampling Event

Based on a preliminary evaluation of site data, 6 additional soil samples were collected from the waste piles and Mill Area and 16 additional samples were collected from the Cabins Area (Figure 4). To further characterize the surface water pathway, five sediment samples were collected from the dry diversion trench (Figures 4 and 7). To provide a more robust background screening data set, nine background soil samples were collected from nearby locations unlikely to have been impacted by mining activities (Figure 5). Five waste pile samples were also collected: four composite samples from Waste Piles 1, 2, 3, and 5 and one discrete sample from Waste Pile 4 (due to its small size [less than 10 yd^3]) (Figure 6).

Samples were collected with disposable sampling equipment and placed in laboratory-provided sample containers in accordance with the approved Final Work Plan and Work Plan Addendum (ERRG, 2014 and 2015). All samples were placed in a cooler with ice for transport to the analytical laboratories. Soil and sediment samples were submitted to TestAmerica Laboratories in Pleasanton, California, a California-certified analytical laboratory. Waste pile samples were submitted to Pace Analytical Laboratories in Davis, California, a California-certified analytical laboratory. All samples were analyzed for CAM-17 metals by EPA Method 6010B, mercury by EPA Methods 7470 and 7471, and waste pH by EPA Method 9045. Additionally, the waste pile samples were analyzed for acid base accounting (ABA) by Modified Sobek Method 3.2. Appendix D provides the complete laboratory analytical data.

Section 4. Data Evaluation and Risk Assessment

All data collected during this PA/SI were screened against background and human health and ecological criteria to identify if a release has occurred at the site and inform the analysis of environmental pathways (see Section 5). The data were further evaluated in a streamlined HHRA to identify the relative level of risk associated with the site as well as specific areas of the site. Section 4.1 describes the screening criteria used during the data evaluation, Section 4.2 summarizes the data evaluation results, and Section 4.3 summarizes the results of the streamlined HHRA.

4.1. PA/SI SCREENING CRITERIA

This section describes the calculation of BTVs, as well as the human health and ecological screening criteria selected for the data evaluation.

4.1.1. Background Threshold Values

Ten background soil samples were collected from areas outside the site and upslope/upstream from mining operations (Figure 5). Metals concentrations in the background samples reflect naturally occurring metals and represent uncontaminated media. A statistical analysis of the background concentrations was conducted to identify soil and sediment BTVs for screening purposes. To calculate the BTVs, the concentrations for each metal were evaluated and outliers were removed from the data set. Outliers were concentrations that were inconsistent with the rest of the data set (either much higher or much lower). Outliers were identified statistically using EPA's "ProUCL Version 5.0.00 – Technical Guide Statistical Software for Environmental Applications for Data Sets With and Without Nondetect Observations" (EPA, 2013). BTVs were then calculated based on the 95 percent upper confidence limit with the remaining data (EPA, 2013). A BTV could not be calculated for thallium because thallium was not detected in any background samples. Appendix E presents the complete statistical analysis and BTV calculations.

For surface water, the downstream sample results were compared with the single upstream background concentration.

4.1.2. Human Health Criteria

Human health criteria for source material (i.e., soil and waste piles), sediment, and surface water have been selected for this project based on recommended levels and regulatory limits. Primary and secondary screening criteria were selected for source material, sediment, and surface water. The EPA has developed regional screening levels (RSLs) for soil for the protection of residents. The RSLs were determined to be the most appropriate criteria for the site based on the presence of recreational residences in close proximity

to contaminated areas. The BLM has developed RMC for sediment and surface water for the protection of campers, boaters, and swimmers exposed to metals at BLM mining sites (BLM, 2004). The BLM RMC for sediment and surface water for protection of campers were selected as the most appropriate screening criteria based on current site use. RSLs are not available for sediment and surface water. Where primary criteria are unavailable, secondary human health criteria were selected. Primary and secondary human health criteria for source material, sediment, and surface water were selected as follows:

- Human Health Criteria for Source Materials
  - Primary – EPA RSLs for residential soil (EPA, 2015a)
  - Secondary – BLM RMC for soil for the protection of residents (BLM, 2004)
- Human Health Criteria for Sediment
  - Primary – BLM RMC for sediment for the protection of campers (BLM, 2004)
  - Secondary – EPA RSLs for residential soil (EPA, 2015a)
- Human Health Criteria for Surface Water
  - Primary – BLM RMC for surface water for the protection of campers (BLM, 2004)
  - Secondary – Maximum contaminant levels for drinking water (EPA, 2009)

4.1.3. Ecological Criteria

The following ecological criteria for source materials (i.e., soil and waste piles), sediment, and surface water have been selected for this project based on recommended levels and regulatory limits:

- Ecological Criteria for Source Materials – EPA ecological soil screening levels (Eco-SSLs). Eco-SSLs are concentrations of contaminants in soil that are protective of ecological receptors that commonly come into contact with or consume biota that live in or on soil. Eco-SSLs were developed for plants, soil invertebrates, birds, and mammals to provide protection for terrestrial ecosystems (EPA, 2015b). The lowest (most conservative) values will be used.
- Ecological Criteria for Sediment – Threshold effects levels (TELs), as presented in the NOAA Screening Quick Reference Tables (commonly referred to as "SQuiRTs") for sediment. TELs were developed to evaluate sediment quality in freshwater ecosystems and for the protection of invertebrates living in freshwater sediment (NOAA, 2008).
- Ecological Criteria for Surface Water – EPA's National Recommended Water Quality Criteria, which were developed for protection of freshwater aquatic life (EPA, 2012a).

4.2. DATA EVALUATION RESULTS

This section summarizes the comparison of field screening results (see Section 4.2.1) and laboratory analytical data with selected screening criteria for each type of sample collected (i.e., soil or waste pile, sediment, and surface water) at the site (see Sections 4.2.2 through 4.2.6). Soil sample results for the Mill Area and the Cabins Area were evaluated separately (Figure 2). All analytical data were first screened

against the BTVs to identify COPCs, which were then screened against the human health and ecological screening criteria to identify the primary COCs in each medium (i.e., metals at concentrations exceeding background, human health, and ecological screening criteria). Additionally, the three samples with the highest metals concentrations (MM-S-01, MM-S-04, and MM-S-09) were analyzed for leachability by SPLP (see Section 4.2.7). Section 4.2.8 summarizes the results of the data quality assessment.

4.2.1. Field Screening Results

During the July 2014 sampling event, XRF readings were collected as a field screening tool to guide the selection of soil and sediment sample locations. XRF soil results indicated antimony, arsenic, cobalt, lead, and mercury concentrations exceeded background and human health and ecological screening criteria (see Table C-1 in Appendix C). XRF results for sediment indicated arsenic, lead, and mercury were present along the bottom of the diversion trench (Figures C-1 through C-3 in Appendix C).

Results were not intended to be used to identify the extent of contamination, but rather to help target the laboratory sample locations to ensure that areas with the highest metals concentrations were sampled. XRF data were subsequently compared with laboratory data from the same locations to establish whether a correlation existed between the two data sets. Comparison of XRF results and laboratory results showed a poor correlation between the two data sets. When compared with the laboratory results, the XRF results were higher than the laboratory results 82 percent of the time. These results indicate a high likelihood that metals concentrations are generally lower than the XRF results indicate. XRF results were, therefore, considered usable as a conservative screening tool to establish the likely presence or absence of contamination, recognizing the results likely over-estimate the extent and severity of contamination. Laboratory results, rather than XRF results, were relied upon to evaluate risks to human health and the environment and to establish the likely extent of contamination. Appendix C presents the XRF and laboratory data and correlation evaluation.

Lumex readings indicated that mercury vapor concentrations were less than residential EPA RSLs for mercury in air (EPA, 2015a). Appendix C includes the results for mercury vapor samples.

4.2.2. Soil Sample Results, Mill Area

Table 6 and Figure 4 summarize the data evaluation of the soil samples collected from the Mill Area. Background screening results indicated the following metals were present in soil samples at concentrations greater than their respective BTVs:

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Cobalt
- Copper
- Lead
- Mercury
- Molybdenum
- Nickel
- Selenium
- Silver
- Zinc

The above metals were then screened against their respective human health and ecological screening criteria presented in Section 4.1. The data evaluation results are summarized below.

- Antimony, arsenic, lead, and mercury concentrations exceeded both human health and ecological screening criteria, thus these metals are considered to be the primary COCs in soil at the Mill Area.
- Barium, cadmium, cobalt, copper, selenium, silver, and zinc exceeded ecological screening criteria but were less than human health screening criteria.
- Beryllium, molybdenum, and nickel concentrations were less than both human health and ecological screening criteria.

The pH of waste material and soil samples ranged from 5.39 (MM-S-24) to 6.37 (MM-S-03) (Table 6).

4.2.3. Soil Sample Results, Cabins Area

Table 7 and Figure 4 summarize the data evaluation of soil samples from the Cabins Area. Background screening results indicated the following metals were present in soil samples at concentrations greater than their respective BTVs:

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Copper
- Lead
- Mercury
- Molybdenum
- Selenium
- Silver
- Zinc

The above metals were then screened against their respective human health and ecological screening criteria presented in Section 4.1. The data evaluation results are summarized below.

- Arsenic and mercury exceeded both human health and ecological screening criteria, thus these metals are considered to be the primary COCs in soil at the Cabins Area.
- Antimony, barium, cadmium, copper, lead, selenium, silver, and zinc exceeded ecological screening criteria but were less than human health screening criteria.
- Beryllium and molybdenum concentrations were less than both human health and ecological screening criteria.

The pH of soil samples ranged from 4.89 (MM-BG-13) to 6.21 (MM-S-14) (Table 7).

4.2.4. Composite Waste Pile Sample Results

Table 8 and Figure 6 summarize the data evaluation of the four composite samples and one discrete sample collected from the five waste piles. Background screening results indicated the following metals were present in the waste pile samples at concentrations greater than their respective BTVs:

- Antimony
- Arsenic
- Barium
- Chromium
- Cobalt
- Copper
- Lead
- Mercury
- Molybdenum
- Nickel
- Silver
- Zinc

The above metals were then screened against their respective human health and ecological screening criteria presented in Section 4.1. The data evaluation results are summarized below.

- Arsenic and mercury exceeded both human health and ecological screening criteria, thus these metals are considered to be the primary COCs in the waste piles.
- Antimony, barium, copper, lead, silver, and zinc exceeded ecological screening criteria but were less than human health screening criteria.
- Chromium, cobalt, molybdenum, and nickel concentrations were less than both human health and ecological screening criteria.

ABA analysis was also conducted on waste pile composite samples. The ABA results (summarized in Table 9) show that sulfur compounds are not present in waste material at the site, and that acid generation potential is less than neutralization potential for all samples. Therefore, generation of acid rock drainage from the waste piles is not a concern at the site.

4.2.5. Sediment Sample Results

Table 10 and Figure 7 summarize the data evaluation for sediment samples. Sediment laboratory data were screened against soil BTVs. Upstream sediment samples from the diversion trench were not collected because the upstream end of the trench is within the impacted area. Soil BTVs were considered appropriate for use because they represent background concentration of metals in soil entering the surface water pathway. Data evaluation results indicated that the following metals were present in sediment samples at concentrations greater than their respective soil BTVs:

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Cobalt
- Copper
- Lead
- Mercury
- Molybdenum
- Nickel
- Selenium
- Silver
- Zinc

The above metals were then screened against their respective human health and ecological screening criteria presented in Section 4.1. The data evaluation results are summarized below.

- Arsenic and mercury concentrations exceeded both human health and ecological screening criteria, thus these metals are considered to be the primary COCs in sediment.
- Antimony, barium, cadmium, copper, lead, selenium, silver, and zinc concentrations exceeded the ecological screening criteria but were less than human health screening criteria.
- Beryllium, cobalt, molybdenum, and nickel concentrations were less than both human health and ecological screening criteria.

Sediment samples collected from the dry diversion trench showed generally higher concentrations of all analytes than downstream sediment samples collected from the flowing tributary to Mammoth Creek. For samples collected in the tributary to Mammoth Creek, only arsenic was detected at concentrations exceeding both background and human health or ecological criteria.

The pH of sediment samples ranged from 5.25 (MM-SD-05) to 6.91 (MM-SD-04) (Table 10).

4.2.6. Surface Water Results

Table 11 and Figure 7 summarize the data evaluation for surface water samples, and Table 4 summarizes the water quality parameters collected during the sampling event. Metals concentrations at the PPE and downstream of the PPE were not appreciably elevated with respect to background. Barium and lead

concentrations slightly exceeded background (i.e., were within 0.006 milligrams per liter of the background concentration), thus they were not considered to be evidence of a release to surface water.

The pH of surface water samples ranged from 6.35 downstream of the PPE (MM-SW-03) to 7.44 at the PPE (MM-SW-02) (Table 4). The Basin Plan states that "pH shall not be depressed below 6.5 nor raised above 8.5," and that, within beneficial use areas, "changes in pH shall not exceed 0.5" (Water Board, 1995). The upstream background pH value at the site is 6.74. At the PPE, the pH value is 0.7 units higher. Below the PPE, the pH is lower than both the background value and the PPE value. The downstream value is 1.1 units lower than at the PPE and 0.39 units lower than the background value.

4.2.7. Leachability Results

The three samples with the highest metals concentrations (MM-S-01, MM-S-04, and MM-S-09) were analyzed for leachability by SPLP. SPLP is a test designed to mimic leaching under natural precipitation conditions expected to be found at the site; as such, it is an appropriate method for evaluating leachability under current site conditions. For comparison purposes, soluble designated levels (SDLs) were calculated for both the human health and ecological criteria for surface water as follows (Central Valley Regional Water Quality Control Board, 1989):

SDL = water quality goal x environmental attenuation factor / concentration factor

Source material at the site is not directly adjacent to flowing surface water nor does the site have any geologic conditions that would facilitate leaching to the environment; therefore, an environmental attenuation factor of 100 was selected for the site (California Regional Water Quality Control Board Central Valley Region, 1989). The concentration factor associated with SPLP analysis is 20 (100 grams of soil are extracted in 2 liters of water).

The following metals were detected in the SPLP samples: antimony, barium, lead, mercury, silver, and zinc. Based on the comparison with the SDLs, lead concentrations exceeded the human heath SDL in two samples, and mercury concentrations exceeded the human health SDL in the one sample. Lead and mercury were detected in all three SPLP samples at concentrations exceeding the ecological SDLs, and silver was detected in one sample at a concentration exceeding the ecological SDL. Table 12 summarizes the leachability comparison results.

Samples MM-S-01, MM-S-04, and MM-S-09 were also analyzed for waste characterization criteria. TCLP was conducted for arsenic, lead, mercury, and silver. Mercury concentrations in leachate from sample MM-S-04 exceeded the maximum contaminant concentration for the toxicity characteristic, which categorizes waste from the site as Resource Conservation and Recovery Act hazardous waste. Table 13 summarizes TCLP results. TCLP was conducted to assist in future site characterization efforts. Although

the waste would be exempt from classification as Resource Conservation and Recovery Act hazardous waste (EPA, 2015d), disposal facilities often still require TCLP analysis for waste management purposes.

4.2.8. Data Quality Assessment

All laboratory results for this PA/SI were deemed usable for their intended purposes. The following laboratory data flags were identified, but do not impact the usability of data:

- Mercury was detected in the method blank on multiple laboratory reports, resulting in a "B" flag on the data. The National Functional Guidelines for Inorganic Superfund Data Review (EPA, 2014) states that for mercury, if the detection in the blank is less than one tenth of the lowest concentration detected in the primary samples, the data are usable and the B flag may be removed. Appendix D presents the original B-flagged mercury data; however, these data are not included in the data summary tables.
- Selenium was also detected in the method blank for several sample batches, resulting in a "B" flag in the laboratory analytical reports and data summary tables. This detection indicates that selenium results are biased high. This high bias indicates that selenium results may in fact be lower than reported; therefore, conclusions based on the data are likely to be more protective. Although selenium was identified as elevated with respect to background and ecological criteria in several samples, selenium was not a risk-driving contaminant and the results are considered usable for their intended purpose.
- For analytes with reporting limits greater than BTVs or screening criteria, results were reported to the minimum detection limit and presented as an estimated or "J" flagged value. These estimated values are deemed acceptable for screening purposes for this investigation.

4.3. STREAMLINED HUMAN HEALTH RISK ASSESSMENT

Because of the proximity of human receptors to the site, ERRG conducted a streamlined HHRA to evaluate the level of risk posed by metals in soil and sediment to human receptors at the site. The level of risk posed by metals in surface water was not evaluated in the streamlined HHRA because a perennial water body is not present at the site that could support water recreational activities (such as swimming and fishing). It is important to note that sediment is present in the surface water pathway and risks from exposure to sediment were evaluated in the streamlined HHRA.

4.3.1. Risk Assessment Methodology

The streamlined HHRA is used to characterize potential risks, which will may be used to develop removal action alternatives to reduce risk by Forest Service. Accordingly, the potential risks to human receptors from exposure to metals were evaluated by calculating risk values (i.e., incremental lifetime cancer risks [ILCR] values and noncancer hazard index [HI] values). To be conservative, the streamlined HHRA evaluated the cumulative effects from all metals. The streamlined HHRA first compared all metals results against the BTVs and then calculated risk-based concentrations (RBCs) for metals that exceeded the BTVs

to evaluate risk to human receptors via specific pathways. The RBCs were calculated based on a target ILCR of 1×10^{-5} and a target HI of 1. Cancer risk is the estimated probability that a person will develop cancer from exposure to site metals, and is generally expressed as an upper-bound probability. For example, the ILCR of 1×10^{-5} represents a risk that, for every 100,000 people, one additional cancer case may occur as a result of exposure to site metals. An HI less than or equal to 1 is considered an acceptable exposure level for noncancer health hazards associated with exposure to site metals.

Potential risks were evaluated for exposure to soil from former mining operations (Mill and Cabins Areas) and sediment in the onsite dry diversion trench and unnamed tributary to Mammoth Creek (Sediment Area). Four exposure areas were considered: the Mill Area, the Cabins Area, Sediment Area, and the entire site. Additionally, the following three exposure pathways were considered when calculating the RBCs: (1) incidental ingestion of metals-impacted soil and sediment, (2) dermal contact with metals-impacted soil and sediment, and (3) inhalation of airborne metals-impacted soil and sediment in outdoor air. Table 2 in Appendix F presents the site-specific exposure parameters for each receptor.

RBCs were calculated for each metal based on the exposure parameters (see Table 2 in Appendix F), the toxicity characteristics of metals present at the site (see Table 3 in Appendix F), and using the following methods and guidance documents:

- "Risk Management Criteria for Metals at BLM Mining Sites," Technical Note 390 Revised (BLM, 2004)
- "Human Health Risk Assessment Note 1: Recommended DTSC [Department of Toxic Substances Control] Default Exposure Factors for Use in Risk Assessment at California Hazardous Waste Sites and Permitted Facilities" (DTSC, 2014)
- Office of Environmental Health Hazard Assessment (OEHHA) Toxicity Criteria Database (OEHHA, 2015)
- "Risk Assessment Guidance for Superfund, Volume I—Human Health Evaluation Manual (Part A) (EPA, 1989)
- EPA RSLs (EPA 2015a)
- Integrated Risk Information System database (EPA, 2015c)

Metals that exceeded the BTVs were then screened against the calculated RBCs to identify the risks posed in soil and sediment at the site. BLM (2004) suggests that exceedances of the RBCs should be interpreted as follows:

- Less than criteria = low risk
- One to 10 times criteria = moderate risk
- Ten to 100 times criteria = high risk
- >100 times the criteria = extremely high risk

Appendix F includes a more detailed discussion of the HHRA process.

4.3.2. Conceptual Site Model

To develop a conceptual understanding of the site, information on potential chemical source, chemical release and transport mechanisms, locations of potentially exposed human and ecological receptors, and potential exposure pathways were assessed. Figure 1 in Appendix F schematically outlines this information in a conceptual site model (CSM). The CSM associates the source of chemicals with potentially exposed human receptors and complete exposure pathways. In this way, the CSM assists in quantifying potential impacts to human health.

Only risks posed by metals in soil and sediment were evaluated in the HHRA. Specifically, soil and waste pile material from former mining operations and sediment in the diversion trench and in the unnamed tributary to Mammoth Creek. The following exposure pathways were evaluated for soil and sediment:

- Incidental ingestion of metals-impacted soil and sediment
- Dermal contact with metals-impacted soil and sediment
- Inhalation of metals-impacted soil and sediment

The surface water and groundwater exposure pathways were not evaluated in the streamlined HHRA for the following reasons. Elevated concentrations of metals were not found in surface water, so surface water is considered an incomplete exposure pathway and was not evaluated further in the streamlined HHRA. (Please note, however, that impacted sediment within the surface water pathway was evaluated.) Results of the leachability analysis indicated that lead, mercury, and silver in soil may leach into groundwater under natural precipitation conditions at concentrations exceeding SDLs. While the groundwater pathway is potentially complete for future land use scenarios, there is currently no mechanism for groundwater to come into contact with either human or ecological receptors. Surface water results do not show elevated metals concentrations, which suggest it is unlikely metals are migrating in the aqueous phase (i.e., being transferred from soil through groundwater to surface water). Additionally, no wells are present at or in close proximity to the site nor are any artesian springs or excavations at the site that might bring groundwater in contact with receptors. Therefore, the groundwater pathway for metals leached from waste is considered incomplete and was not evaluated further in the streamlined HHRA.

The human receptors that were evaluated in the streamlined HHRA for the Mill Area, Cabins Area, Sediment Area, and the entire site are summarized below. Although no full-time residents are present in any areas of the site, the full-time residential receptor was evaluated in the streamlined HHRA as a conservative scenario for comparison purposes.

- Current and future recreational user (child and adult receptors)
- Current and future recreational cabin occupant (child and adult receptors)
- Future construction (trench) worker
- Future full-time resident (child and adult receptors)

4.3.3. Selection of COPCs and Risk Screening

All analytical results for metals were screened against BTVs to identify COPCs in soil and sediment. Essential nutrients (i.e., calcium, iron, magnesium, potassium, and sodium), as identified in EPA guidance (EPA, 1989), were not considered in this HHRA. All metals, except for chromium, thallium, and vanadium, were retained as COPCs at the site. The COPCs were compared with the RBCs to identify the risks posed to human health in each area. Table 14 summarizes the risk evaluation results by site area and receptor. Appendix F provides the complete streamlined HHRA. The risk characterization results are as follows:

- Mill Area, Sediment Area, and Sitewide: Cancer risk is moderate and the noncancer hazard is high for all receptors except the full-time residential receptor, for which cancer risk is high and the noncancer hazard is extremely high
- Cabins Area: Cancer risk and noncancer hazard are moderate for the recreational user and cabin occupant receptors, cancer risk is moderate and the noncancer hazard is high for the construction worker receptor, and the cancer risk and the noncancer hazard are both high for the full-time residential receptor

Of the exposure scenarios and receptors evaluated, the recreational user and recreational cabin occupant receptors were considered to be the most relevant based on the current and future site use. The table below summarizes the risks posed to the likely current and future site users.

	Current and Future Recreational User		Current and Future Recreational Cabin Occupant	
Exposure Area	Cancer Risk	Noncancer Hazard	Cancer Risk	Noncancer Hazard
Mill Area	Moderate	High	Moderate	High
Cabins Area	Moderate	Moderate	Moderate	Moderate
Sediment Area	Moderate	High	Moderate	High
Sitewide	Moderate	High	Moderate	High

Section 5. Analysis of Environmental Pathways

This section provides more detailed information on environmental pathways and preliminary data required to evaluate environmental hazards related to the site in accordance with EPA guidance for conducting PA/SIs (EPA, 1991 1999, and 2013). The information and data will support (1) an analysis of the environmental fate of contaminants found at the site; (2) characterization of site air, soil, groundwater, and surface water; and (3) an assessment of exposure pathways and whether potential risks are posed to human health or the environment based on current and future land use.

5.1. SOIL PATHWAY

The potential receptors that could be exposed to site contaminants via the soil pathway include recreational visitors (both day use and cabin occupants); potential site workers, including Forest Service personnel and their contractors; and wildlife. The public frequently uses the entire site during the summer months; the cabins are typically occupied during the summer months, and visitors regularly access the historic Mill Site. Because the site is regularly occupied, human and ecological receptors are likely to be in direct contact (dermal and ingestion) with soil. Adults are not likely to ingest soil; however, children playing at or near the site may ingest contaminated materials. In addition, soil and dust may be transferred to clothing and vehicles or tracked to other parts of the site or off site. Animals may interact with and ingest contaminated soil. While waste piles are not in direct contact with surface water, a diversion trench connects the piles to an unnamed ephemeral creek that eventually discharges to Mammoth Creek and the Owens River (see Section 4.4). The soil pathway is considered complete because cabin occupants and recreational visitors use contaminated areas of the site.

5.2. AIR PATHWAY

Airborne dust samples for the evaluation of the air pathway were not collected because no dust-generating activities are currently taking place at the site that would impact current site receptors. The Mill Area is only accessible on foot and is mostly covered in a layer of deadfall and vegetation. Under current site use conditions, it is unlikely that soil from the waste piles will be disturbed and become airborne. For current site receptors, the air pathway in the Mill Area is not considered to be of concern. If future activities at the site disturb the waste piles, air monitoring may be required to ensure metals are not being released from soil and waste pile material. The air pathway should be considered a complete pathway during any future construction work at the site.

More soil is exposed within the Cabins Area than in the Mill Area, and the Cabins Area can be accessed by vehicles that may generate dust; therefore, the air pathway is considered complete and of potential concern.

Soil in the Cabins Area has been identified as containing elevated concentrations of metals but no samples of airborne dust were collected for this investigation. The air pathway within the Cabins Area is considered complete, but further data collection would be required to quantify the level of associated risk.

Mercury vapor samples were collected within the Cabins Area. Results for mercury vapor samples collected near the recreational cabins indicate that mercury vapor is not present at concentrations that exceed screening criteria at the ground surface (Appendix C, Table C-3). Thus, mercury vapor is not considered to be of concern as a component of the air pathway.

5.3. GROUNDWATER PATHWAY

The town of Mammoth Lakes and the Mammoth ski resort are both within the 4-mile radius for evaluating the groundwater pathway. Thirty-two groundwater monitoring wells and 9 drinking water wells are located within the 4-mile radius (Figure 3; SWRCB, 2014a and 2014b). None of these wells were in close enough proximity to the site to provide useful information about contaminants from the site, thus no groundwater samples were collected.

ABA results indicated that soil and waste from the site are not acid-producing, and that acidic water is not being generated at the site; therefore, acidic water is not entering the groundwater pathway. However, results of the leachability analysis indicated that lead, mercury, and silver in soil may leach into groundwater under natural precipitation conditions at concentrations exceeding SDLs. If metals leach to the subsurface, they may migrate to surface water via the groundwater pathway. While the groundwater pathway is potentially complete under future land use scenarios, there is currently no mechanism for groundwater to come into contact with either human or ecological receptors. Surface water results do not show elevated metals concentrations, which suggest it is unlikely metals are migrating in the aqueous phase (i.e., being transferred from soil through groundwater to surface water). Additionally, no wells are present at or in close proximity to the site nor are any artesian springs or excavations at the site that might bring groundwater in contact with receptors. As a result, the groundwater pathway for metals leached from waste is not considered complete based on the current and anticipated future land use scenarios.

5.4. SURFACE WATER PATHWAY

As discussed in Section 2.5, an unnamed tributary to the Mammoth Creek flows north along the eastern edge of the site. The Basin Plan established the following beneficial uses of Mammoth Creek and its tributaries (Water Board, 1995):

- Municipal and Domestic Supply
- Agricultural Supply
- Groundwater Recharge
- Freshwater Replenishment

- Water Contact Recreation
- Non-Contact Water Recreation
- Commercial and Sport Fishing
- Cold Freshwater Habitat
- Wildlife Habitat
- Rare, Threatened, or Endangered Species Habitat
- Migration of Aquatic Organisms
- Spawning Reproduction or Early Development

As discussed in Section 4.2.6, metals concentrations in surface water in the unnamed tributary to Mammoth Creek are not elevated with respect to background. As a result, the surface water pathway is considered incomplete.

Sediment within the surface water pathway (i.e., diversion trench and unnamed tributary) contains elevated metals concentrations, indicating metals have been released to sediment that has the potential to migrate downstream to Mammoth Creek. As a result, sediment was evaluated in the streamlined HHRA, as discussed in Section 4.3.

Section 6. Conclusions and Recommendations

This section presents the conclusions of the PA/SI and provides recommendations for further action to address risks to human health and the environment identified during the PA/SI.

6.1. CONCLUSIONS

The streamlined HHRA identified the following risk drivers at the site: arsenic, lead, and mercury (see Section 4.3.3). Additionally, antimony in the Mill Area is considered a COC based on the data evaluation results (see Section 4.2.2). Of the exposure scenarios and receptors evaluated, the recreational user and recreational cabin occupant receptors were considered to be the most relevant based on the current and anticipated future site use. The table below summarizes the risks posed to the likely current and future site users from soil and sediment at the site.

	Current and Future Recreational User		Current and Future Recreational Cabin Occupant	
Exposure Area	Cancer Risk	Noncancer Hazard	Cancer Risk	Noncancer Hazard
Mill Area	Moderate	High	Moderate	High
Cabins Area	Moderate	Moderate	Moderate	Moderate
Sediment Area	Moderate	High	Moderate	High
Sitewide	Moderate	High	Moderate	High

A full wildlife risk evaluation was not conducted for this site; however, sample results were screened against applicable background concentrations and ecological screening criteria. Screening results indicated antimony, arsenic, barium, cadmium, cobalt, copper, lead, mercury, selenium, silver, and zinc are present in site soil and sediment at concentrations that may pose a risk to ecological receptors.

6.2. RECOMMENDATIONS

Based on the results of the PA/SI, further action is recommended to mitigate long-term impacts to human health and the environment from metals in soil and sediment at the site. Further actions should consider removal or mitigation techniques, such as source removal and institutional controls.

Section 7. References

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Figures

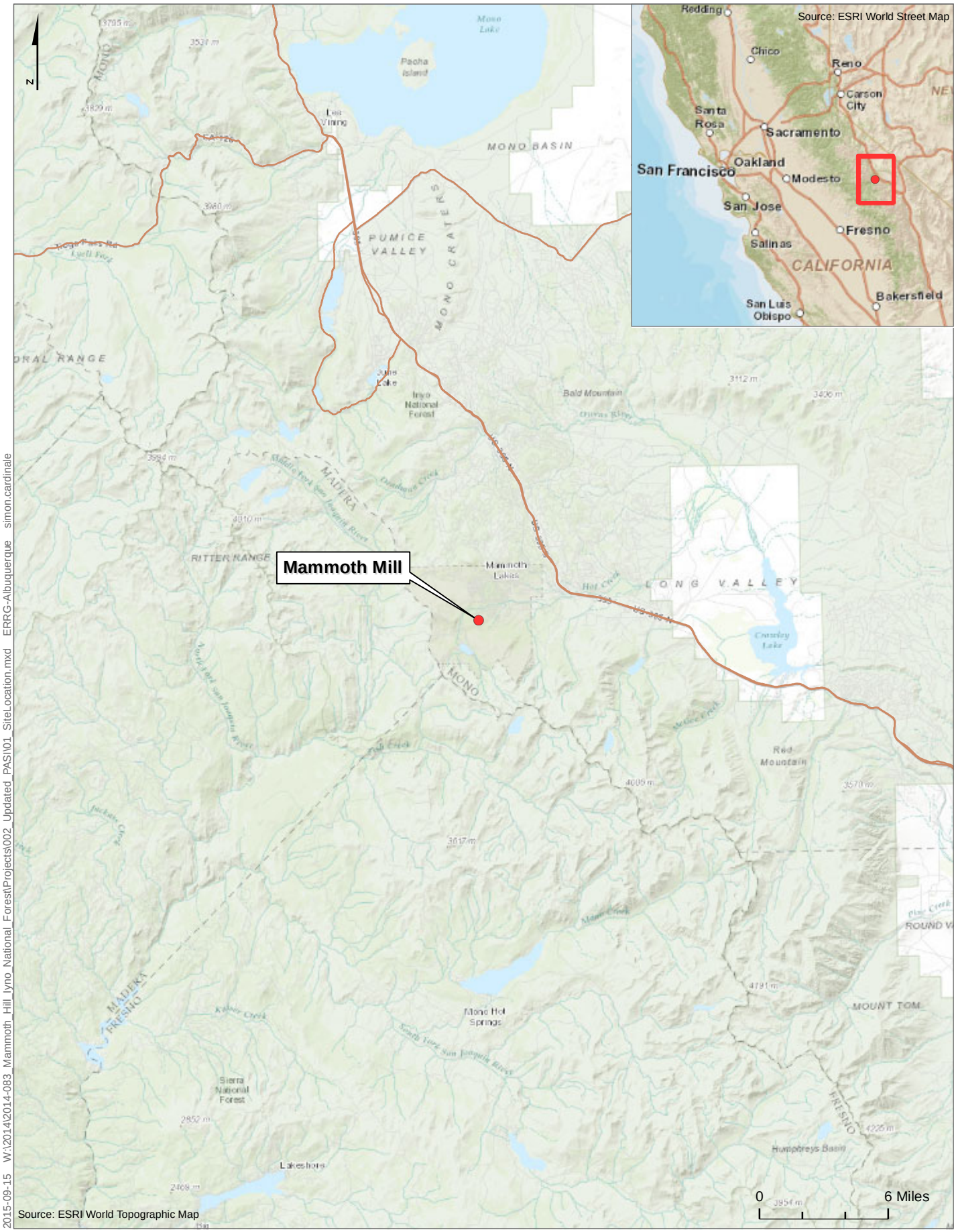

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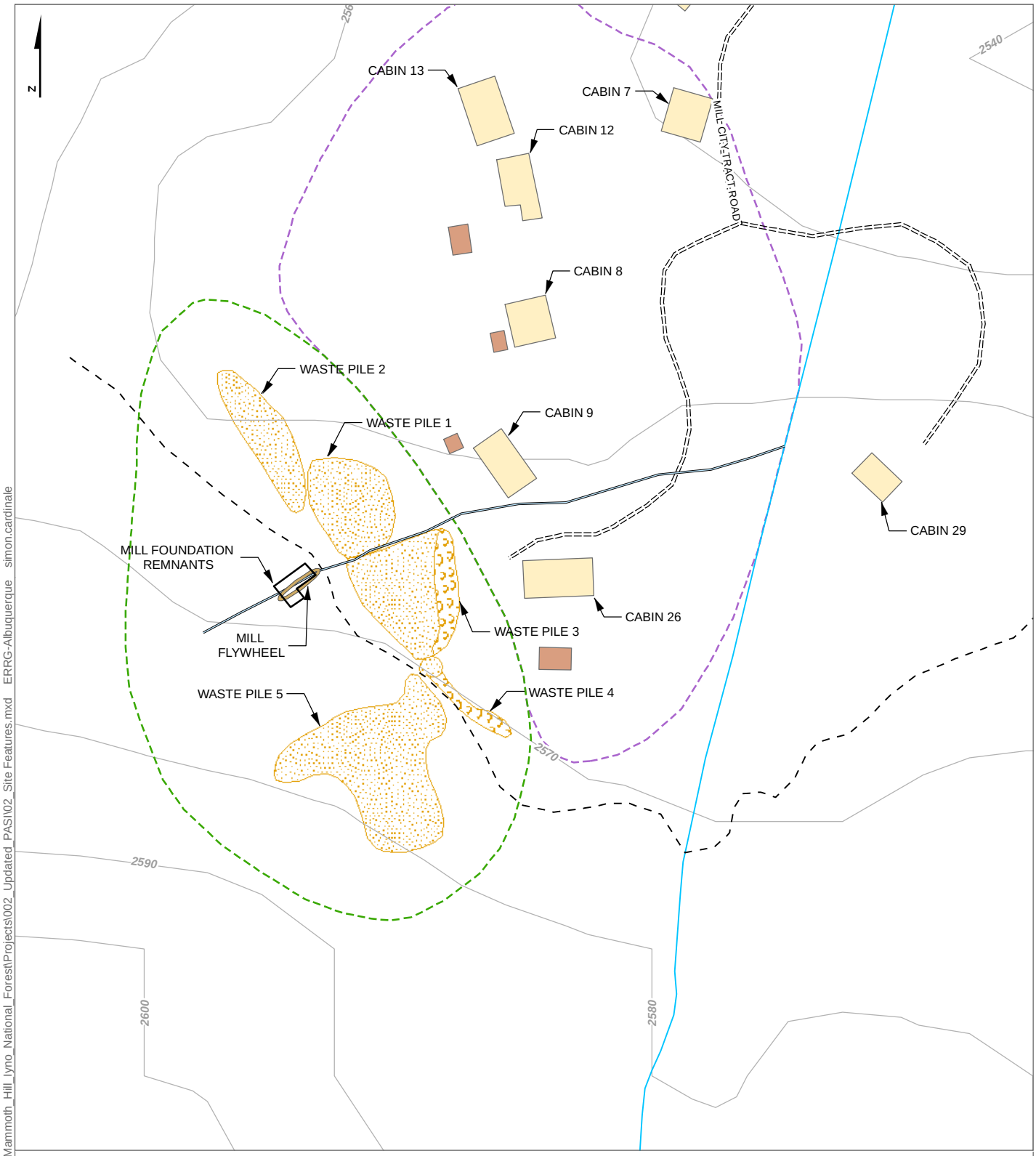
Figure 1. Site Location and Vicinity Map

Mammoth Mill, Inyo National Forest

ERRG



Elevation Contour* (10-meter interval)
Unimproved Road
Mill Diversion Trench
Tributary to Mammoth Creek
Main Trail
Mill Area
Cabin Area
Waste Pile
Cobbles and Boulders
Cabin
Shed

Note:
* Elevation contours are derived from the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) global digital elevation model.

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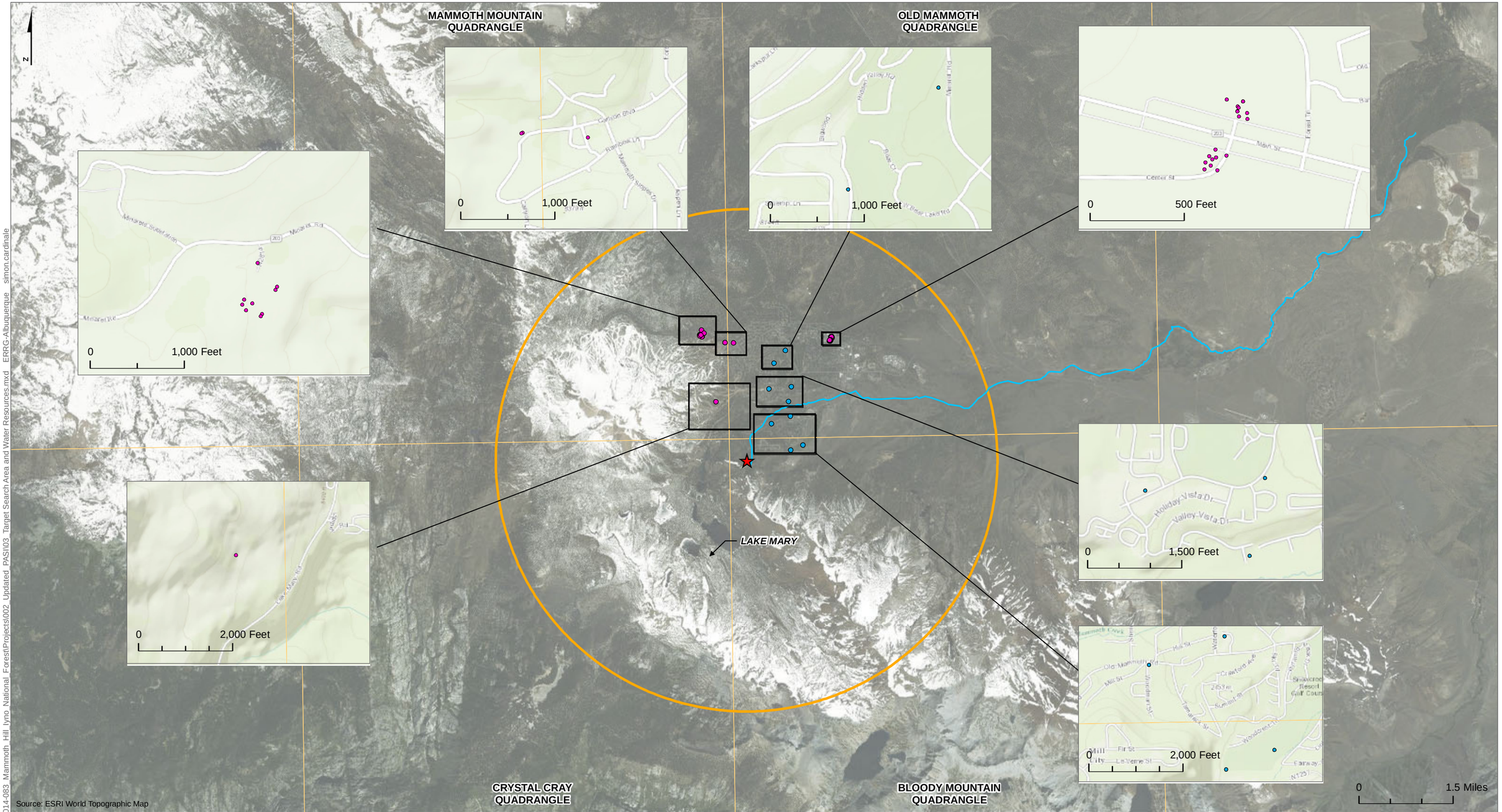
Figure 2. Site Features
Mammoth Mill, Inyo National Forest

ERRG



Site Location

Monitoring Well

Mammoth Community Water District Drinking Water Well [2]

4-Mile Radius from Site Location

USGS 1:24,000 Topographic Quadrangle

Mammoth Creek (15 miles downstream from site location)

Notes:

1. Monitoring well location source: State Water Resources Control Board (SWRCB), 2014a. "Geotracker." accessed on September 18. Available online at: http://geotracker.waterboards.ca.gov.
2. Drinking water wells source: Mammoth Community Water District (MCWD), 2014. Personal communication regarding locations of drinking water wells within a 4 mile radius of the site. From justin Mulbay, Information Systems Manager, MCWD, Mammoth Lakes, Mono County. To Brenna Sheldon, ERRG. September 26.

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Figure 3. Target Search Area and Water Resources

Mammoth Mill, Inyo National Forest

ERRG

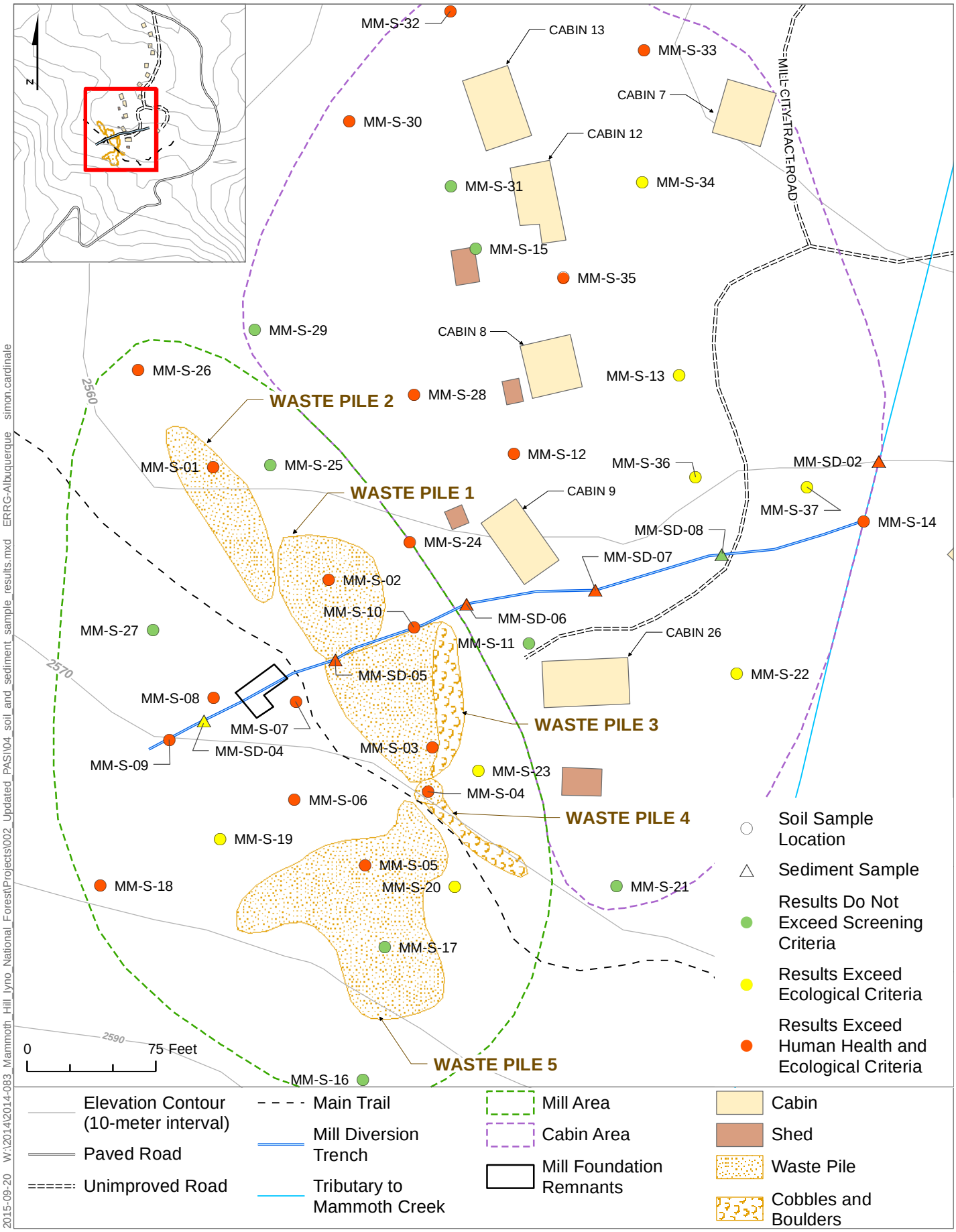

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Figure 4. Soil and Sediment Sample Results

Mammoth Mill, Inyo National Forest

ERRG

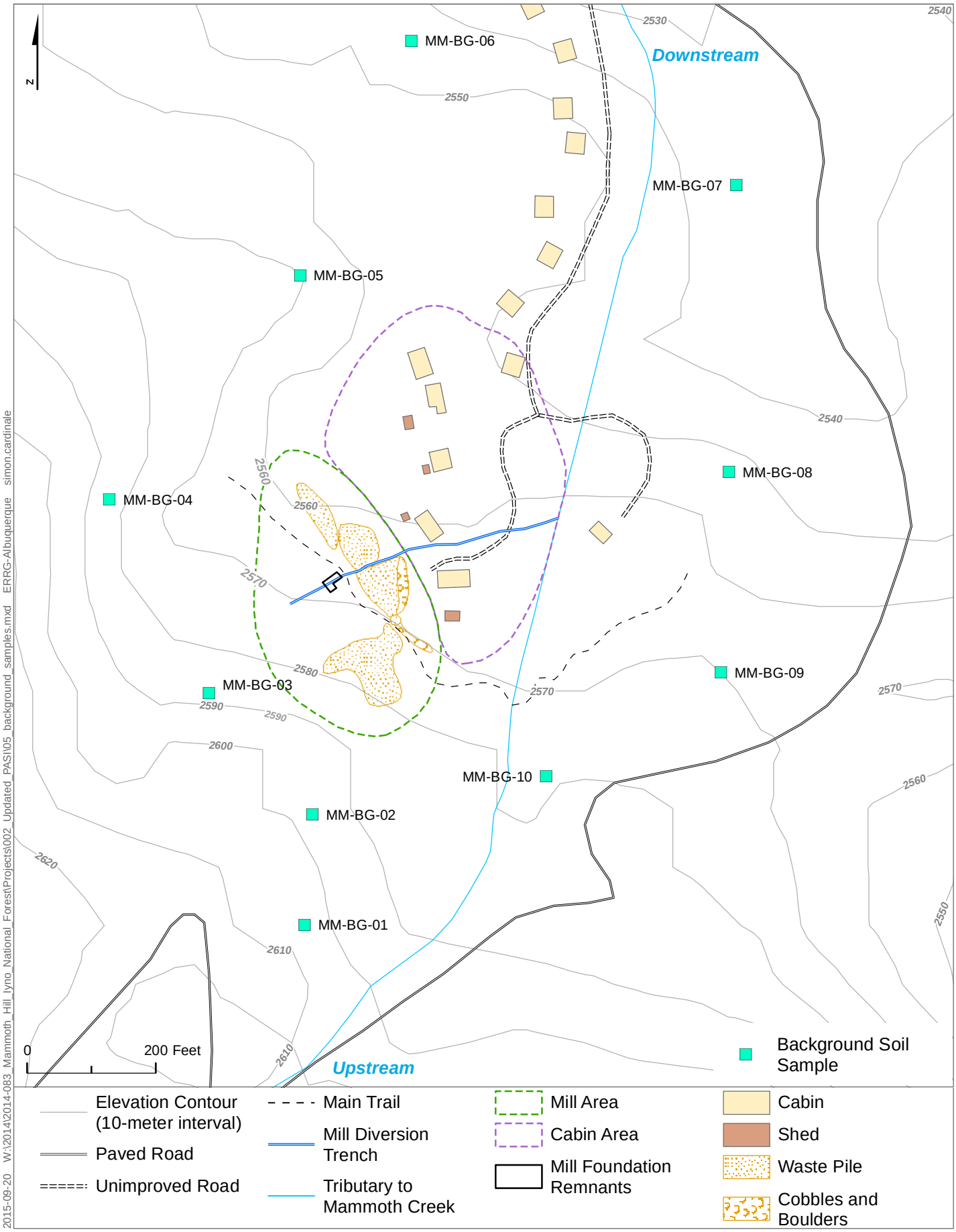

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Figure 5. Background Sample Location

Mammoth Mill, Inyo National Forest

ERRG

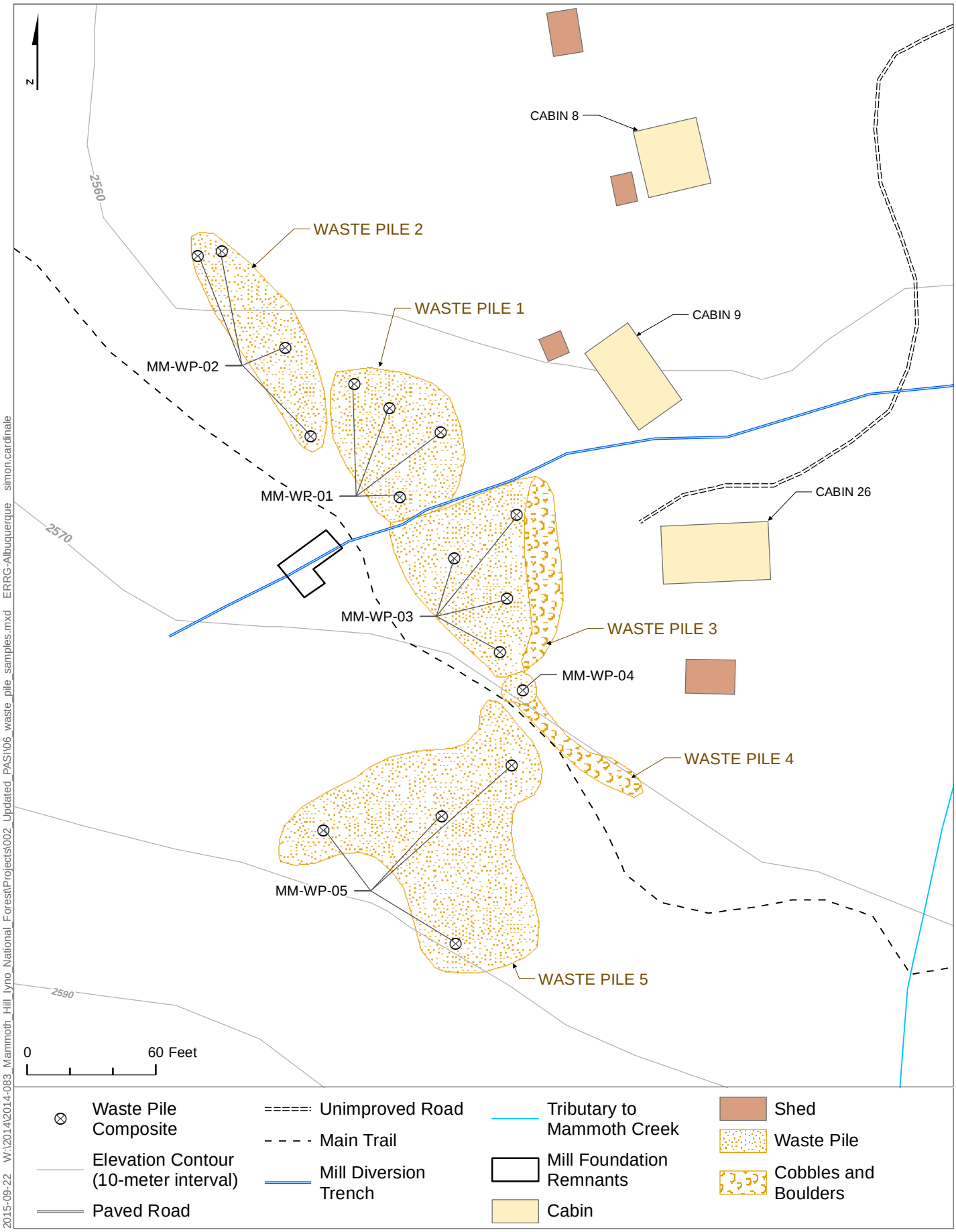

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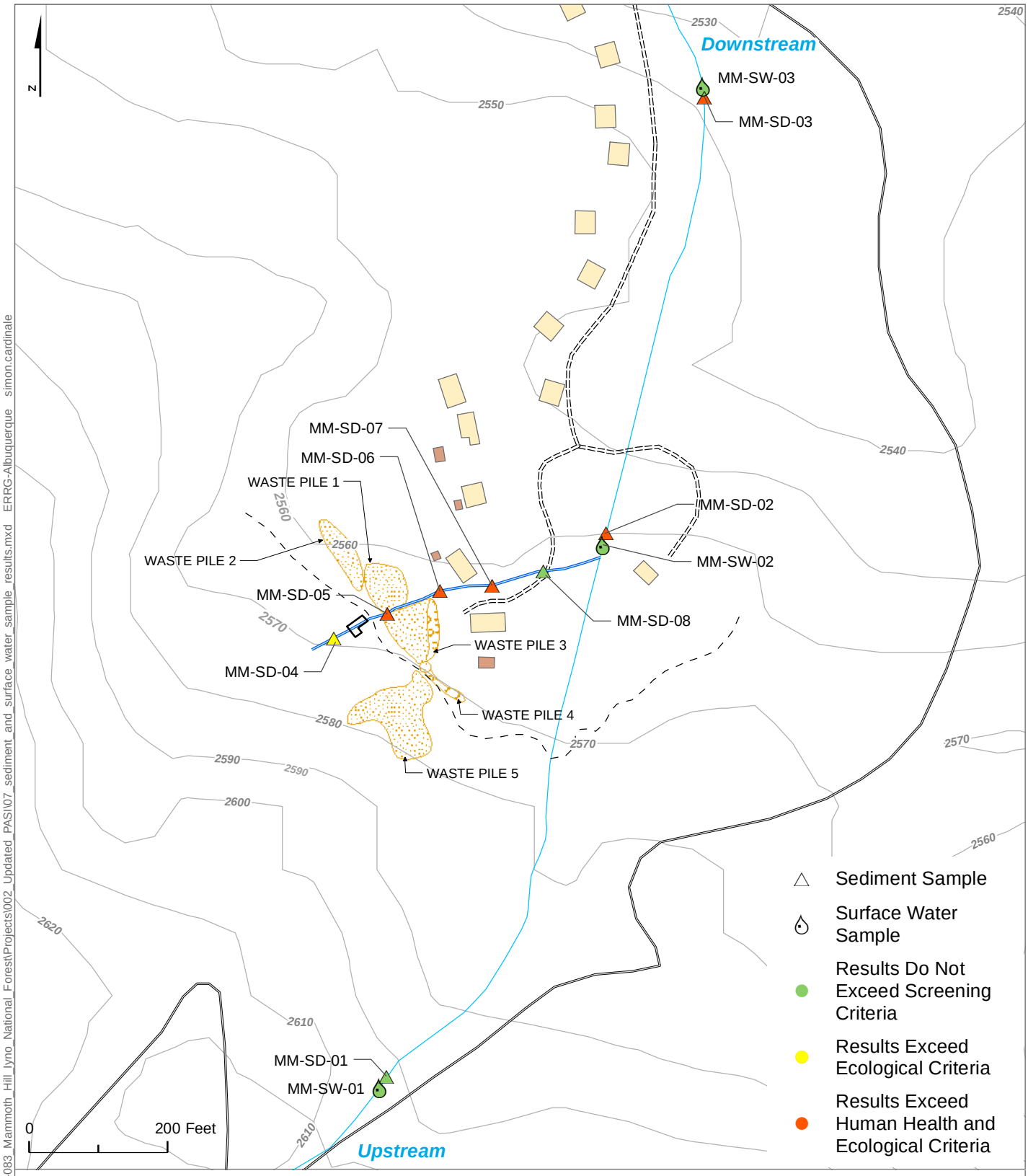
Figure 6. Waste Pile Sample Results

Mammoth Mill, Inyo National Forest

ERRG



Elevation Contour (10-meter interval)
Paved Road
Unimproved Road
Main Trail
Mill Diversion Trench
Tributary to Mammoth Creek
Mill Foundation Remnants
Cabin
Shed
Waste Pile
Cobbles and Boulders

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Figure 7. Sediment and Surface Water Sample Results
Mammoth Mill, Inyo National Forest

ERRG

Tables

Table 1. Sensitive Animal Species

Common Name	Scientific Name	Federal Status	California Status	California Department of Fish and Wildlife Status
Amphibians				
California tiger salamander	*Ambystoma californiense*[a]	Threatened	Threatened	Species of Special Concern
Inyo Mountains slender salamander	*Batrachoseps campb*[b,c]	None	None	Species of Special Concern
Mount Lyell salamander	*Hydromantes platycephalus*[b,d]	None	None	Species of Special Concern
Sierra Nevada yellow-legged frog	*Rana sierrae*[b,c,d]	Proposed Threatened	Threatened	Species of Special Concern
Yosemite toad	*Anaxyrus canorus*[b,c,d]	Proposed Threatened	None	Species of Special Concern
Birds				
Bald Eagle	*Haliaeetus leucocephalus*[a]	Delisted	Endangered	Fully Protected
Black-backed woodpecker	*Picoides arcticus*[a]	None	None	
Brewer's sparrow	*Spizella breweri*[c]	None	None	
Chipping sparrow	*Spizella passerine,*[c,d]	None	None	
Great Gray Owl	*Strix nebulosa*[a,b,c,d]	None	Endangered	
Mount Pinos sooty grouse	*Dendragapus fuliginosus howardi*[c]	None	None	Species of Special Concern
Northern Goshawk	*Accipiter gentilis*[a,b,c,d]	None	None	Species of Special Concern
Olive-sided flycatcher	*Contopus cooperi*[c,d]	None	None	Species of Special Concern
Osprey	*Pandion haliaetus*[b,c]	None	None	Watch List
Prairie Falcon	*Falco mexicanus*[a]	None	None	Watch List
Red-breasted sapsucker	*Sphyrapicus ruber*[c,d]	None	None	
Swainson's hawk	*Buteo swainsoni*[a]	None	Threatened	
Willow flycatcher	*Empidonax traillii*[a]	None	Endangered	
Yellow warbler	*Setophaga petechia*[c,d]	None	None	Species of Special Concern

Table 1. Sensitive Animal Species *(continued)*

Common Name	Scientific Name	Federal Status	California Status	California Department of Fish and Wildlife Status
Mammals				
California wolverine	*Gulo gulo*[b,d]	Proposed Threatened	Threatened	Fully Protected
Fisher	*Pekania pennanti*[c]	Candidate	Candidate Threatened	Species of Special Concern
Gray-headed pika	*Ochotona princeps schisticeps*[a,b,c,d]	None	None	
Long-eared myotis	*Myotis evotis*[d]	None	None	
Long-legged myotis	*Myotis volans*[d]	None	None	
Mount Lyell shrew	*Sorex lyelli*[a,b,c,d,]	None	None	Species of Special Concern
Pacific marten	*Martes caurina*[a,b,c,d]	None	None	
Sierra marten	*Martes caurina sierrae*[a,c,d]	None	None	Species of Special Concern
Sierra Nevada red fox	*Vulpes vulpes necator*[a,c]	None	Threatened	
Silver-haired bat	*Lasionycteris noctivagans*[c,d]	None	None	
Western white-tailed jackrabbit	*Lepus townsendii*[a,b,d]	None	None	Species of Special Concern
Yuma myotis	*Myotis yumanensis*[c,d]	None	None	
Fish				
Lahontan cutthroat trout	*Oncorhynchus clarkii henshawi*[d]	Threatened	None	
Owens sucker	*Catostomus fumeiventris*[a]	None	None	Species of Special Concern
Paiute cutthroat trout	*Oncorhynchus clarkii seleniris*[d]	Threatened	None	
Volcano Creek golden trout	*Oncorhynchus mykiss aguabonita*[b,c]	None	None	Species of Special Concern

Notes: Species list generated from California Natural Diversity Database Quick Viewer for Bloody Mountain, Mammoth Mountain, Crystal Crag and Old Mammoth Quadrants, and is available online at: <http://imaps.dfg.ca.gov/viewers/cnddb_quickviewer/app.asp>.

a=Old Mammoth

b=Bloody Mountain

c=Mammoth Mountain

d=Crystal Crag

Table 2. Sensitive Plant Species

Common Name	Scientific Name	Federal Status	California Status	CNPS Rare Plant Rank
Bolander's bruchia	*Bruchia bolanderi*[a]	None	None	4.2
Canescent draba	*Draba cana*[b]	None	None	2B.3
Clustered-flower cryptantha	*Cryptantha glomeriflora*[a,b,c]	None	None	4.3
Dwarf goldenbush	*Ericameria nana*[a,d]	None	None	4.3
Fell-fields claytonia	*Claytonia megarhiza*[b]	None	None	2B.3
Geyer's sedge	*Carex geyeri*[a]	None	None	4.2
Greene's rockcress	*Arabis repanda var. greenei*[b]	None	None	3.3
Hall's meadow hawksbeard	*Crepis runcinata ssp. Hallii*[d]	None	None	2B.1
Inyo phacelia	*Phacelia inyoensis*[d]	None	None	1B.2
Liddon's sedge	*Carex petasata*[a]	None	None	2B.3
Long Valley milk-vetch	*Astragalus johannis-howellii*[d]	None	None	1B.2
Marsh arrow-grass	*Triglochin palustris*[b]	None	None	2B.3
Mono Lake lupine	*Lupinus duranii*[a,d]	None	None	1B.2
Mono milk-vetch	*Astragalus monoensis*[d]	None	None	1B.2
Mount Dana sedge	*Carex incurviformis*[b]	None	None	4.3
Northern limestone buckwheat	*Eriogonum microthecum var. alpinum*[a]	None	None	4.3
Pine City sedum	*Sedum pinetorum*[c]	None	None	3
Pinzl's rockcress	*Boechera pinzliae*[a]	None	None	1B.3
Robbins' pondweed	*Potamogeton robbinsii*[a,c]	None	None	2B.3
Scribner's wheat grass	*Elymus scribneri*[b]	None	None	2B.3
Seep kobresia	*Kobresia myosuroides*[b]	None	None	2B.3

Table 2. Sensitive Plant Species *(continued)*

Common Name	Scientific Name	Federal Status	California Status	CNPS Rare Plant Rank
Short-fruited willow	*Salix brachycarpa var. brachycarpa*[b]	None	None	2B.3
Short-leaved hulsea	*Hulsea brevifolia*[a,c]	None	None	1B.2
Smooth saltbush	*Atriplex pusilla*[b,d]	None	None	2B.1
Spear-fruited draba	*Draba lonchocarpa*[b]	None	None	2B.3
Subalpine fireweed	*Epilobium howellii*[a,b,c]	None	None	4.3
Sweetwater Mountains draba	*Draba incrassata*[b]	None	None	1B.3
Sweetwater Mountains milk-vetch	*Astragalus kentrophyta var. danaus*[b]	None	None	4.3
Tall draba	*Draba praealta*[b]	None	None	2B.3
Tulare rockcress	*Boechera tularensis*[a,c]	None	None	1B.3
Western single-spiked sedge	*Carex scirpoidea ssp. Pseudoscirpoidea*[b]	None	None	2B.2

Notes: Species list generated from California Natural Diversity Database Quick Viewer for Bloody Mountain, Mammoth Mountain, Crystal Crag, and Old Mammoth Quadrants, and is available Online at: <http://imaps.dfg.ca.gov/viewers/cnddb_quickviewer/app.asp>.

a=Mammoth Mountain

b=Bloody Mountain

c=Crystal Crag

d=Old Mammoth

CNPS = California Native Plant Society

CNPS Categories:

1A= plant presumed extinct in California

1B = plant rare, threatened, or endangered in California and elsewhere

2A = plant presumed extinct in California, but more common elsewhere

2B = plant rare, threatened, or endangered in California, but more common elsewhere

3 = plant about which more information is needed

CNPS Subcategories:

0.1 = seriously threatened in California

0.2 = moderately threatened in California

0.3 = not very threatened in California

Table 3. Groundwater Vicinity Wells

Owner	SWRCB Global ID No.	Well Name	Use	Depth to Water[1] (feet bgs)	Northing	Easting
Chevron #9	T0605100018	MW-1	Monitoring Well	14.75	2062040.66659	7004749.50556
	T0605100018	MW-2	Monitoring Well	0.00	2062023.60376	7004705.97505
	T0605100018	MW-3	Monitoring Well	26.23	2062050.32029	7004696.27240
	T0605100018	MW-3R	Monitoring Well	12.68	2062050.24700	7004696.24464
	T0605100018	MW-5	Monitoring Well	24.55	2062113.41598	7004639.76212
	T0605100018	MW-6	Monitoring Well	27.35	2062102.54635	7004727.76145
	T0605100018	MW-6R	Monitoring Well	24.94	2062102.21396	7004727.47733
	T0605100018	MW-8	Monitoring Well	9.12	2062009.95322	7004750.84760
	T0605100018	MW-9	Monitoring Well	21.36	2062075.89191	7004698.95244
	T0605100018	MW-11	Monitoring Well	23.27	2062069.27028	7004703.78045
Mammoth Mart	T0605100033	MW-1	Monitoring Well	12.14	2061779.01211	7004526.56969
	T0605100033	MW-2	Monitoring Well	12.75	2061761.80877	7004554.61944
	T0605100033	MW-3A	Monitoring Well	13.54	2061795.52513	7004563.21824
	T0605100033	MW-4	Monitoring Well	15.21	2061806.67862	7004583.88397
	T0605100033	MW-5	Monitoring Well	17.60	2061812.05346	7004547.34092
	T0605100033	MW-6	Monitoring Well	11.25	2061847.29596	7004580.23748
	T0605100033	MW-7	Monitoring Well	9.55	2061742.43813	7004521.37642
	T0605100033	MW-8	Monitoring Well	21.91	2061816.67149	7004638.24410
	T0605100033	MW-9	Monitoring Well	14.75	2061737.00655	7004590.09032
	T0605100033	MW-10	Monitoring Well	22.88	2061566.83505	6996420.56639
Mammoth Mountain Garage	T0605100047	MW-1	Monitoring Well	214.65	2062087.47752	6993771.28001
	T0605100047	MW-2	Monitoring Well	261.65	2062369.27582	6993927.19425
	T0605100047	MW-2A	Monitoring Well	236.47	2062402.11022	6993942.36377
	T0605100047	MW-3	Monitoring Well	225.72	2062655.71725	6993734.99929
	T0605100047	MW-4	Monitoring Well	213.29	2062224.01967	6993678.82091
	T0605100047	MW-5	Monitoring Well	212.75	2062152.69202	6993613.30415
	T0605100047	MW-6	Monitoring Well	214.22	2062264.54333	6993593.85830
	T0605100047	MW-7	Monitoring Well	212.95	2062213.25540	6993574.69718
	T0605100047	MW-8A	Monitoring Well	Dry	2061615.47146	6995726.93684
	T0605100047	MW-8B	Monitoring Well	Dry	2061610.15653	6995713.41288
	T0605100047	MW-9	Monitoring Well	397.35	2056644.09545	6994962.09056
	T0605100047	OW-1	Monitoring Well	Inactive	2062112.08707	6993784.49632
MCWD	NA	#1	Production Well	252	2056675.71821	7001071.57913
	NA	#6	Production Well	61	2052997.96768	7002296.85914
	NA	#10	Production Well	54	2052583.27737	7001271.53971
	NA	#15	Production Well	254	2055413.41395	7001236.36249
	NA	#16	Production Well	468	2057715.87923	6999404.14131
	NA	#17	Production Well	371	2060954.92973	7000810.36902
	NA	#18	Production Well	63	2054802.71161	6999629.93766
	NA	#20	Production Well	407	2059876.88557	6999849.88339
	NA	#25	Production Well	321	2057915.66300	7001315.49100

Notes:

Production well data obtained from the MCWD.

Monitoring well data obtained from the SWRCB GeoTracker website.

Coordinates for all wells in the table are within a 4-mile radius of the site.

1. Minimum depth to water

bgs = below ground surface

MCWD = Mammoth Community Water District

NA = not applicable

SWRCB = State Water Resources Control Board

Table 4. Water Quality Data

Parameter	MM-SW-01	MM-SW-02	MM-SW-03
pH[1]	6.74	7.44	6.35
Conductivity[1] (mS/cm)	0.325	0.22	0.187
Turbidity[1] (NTU)	105	82	64
Dissolved Oxygen[1] (mg/L)	13.60	13.55	12.76
Temperature[1] (°C)	10.7	11.8	12.3
Total Hardness[2] (mg/L)	52	51	50

Notes:

1 = parameters collected in the field using a water quality meter

2 = laboratory analysis

mS/cm = milliSiemens per centimeter

mg/L = milligrams per liter

NTU = nephelometric turbidity unit

Table. 5 Background Soil Sample Results

Analyte (mg/kg)	MM-BG-01	MM-BG-02	MM-BG-03	MM-BG-04	MM-BG-05	MM-BG-06	MM-BG-07	MM-BG-08	MM-BG-09	MM-BG-10	BTV[1]
	7/31/2014	6/3/2015	6/3/2015	6/3/2015	6/3/2015	6/3/2015	6/3/2015	6/3/2015	6/3/2015	6/3/2015	
Antimony	0.15 J	0.4 J	0.88	0.37 J	0.12 J F1	ND (0.45)	0.22 J	0.077 J	0.084 J	0.11 J	0.531
Arsenic	3.9	5.6	6.9	4.9	5.1	3.9	9	12	11	25	13.34
Barium	100	83	200	120	80	92	180	240	150	230	281.2
Beryllium	0.050 J	0.11	0.11	0.19	ND (0.096) F1	ND (0.089)	ND (0.082)	ND (0.081)	ND (0.093)	ND (0.076)	0.118
Cadmium	0.11	0.12	0.15	0.13	0.049 J	ND (0.11)	0.1	0.058 J	0.051 J	0.071 J	0.172
Chromium[2]	3.0	5.7	12	6.6	7.3	6.1	6.8	9	3.9	5	12.12
Cobalt	1.9	3.8	7	4.8	3.5	2.5	4.2	5.4	2.9	3.2	7.194
Copper	5.8	6.9	21	10	5.8	3.8	12	9.9	5.4	7.3	13.04
Lead	16	8.6	9.5	9.1	8.9	6.1	39	9.5	6.5	10	11.45
Mercury	0.23	0.17 F1	0.32	0.21	1.4	0.39	0.24	0.62	0.32	3.2	0.418
Molybdenum	0.33 J	0.41	0.34 J	0.47	0.61 F1	0.52	0.5	0.48	0.46	0.52	0.65
Nickel	4.1	12	22	15	11	7.2	19	18	6.1	7.4	25.48
Selenium	ND (0.11)	0.18 J	0.21 J	ND (0.79)	0.73 J B	0.72 J B	0.67 J B	0.75 J B	0.51 J B	0.39 J B	1.08
Silver	0.29	0.056 J	0.32	ND (0.2)	0.18 J F1	0.1 J	0.35	0.33	0.37	0.44	0.534
Thallium	ND (0.36)	ND (0.41)	ND (0.35)	ND (0.39)	ND (0.48)	ND (0.45)	ND (0.41)	ND (0.4)	ND (0.46)	ND (0.38)	--[3]
Vanadium	11	18	38	21	22	23	21	30	21	25	38.56
Zinc	22	35	50	36	23	19	58	32	21	28	60.59

Notes:

1 = Appendix E presents the statistical analysis and BTV calculations.

2 = Samples were analyzed for total chromium.

3 = BTV could not be calculated because all background sample results were ND.

B = compound was found in the blank sample

BTV = background threshold values

F1 = matrix spike and or matrix spike duplicate recovery is outside acceptable limits

J = the result is less than the reporting limit but greater than or equal to the minimum detection limit and the concentration is considered an estimated value

mg/kg = milligrams per kilogram

ND = not detected above reporting limit (shown in parentheses)

Table 6. Data Evaluation Results for Soil in the Mill Area

Sample ID No.	Sample Collection Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium[1] (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	pH
MM-S-01	7/31/2014	**230**	**19**	210	ND (0.12)[2]	**0.62**	8.7	**17**	**190**	**2,500**	**52**	0.83 J	34	**0.8 JB**	**5.4**	ND (1.8)	25	**570**	6.01
MM-S-02	7/31/2014	**4.2**	12	230	0.27	0.15	7.0	5.4	21	**150**	**210**	0.37 J	16	0.17 JB	3.8	ND (0.45)	24	42	6.6
MM-S-03	7/31/2014	**25**	**84**	**1,000**	0.17	**2.4**	5.5	3.7	**130**	**430**	**260**	5.3	11	**6.6 B**	**85**	ND (0.4)	21	**150**	6.37
MM-S-04	7/31/2014	**19**	**36**	**950**	0.21	**1.4**	6.2	4.9	**100**	**380**	**2,200**	2.6	17	**2.7 B**	**64**	ND (0.37)	21	**110**	6.28
MM-S-05	7/31/2014	**0.71**	9.7	150	0.24	0.18	6.2	5.6	12	**18**	2.4	0.34 J	19	ND (0.11)[2]	2.6	ND (0.38)	23	**48**	5.98
MM-S-06	7/31/2014	**23**	**28**	**750**	0.17	**0.97**	6.1	4.9	**58**	**600**	**51**	0.87	15	**1.2 B**	**9.3**	ND (0.38)	19	**160**	5.51
MM-S-07	7/31/2014	**1.0**	11	220	0.2	0.31	9.4	6.0	**95**	**39**	**58**	0.46	21	0.34 JB	2.2	ND (0.42)	29	**55**	5.47
MM-S-08	7/31/2014	**4.0**	15	240	0.12	**0.99**	6.4	5.7	**69**	**220**	**31**	1.5	16	**0.61 JB**	**8.0**	ND (0.45)	22	**120**	5.38
MM-S-09	7/31/2014	**35**	**210**	**1,300**	0.12 J	**1.5**	3.8	1.1	**240**	**750**	**27**	21	2.3	**14 B**	**140**	ND (1.7)	21	**370**	5.90
MM-S-10	7/31/2014	**5.1**	12	250	0.2	**1.0**	7.1	6.1	**59**	**180**	**150**	0.55	21	**0.57 JB**	**6.8**	ND (0.43)	22	**100**	6.23
MM-S-16	6/3/2015	ND (0.059)[2]	6.1	88	0.17	0.11	6.5	4.3	6.7	8.8	0.75	0.45	12	ND (0.11)[2]	0.31	0.20 J	18	29	6.09
MM-S-17	6/3/2015	ND (0.064)[2]	7.4	110	ND (0.025)[2]	0.083 J	7.1	5.8	8.5	5.6	0.55	0.28 J	16	ND (0.12)[2]	0.098 J	0.17 J	26	29	6.16
MM-S-18	6/3/2015	**1.3**	**30**	260	ND (0.03)[2]	0.34	9	7.4	21	**91**	1.8	0.47	28	0.28 J	2.3	0.27 J	24	**75**	5.61
MM-S-19	6/3/2015	**1**	11	290	ND (0.03)[2]	0.28	9.9	8.6	18	**51**	4	0.53	30	0.17 J	3.1	0.29 J	29	**77**	5.91
MM-S-20	6/3/2015	**0.47**	9.6	97	0.031 J	0.11	8	4.3	11	**170**	**9.3**	0.58	9.1	0.25 J	2.7	0.17 J	16	36	5.53
MM-S-23	6/3/2015	ND (0.073)[2]	6.4	84	ND (0.029)[2]	0.2	9.2	3.2	11	9.6	**8.7**	0.55	9.4	0.16 J	0.89	ND (0.44)	20	39	5.89
MM-S-24[8]	6/3/2015	**5.8**	**30**	**720**	0.029 J	**1.3**	5.3	4.1	**42**	**93**	**120**	1.9	9.5	**2.2**	**15**	0.19 J	15	**130**	5.39
MM-S-25	6/3/2015	ND (0.066)[2]	4.4	76	ND (0.026)[2]	0.12	6.9	4.8	6.2	10	3.2	0.37 J	15	0.14 J	0.21	0.24 J	21	34	5.95
MM-S-26	6/3/2015	ND (0.07)[2]	4.5	97	ND (0.028)[2]	0.16	6.9	4.4	9.2	**17**	**14**	0.49	15	0.17 J	0.053 J	0.16 J	20	34	5.96
MM-S-27	6/3/2015	ND (0.057)[2]	5.9	87	ND (0.022)[2]	0.13	8.6	6.1	9.4	7.1	0.61	0.33 J	21	ND (0.1)[2]	0.12 J	0.28 J	28	37	6.17
Maximum Detected Concentration		230	210	1,300	0.31	2.4	9.9	17	240	2,500	2,200	21	34	6.6	140	--	29	570	--
Background Threshold Value		0.531	13.34	281.2	0.118	0.172	12.12	7.194	13.04	11.45	0.418	0.65	25.48	1.08	0.534	--[3]	38.56	60.59	--
Retained as COPC?		Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	--
Human Health Criteria and COC Determination																			
Human Health Criteria[4]		31	0.67	15,000	160	70	--	23	3,100	400	9.4	390	2,700[5]	390	390	--	--	23,000	--
Human Health COC?		Yes	Yes	No	No	No	--	No	No	Yes	Yes	No	No	No	No	--	--	No	--
Risk Interpretation		Moderate	Extremly High	Low	Low	Low	--	Low	Low	Moderate	High	Low	Low	Low	Low	--	--	Low	--
Ecological Criteria and COC Determination																			
Ecological Criteria[6]		0.27	18	330	21	0.36	--	13	28	11	8[7]	--	38	0.52	4.2	--	--	46	--
Ecological COC?		Yes	Yes	Yes	No	Yes	--	Yes	Yes	Yes	Yes	No	No	Yes	Yes	--	--	Yes	--
Risk Interpretation		Extremly High	Extremly High	Moderate	Low	Moderate	--	Moderate	Moderate	Extremly High	High	Low	Low	High	High	--	--	High	--

Notes:

Shaded values exceed the background threshold value.

Red values exceed human health criteria.

Bold values exceed ecological criteria.

1 = Samples were analyzed for total chromium.

2 = Method detection rather than reporting limit was used.

3 = BTV could not be calculated because all background sample results were ND. Detected concentrations in soil and sediment samples were all within a narrow range for both soil (0.17J to 0.29J) and sediment (0.15J to 0.2J). Given the narrow range of estimated values, these estimated detections are attributed to background; therefore, thallium was not retained as a COPC.

4 = EPA RSLs for residential soil, traditional tables (EPA, 2015a).

5 = BLM RMC for the protection of residents (BLM, 2004).

6 = Eco-SSLs (EPA, 2015b).

7 = BLM median wildlife criteria (BLM, 2004).

8 = Sample MM-S-24 was collected on the boundary line between the Mill and Cabins Areas, thus it was included the data sets for both areas.

B = compound was found in the blank sample

BLM = Bureau of Land Management

COPC = chemical of potential concern

COC = chemical of concern

Eco-SSLs = ecological soil screening levels

EPA = U.S. Environmental Protection Agency

J = the result is less than the reporting limit but greater than or equal to the minimum detection limit and the concentration is considered an estimated value

mg/kg = milligrams per kilogram

ND = not detected above reporting limit (shown in parentheses), except were otherwise noted

RMC = risk management criteria

RSLs = regional screening levels

-- = no screening criteria available

Table 7. Data Evaluation Results for Soil in Cabins Area

Sample ID No.	Sample Collection Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium[1] (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	pH
MM-S-11	7/31/2014	**0.28 J**	4.4	160	0.16	0.25	4.7	4.2	8.3	9.9	0.98	0.45 J	9	0.14 JB	0.58	ND (0.47)	13	43	5.25
MM-S-12	7/31/2014	**0.55**	9.1	140	0.19	**0.48**	5.6	4.5	17	**17**	18	0.69	13	0.38 JB	2.7	ND (0.45)	19	**63**	6.14
MM-S-13	7/31/2014	0.19 JB	4.0	100	0.12	0.35	7.4	4.5	9.1	**44**	3.9	0.55 B	8.7	0.17 J	0.43	ND (0.44)	14	**63**	4.89
MM-S-14	7/31/2014	**1.0 B**	26	120	ND (0.069)	**0.39**	6.4	3.8	12	**32**	23	0.42 B	8.5	0.44 J	**7.7**	ND (0.35)	27	46	6.21
MM-S-15	7/31/2014	ND (0.072)[2]	3.3	49	0.11	0.071 J	6.0	4.3	5.2	2.7	0.54	0.30 JB	16	ND (0.13)[2]	0.064 J	ND (0.43)	20	24	5.58
MM-S-21	6/3/2015	ND (0.075)[2]	6.4	87	ND (0.03)[2]	0.086 J	5.2	3.7	6	8.3	0.77	0.52	8.4	ND (0.14)[2]	0.13 J	0.21 J	17	31	5.37
MM-S-22	6/3/2015	ND (0.07)[2]	4.6	74	0.036 J	0.14	4.5	4.2	11	**17**	0.58	0.78	9.4	ND (0.13)[2]	0.19 J	ND (0.42)	12	20	5.83
MM-S-24[7]	6/3/2015	**5.8**	**30**	**720**	0.029 J	**1.3**	5.3	4.1	**42**	**93**	**120**	1.9	9.5	**2.2**	**15**	0.19 J	15	**130**	5.39
MM-S-28	6/3/2015	**5.6**	**25**	**450**	0.039 J	**0.69**	6.2	5.2	**36**	**97**	**42**	2	13	**1.5**	**12**	0.17 J	19	**74**	5.69
MM-S-29	6/3/2015	**0.31 J**	4.6	99	0.18	0.17	6.7	4.8	8.3	**11**	2.1 F1 F2	0.52	14	ND (0.14)[2]	0.36	ND (0.46)	21	33	5.91
MM-S-30	6/3/2015	**5.4**	**39**	**520**	ND (0.027)[2]	1.1	5.3	3.9	**45**	**110**	**120**	1.8	12	**2.4**	**19**	0.23 J	17	**110**	5.49
MM-S-31	6/3/2015	ND (0.071)[2]	3.1	73	ND (0.028)[2]	0.085 J	6.1	4.6	5.1	4.1	0.88 J	0.39 J	13	ND (0.13)[2]	ND (0.21)	0.25 J	21	37	5.64
MM-S-32	6/3/2015	**4.2**	10	**390**	ND (0.022)[2]	**0.39**	6.4	3.9	21	**50**	**140**	0.73	14	**0.59 J**	**6.3**	0.18 J	15	**64**	6.2
MM-S-33	6/3/2015	**1.3**	8.4	200	0.28	0.27	7.1 B	5	15	**49**	**14**	1.8	12	0.21 J	3	ND (0.43)	18	**63**	5.81
MM-S-34	6/3/2015	**0.67**	6.8	94	0.33	0.12	9.1 B	6.9	8.8	8.7	4	0.79	19	ND (0.098)[2]	0.68	ND (0.33)	24	40	5.84
MM-S-35	6/3/2015	**6.6**	**24**	**630**	0.19	**0.78**	6.5 B	3.9	**33**	**98**	**72**	2.1	13	**1.3**	**9.8**	ND (0.49)	20	**79**	5.94
MM-S-36	6/3/2015	**0.57**	4.3	85	0.15	0.15	6.8 B	3.7	8.5	**12**	0.62	0.45	10	ND (0.12)[2]	0.3	ND (0.38)	17	40	5.42
MM-S-37	6/3/2015	**0.98**	6.4	91	0.13	0.15	5.4 B	4.1	17	**240**	2	0.42 J	7.8	ND (0.15)[2]	1.5	ND (0.49)	13	**63**	5.36
Maximum Detected Concentration		5.8	39	720	0.33	1.3	9.1	6.9	45	240	120	2.1	16	2.4	19	--	27	130	--
Background Threshold Value		0.531	13.34	281.2	0.118	0.172	12.12	7.194	13.04	11.45	0.418	0.65	25.48	1.08	0.534	--[3]	38.56	60.59	--
Retained as COPC?		Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	--
Human Health Criteria and COC Determination																			
Human Health Criteria[4]		31	0.67	15,000	160	70	--	--	3,100	400	9.4	390	--	390	390	--	--	23,000	--
Human Health COC?		No	Yes	No	No	No	---	---	No	No	Yes	No	--	No	No	--	--	No	--
Risk Interpretation		Low	Extremly High	Low	Low	Low	--	--	Low	Low	High	Low	--	Low	Low	--	--	Low	--
Ecological Criteria and COC Determination																			
Ecological Criteria[5]		0.27	18	330	21	0.36	--	--	28	11	8[6]	--	--	0.52	4.2	--	--	46	--
Ecological COC?		Yes	Yes	Yes	No	Yes	---	--	Yes	Yes	Yes	No	--	Yes	Yes	--	--	Yes	--
Risk Interpretation		High	Moderate	Moderate	Low	Moderate	--	--	Moderate	High	High	Low	--	Moderate	Moderate	--	--	Moderate	--

Notes:

Shaded values exceed the background threshold value.

Red values exceed human health criteria.

Bold values exceed ecological criteria.

1 = Samples were analyzed for total chromium.

2 = Method detection rather than reporting limit used

3 = BTV could not be calculated because all background sample results were ND. Detected concentrations in soil and sediment samples were all within a narrow range for both soil (0.17J to 0.29J) and sediment (0.15J to 0.2J). Given the narrow range of estimated values, these estimated detections are attributed to background; therefore, thallium was not retained as a COPC.

4 = EPA RSLs for residential soil, traditional tables (EPA, 2015a).

5 = Eco-SSLs (EPA, 2015b).

6 = BLM median wildlife criteria (BLM, 2004).

7 = Sample MM-S-24 was collected on the boundary line between the Mill and Cabins Areas, thus it was included the data sets for both areas.

B = compound was found in the blank sample

BLM = Bureau of Land Management

COPC = chemical of potential concern

COC = chemical of concern

Eco-SSLs = ecological soil screening levels

EPA = U.S. Environmental Protection Agency

F1 = matrix spike and or matrix spike duplicate recovery is outside acceptable limits

F2 = matrix spike/matrix spike duplicate relative percent difference exceeds control limits

J = the result is less than the reporting limit but greater than or equal to the minimum detection limit and the concentration is considered an estimated value

mg/kg = milligrams per kilogram

ND = not detected above reporting limit (shown in parentheses), except were otherwise noted

RSLs = regional screening levels

-- = no screening criteria available

Table 8. Data Evaluation Results for Waste Pile Composite Samples*

Sample ID No.	Sample Collection Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium[1] (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
MM-WP-01	6/3/2015	ND (1.1)	11.1	209	0.58 J	ND (0.21)	12.9	6.8	14	**25.2**	**16.9**	0.060 J	23.2	ND (2.9)	0.31 J	ND (0.67)	28.8 J	45.7
MM-WP-02	6/3/2015	1.4 J	8.8	250	0.56 J	0.22 J	10.9	6.6	21.1	**46.1**	7.0	0.70 J	26.4	ND (2.9)	1.5 J	1.1 J	32.2 J	**73.8**
MM-WP-03	6/3/2015	**7.6**	**47.5**	**1,280**	0.40 J	1.4 J	8.0	7.4	**131**	**345**	**643**	2.9	31.1	4.7 J	**51.2**	ND (0.67)	25.8 J	**186**
MM-WP-04[8]	6/3/2015	**11.2**	**27**	**1,990**	0.43 J	0.63 J	7.3	5.8	**74.4**	**258**	**805**	2.1 J	20.1	5.2 J	**53.2**	ND (0.68)	25.7 J	**111**
MM-WP-05	6/3/2015	ND (1.1)	7.6	177	0.46 J	ND (0.20)	6.8	5.3	10.2	**15.8**	7.0	0.47 J	15.3	ND (2.8)	0.58 J	ND (0.65)	27.1 J	42.1
Maximum Detected Concentration		11.2	47.5	1,990	0.58	1.4	12.9	7.4	131	345	805	2.9	31.1	5.2	53.2	1.1	32.2	186
Background Threshold Value		0.531	13.34	281.2	0.118	0.172	12.12	7.194	13.04	11.45	0.418	0.65	25.48	1.08	0.534	--[3]	38.56	60.59
Retained as COPC?		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Human Health Criteria and COC Determination																		
Human Health Criteria[4]		31	0.67	15,000	160	70	120,000	23	3,100	400	9.4	390	2,700[5]	390	390	--	390	23,000
Human Health COC?		No	Yes	No	No	No	No	No	No	No	Yes	No	No	No	No	--	No	No
Risk Interpretation		Low	High	Low	Low	Low	Low	Low	Low	Low	High	Low	Low	Low	Low	--	Low	Low
Ecological Criteria and COC Determination																		
Ecological Criteria[6]		0.27	18	330	21	0.36	37.3	13	28	11	8[7]	--	38	0.52	4.2	--	7.8	46
Ecological COC?		Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	--	No	Yes	Yes	--	Yes	Yes
Risk Interpretation		High	High	High	Low	Moderate	Low	Low	Moderate	High	High	--	Low	Moderate	High	--	Moderate	Moderate

Notes:

Shaded values exceed the background concentration.

Red values exceed human health criteria.

Bold values exceed ecological criteria.

* = Waste pile sample results were not included in the data set for the streamlined human health risk assessment because analytical results were available for discrete soil samples collected from the waste piles (see Tables 6 and 7).

1 = Samples were analyzed for total chromium. All chromium results were compared with human health and ecological screening criteria for trivalent chromium.

2 = Method detection rather than reporting limit used

3 = BTV could not be calculated because all background sample results were ND. Detected concentrations in soil and sediment samples were all within a narrow range for both soil (0.17J to 0.29J) and sediment (0.15J to 0.2J). Given the narrow range of estimated values, these estimated detections are attributed to background; therefore, thallium is not retained as a COPC.

4 = EPA RSLs for residential soil, traditional tables (EPA, 2015a).

5 = BLM RMC for the protection of residents (BLM, 2004).

6 = Eco-SSLs (EPA, 2015b).

7 = BLM median wildlife criteria (BLM, 2004).

8 = A discrete sample was collected due to the small size of Waste Pile 4.

B = compound was found in the blank sample

BLM = Bureau of Land Management

COPC = chemical of potential concern

COC = chemical of concern

Eco-SSLs = ecological soil screening levels

EPA = U.S. Environmental Protection Agency

J = the result is less than the reporting limit but greater than or equal to the minimum detection limit and the concentration is considered an estimated value

mg/kg = milligrams per kilogram

ND = not detected above the method detection limit (shown in parentheses)

RSLs = regional screening levels

-- = no screening criteria available

Table 9. Acid Base Accounting Results

Total Sulfur (percent)	Acid Potential (tons/1,000)	Neutralization Potential (tons/1,000)	Acid/Base Potential (tons/1,000)
ND (0.050)	ND (4.3)	3.6	-0.7
ND (0.050)	ND (4.3)	9.6	5.3
ND (0.050)	ND (4.3)	1.7	-2.6
ND (0.050)	ND (4.3)	7.2	2.9
ND (0.050)	ND (4.3)	8.0	3.7

Notes:

ND = not detected above reporting limit (shown in parentheses), except were otherwise noted

Table 10. Data Evaluation Results for Sediment

Sample ID No.	Sample Collection Date	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium[1] (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	pH
MM-SD-01 (upstream)	7/31/2014	0.098 J	14	26	ND (0.088)	0.17	1.5	0.91	2.5	4.2	0.95	0.43 J	1.7	0.35 JB	0.38	ND (0.44)	3.6	19	6.42
MM-SD-02 (PPE)	7/31/2014	**0.34 J**	**50**	81	ND (0.091)	0.18	3.4	2.8	5.2	7.2	2.9	0.52	6.3	**0.53 JB**	1.1	ND (0.45)	12	33	6.88
MM-SD-03 (Downstream)	7/31/2014	0.24 J	**36**	38	0.032 J	0.22	2.4	2.2	5.1	7	2.6	0.38	3.7	**0.7 B**	0.66	ND (0.32)	7.5	25	6.61
MM-SD-04	6/3/2015	**0.93 B**	8.7	280	0.12	**1.2**	8.3	7	19	**46**	3.6	0.36	28	0.23 J	**4.6**	ND (0.36)	25	**140**	6.91
MM-SD-05	6/3/2015	**2.4 B**	8.9	210	0.14	0.29	10	7.2	**30**	**130**	**64**	0.4	23	0.29 J	**4.5**	ND (0.4)	27	**59**	5.25
MM-SD-06	6/3/2015	**2.7 B**	16	270	0.19	**0.93**	10	6.9	**78**	**180**	**740**	0.71	24	**0.77 J**	**19**	ND (0.43)	29	**99**	5.86
MM-SD-07	6/3/2015	**6.2 F1**	17	**400**	0.14	**1.4**	6.4	4.7	**85**	**360**	**410**	1.8	12	**2**	**17**	0.15 J	17	**100**	6.05
MM-SD-08	6/3/2015	0.26 J	5.7	86	ND (0.061)	0.24	8	3	7	6.1	0.5	0.39	8.5	ND (0.61)	0.23	0.20 J	23	38	6.01
Maximum Detected Concentration		6.2	50	400	0.19	1.4	10	7.2	85	360	740	1.8	28	2	19	--	29	140	--
Background Threshold Value		0.531	13.34	281.2	0.118	0.172	12.12	7.194	13.04	11.45	0.418	0.65	25.48	1.08	0.534	--[3]	38.56	60.59	--
Retained as COPC?		Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	--
Human Health Criteria and COC Determination																			
Human Health Criteria[3]		31	0.671	15,000[4]	160[4]	70	--	23[4]	3,100	400	9.4	390[4]	2,700	390	390	--	--	23,000	--
Human Health COC?		No	Yes	No	No	No	--	No	No	No	Yes	No	No	No	No	--	--	No	--
Risk Interpretation		Low	Extremly High	Low	Low	Low	--	Low	Low	Low	High	Low	Low	Low	Low	--	--	Low	--
Ecological Criteria and COC Determination																			
Ecological Criteria[5]		0.27	18	330	21	0.36	--	13	28	11	8	--	38	0.52	4.2	--	--	46	--
Ecological COC?		Yes	Yes	Yes	No	Yes	--	No	Yes	Yes	Yes	No	No	Yes	Yes	--	--	Yes	--
Risk Interpretation		High	Moderate	Moderate	Low	Moderate	--	Low	Moderate	High	High	Low	Low	Moderate	Moderate	--	--	Moderate	--

Notes:

Shaded values exceed the background concentration.

Red values exceed human health criteria.

Bold values exceed ecological criteria.

1 = Samples were analyzed for total chromium.

2 = BTV could not be calculated because all background sample results were ND. Detected concentrations in soil and sediment samples were all within a narrow range for both soil (0.17J to 0.29J) and sediment (0.15J to 0.2J). Given the narrow range of estimated values, these estimated detections are attributed to background; therefore, thallium was not retained as a COPC.

3 = EPA RSLs for residential soil, traditional tables (EPA, 2015a).

4 = BLM RMC for the camper (BLM, 2004).

5 = NOAA TELs (NOAA, 2008).

B = compound was found in the blank sample

BLM = Bureau of Land Management

COPC = chemical of potential concern

COC = chemical of concern

EPA = U.S. Environmental Protection Agency

F1 = matrix spike and or matrix spike duplicate recovery is outside acceptable limits

J = the result is less than the reporting limit but greater than or equal to the minimum detection limit and the concentration is considered an estimated value

mg/kg = milligrams per kilogram

ND = not detected above reporting limit (shown in parentheses), except where otherwise noted

NOAA = National Oceanic and Atmospheric Administration

PPE = probable point of entry

RMC = risk management criteria

RSLs = regional screening levels

TELs = threshold effects level

-- = no screening criteria available

Table 11. Data Evaluation Results for Surface Water

Analyte	Human Health Criteria[1]	Ecological Criteria[2, 3]	MM-SW-01 (Upstream/Background) 7/31/2014 Total	MM-SW-01 (Upstream/Background) 7/31/2014 Dissolved	MM-SW-02 (PPE) 7/31/2014 Total	MM-SW-02 (PPE) 7/31/2014 Dissolved	MM-SW-03 (Downstream) 7/31/2014 Total	MM-SW-03 (Downstream) 7/31/2014 Dissolved
Antimony	0.124	--	0.011	0.0065 J	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)
Arsenic	0.093	0.150 [4]	0.041	0.042	0.032	0.029	0.032	0.031
Barium	2[5]	--	0.012	0.052	0.018	0.058	0.018	0.052
Beryllium	0.0043[5]	--	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)
Cadmium	0.155	0.00015 [4,6]	ND (0.0013)[7]	ND (0.00021)[8]	ND (0.0013)[7]	ND (0.00021)[8]	ND (0.0013)[7]	ND (0.00021)[8]
Chromium[9]	0.1[5]	0.042[4,6,10] / 0.011[4,11]	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)
Cobalt	--	--	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)
Copper	11.49	--	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Lead	0.05	0.0012 [4,6]	**0.0087**	**0.0067**	**0.0086**	**0.0076**	**0.0086**	**0.0076**
Mercury	0.093	0.00077 [4]	ND (0.00020)	ND (0.00020)	ND (0.00020)	ND (0.00020)	ND (0.00020)	ND (0.00020)
Molybdenum	--	--	0.0026 J	ND (0.0029)	0.0023 J	ND (0.0029)	ND (0.010)	ND (0.0029)
Nickel	6.194	0.029 [4,6]	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)
Selenium	1.548	0.0050	**0.0076 J**	ND (0.0046)[8]	ND (0.0071)[7]	ND (0.0046)[8]	ND (0.0071)[7]	ND (0.0046)[8]
Silver	1.548	0.00098 [4,6]	ND (0.0012)[7]	ND (0.0020)[7]	ND (0.0012)[7]	ND (0.0020)[7]	ND (0.0012)[7]	ND (0.0020)[7]
Thallium	0.002[5]	--	ND (0.0035)[7]	ND (0.0035)[7]	ND (0.0035)[7]	ND (0.0035)[7]	ND (0.0035)[7]	ND (0.0035)[7]
Vanadium	--	--	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)
Zinc	92.909	0.066 [4,9]	ND (0.020)	0.025	ND (0.020)	0.025	0.010 J	0.018 J
Hardness	--	--	52		51		50	

Notes: All values are in milligrams per liter.

Shaded values exceed the background concentration.

Bold indicates that the result exceeds the ecological criteria.

1 = BLM RMC for the protection of campers (BLM, 2004).

2 = For total metals concentration, unless otherwise noted.

3 = EPA NRWQC (fresh water) (EPA, 2012a).

4 = Dissolved metals concentration.

5 = EPA MCL for drinking water (EPA, 2009).

6 = The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column (EPA, 2012b).

7 = The reporting limit and method detection limit exceed the human health or ecological criterion; therefore, the method detection limit will be used as the criterion for decision-making purposes.

8 = Screening criterion is less than the reporting limit, so the method detection limit was used.

9 = Samples were analyzed for total chromium.

10 = chromium III.

11 = chromium VI.

BLM = Bureau of Land Management

EPA = U.S. Environmental Protection Agency

J = the result is less than the reporting limit but greater than or equal to the minimum detection limit and the concentration is considered an estimated value

MCL = maximum contaminant level

mg/L = milligrams per liter

ND = not detected at concentration greater than reporting limit (shown in parentheses), except were otherwise noted

NRWQC = National Recommended Water Quality Criteria

RMC = risk management criteria

-- = no screening criteria available

Table 12. Synthetic Precipitation Leaching Procedure Results

Analyte	Human Health Screening Criterion[1]	Human Health SDL	Ecological Screening Criterion[2, 3]	Ecological SDL	MM-S-01	MM-S-04	MM-S-09
					7/31/2014	7/31/2014	7/31/2014
Antimony	0.124	0.62	--	--	0.27 B	0.083 JB	ND (0.20)
Arsenic	0.093	0.465	0.150 [4]	0.75	ND (0.20)	ND (0.20)	ND (0.20)
Barium	2	10	--	--	ND (0.20)	0.29	1.1
Beryllium	0.0043	0.0215	--	--	ND (0.010)[5]	ND (0.010)[5]	ND (0.010)[5]
Cadmium	0.155	0.775	0.0015 [4,6]	0.0075	ND (0.020)[7]	ND (0.020)[7]	ND (0.020)[7]
Chromium[8]	0.1	0.5	0.042 [4,6, 9] / 0.011[4,10]	0.055	ND (0.020)[5]	ND (0.020)[5]	ND (0.020)[5]
Cobalt	--	--	--	--	ND (0.20)	ND (0.20)	ND (0.20)
Copper	11.49	57.45	--	--	ND (0.20)	0.048 JB	0.095 JB
Lead	0.05	0.25	0.0012 [4,6]	0.006	**0.26**	**0.14**	**0.29**
Mercury	0.093	0.465	0.00077 [4]	0.00385	**0.011 H**	**0.69 H**	**0.018 H**
Molybdenum	--	--	--	--	ND (0.40)	ND (0.40)	ND (0.40)
Nickel	6.194	30.97	0.029 [4,6]	0.145	ND (0.020)[5]	ND (0.020)[5]	ND (0.020)[5]
Selenium	1.548	7.74	0.0050[4]	0.0252	ND (0.080)[7]	ND (0.080)[7]	ND (0.080)[7]
Silver	1.548	7.74	0.00098 [4,6]	0.0049	ND (0.060)[7]	ND (0.060)[7]	**0.077 J**
Thallium	0.002	0.01	--	--	ND (0.080)[7]	ND (0.080)[7]	ND (0.080)[7]
Vanadium	--	--	--	--	ND (0.20)	ND (0.20)	ND (0.20)
Zinc	92.909	464.545	0.066 [4,6]	0.33	0.11 J B	0.075 JB	0.14 JB

Notes: All values are in milligrams per liter (mg/L).

Bold indicates that the result exceeds the ecolocical soluble designated level.

Red values exceed human health soluble designated level.

1 = BLM RMC for the protection of campers, unless otherwise noted (BLM, 2004).

2 = EPA NRWQC (fresh water) unless otherwise noted (EPA, 2012a).

3 = For total metals concentration, unless otherwise noted.

4 = Dissolved metals concentration.

5 = Screening criterion is less than the reporting limit, so the method detection limit was used instead.

6 = The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. (EPA, 2012b).

7 = The reporting limit and method detection limit exceed thesoluble designated level; therefore, the method detection limit will be used as the criterion for decision-making purposes.

8 = Samples were analyzed for total chromium.

9 = Chromium III.

10 = Chromium VI.

B = compound was found in the blank sample

H = sample was analyzed beyond the specified holding time

J = the result is less than the reporting limit but greater than or equal to the minimum detection limit and the concentration is considered an estimated value

ND = not detected at concentration greater than reporting limit (shown in parentheses), except were otherwise noted

SDL = soluble designated level; (water qaulity goal * 100)/20

-- = not established

Table 13. Toxicity Characteristic Leaching Procedure Results

Analyte (mg/L)	MCCTC	MM-S-01 7/31/2014	MM-S-04 7/31/2014	MM-S-09 7/31/2014
Arsenic	5	ND (0.10)	ND (0.10)	ND (0.10)
Lead	5	3.1	0.21	0.31
Mercury	0.2	ND (0.0020) H	**0.28 H**	0.0042 H
Silver	5	ND (0.050)	ND (0.050)	0.054

Notes:

Bold indicates that the result exceeds the MCCTC

H = sample was analyzed beyond the specified holding time

MCCTC = maximum contaminant concentration for the toxicity characteristic

mg/L = milligrams per liter

ND = not detected at concentration greater than reporting limit (shown in parentheses), except were otherwise noted

Table 14. Human Health Risk Summary

Exposure Area	Current and Future Recreational User Receptor		Current and Future Recreational Cabin Occupant Receptor		Future Construction Worker Receptor		Future Full-Time Residential Receptor	
	ILCR	HI	ILCR	HI	ILCR	HI	ILCR	HI
Mill Area	8E-05	2.3E+01	9E-05	2.7E+01	3E-05	7.2E+01	7E-04	1.9E+02
Cabins Area	3E-05	7.8E+00	3E-05	9.4E+00	1E-05	2.5E+01	2E-04	6.6E+01
Sediment	4E-05	1.4E+01	4E-05	1.7E+01	1E-05	5.0E+01	3E-04	1.1E+02
Sitewide	5E-05	1.7E+01	6E-05	2.0E+01	2E-05	5.4E+01	4E-04	1.4E+02

Notes:

Moderate Risk:	One to 10 times the criteria; ILCR between 1E-05 and 1E-04; HI between 1E+00 and 1E+01
High Risk:	Ten to 100 times the criteria; ILCR between 1E-04 and 1E-03; HI between 1E+01 and 1E+02
Extremely High Risk:	Greater than 100 times the criteria; ILCR between 1E-05and 1E-04; HI between 1E+00 and 1E+01

HI = hazard index

ILCR = incremental lifetime cancer risk

UCL = upper confidence limit

Appendix A. Previous Investigation Results

Table 1. 2013 Soil Sample XRF Results

Sample ID No.	Arsenic (ppm)	Lead (ppm)	Mercury (ppm)
SM 1.0	26.07	107.86	17.58
SM 2.0	36.89	372.37	210.49
SM 3.0	<LOD	189.31	53.48
SM 4.0	23.48	52.48	<LOD
SM 5.0	24.23	95.51	20.42
SM 6.0	20.46	135.81	50.75
SM 7.0	58.52	530.77	40.83
SM 8.0	138.64	1,366.62	173.31
Soil Background 1	*15.09*	*26.82*	*<LOD*
Soil Background 2	*11.09*	*18.33*	*<LOD*
Human RMC	*20*	*1,000*	*40*
Wildlife RMC	*275*	*125*	*8*

Notes:

<LOD = less than the limits of detection

ppm = parts per million

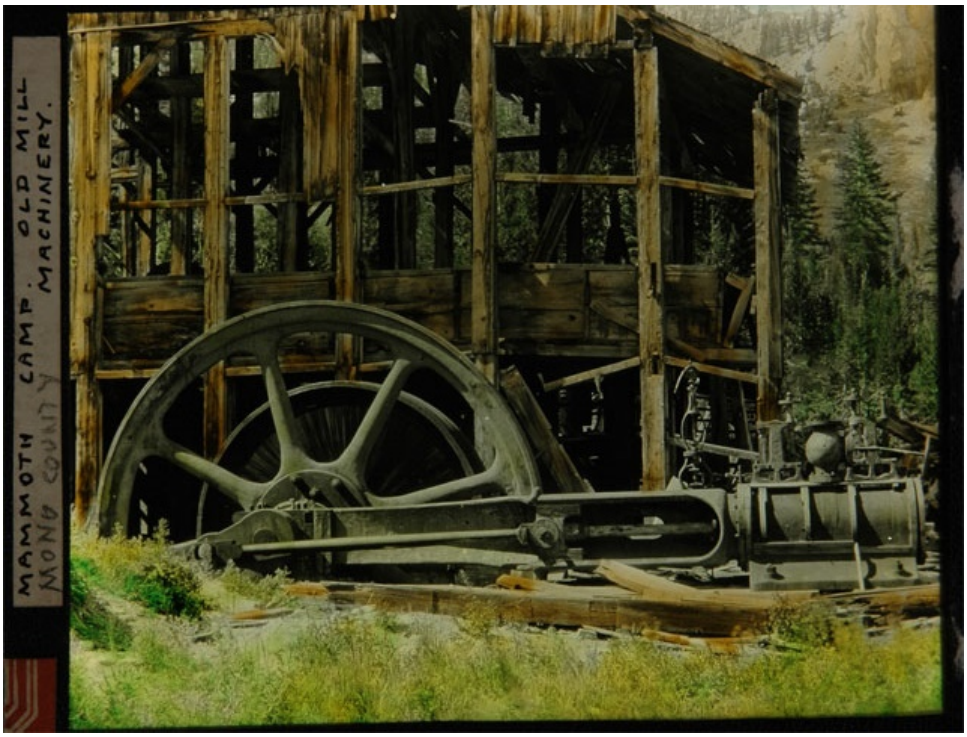
RMC = risk management criteria

XRF = x-ray fluorescence

Source:

U.S. Department of Agriculture Forest Service, 2014. "Removal Preliminary Assessment for the Mammoth Mining Stamp Mill Site, Mammoth RD, Inyo National Forest." January 6.

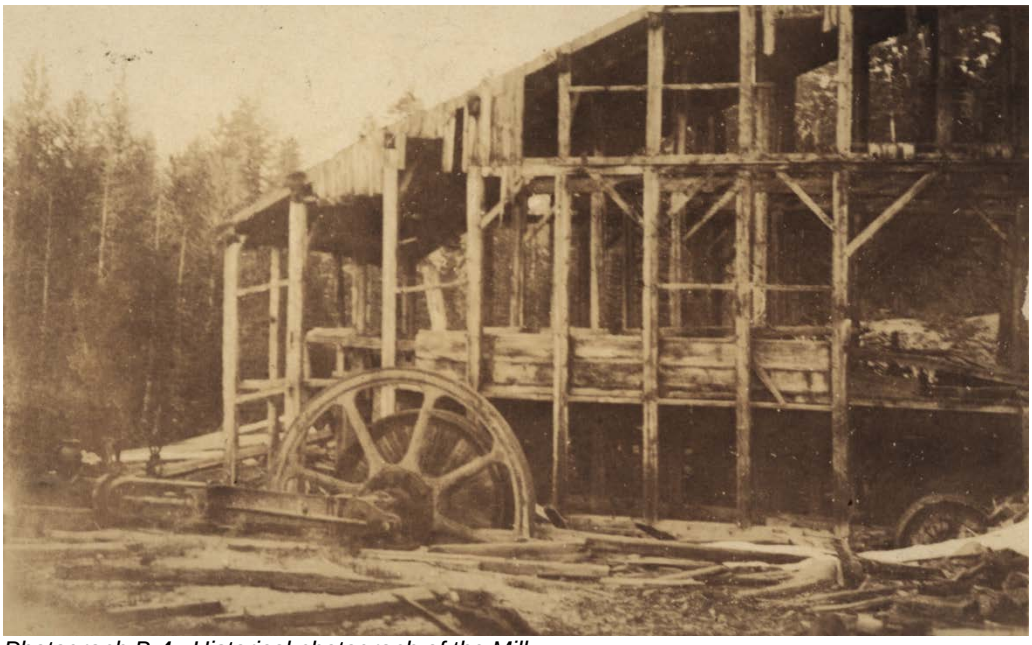
Appendix B. Photographic Log



Photograph B-1: Historical colorized photograph of the mill.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photograph provided by Mark Davis, Mammoth Museum; exact date of photograph and photographer unknown.

Photograph B-2: Historical colorized photograph of the mill.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photograph provided by Mark Davis, Mammoth Museum; exact date of photograph and photographer unknown.

Photograph B-3: Historical photograph of the mill.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photograph provided by Mark Davis, Mammoth Museum; exact date of photograph and photographer unknown.



Photograph B-4: Historical photograph of the Mill.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photograph provided by Mark Davis, Mammoth Museum; exact date of photograph and photographer unknown.

Photograph B-5: Mill flywheel; facing north.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 29, 2014

Photograph B-6: Mill flywheel and foundation remnants; facing southeast.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 29, 2014

Photograph B-7: Mill flywheel and water diversion trough; facing north.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 29, 2014

Photograph B-8: Mill flywheel, showing diversion trough; facing east.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 29, 2014

Photograph B-9: Mill flywheel; facing west.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-10: Remnants of mill wall and foundation, upslope of flywheel; facing west.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 29, 2014

Photograph B-11: Waste Pile 1 (backpack for scale); facing south.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-12: Waste Pile 2, with Waste Pile 1 in the background (notebook for scale); Facing south.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-13: Looking at Waste Pile 2 from Waste Pile 1; facing northeast.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-14: Waste Pile 2 (notebook for scale); facing south.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-15: Rocks at toe of Waste Pile 3 with Cabin 26 and wood pile; facing southeast.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-16: Rocks at toe of Waste Pile 3 and Cabin 9; facing north.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-17: Waste Pile 4 (mostly comprising boulders); facing south.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-18: Waste Pile 4, with Waste Pile 5 and the main trail in the background; facing west.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-19: Standing on Waste Pile 5, showing its side; facing south.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-20: Standing west of the main trail on top of Waste Pile 5, looking toward Cabin 26; facing northwest. Main trail sign is visible at lower right of frame.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-21: Standing on the main trail, looking at Waste Pile 5 from the bottom; facing south.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-22: Looking down diversion trench (center of frame) to cabins from MM-S-10 sample location; facing west.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-23: Looking at Cabin 9 and diversion trench (lower left to right) with mill remnant in the yard; facing northwest from MM-S-11 sample location.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-24: Cabin 20; facing southwest from MM-S-11 sample location.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-25: Cabin 8; facing northeast from MM-S-12 sample location.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-26: Cabin 9; facing west from MM-S-12 sample location.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-27: Cabin 9 with Waste Pile 3 in background; facing west from MM-S-12 sample location.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-28: Cabin 9 with Cabin 8 in background; facing west from MM-S-13 sample location.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-29: Looking toward flywheel (center left) and cabins (far right), standing on top of Waste Pile 5; facing north.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-30: Edge of mill fly wheel with mill diversion trench and mill wall behind; facing west.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-31: Mill fly wheel and diversion trench from mill wall; facing east. XRF sample locations (flags) visible in foreground.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-32: Mill wall and diversion trench, with XRF sample location flag; facing west.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-33: Diversion trench from mill flywheel; facing east. Trench is lined with a thick layer of deadfall and leaves.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-34: Looking toward mill from inside diversion trench south of the site; facing northwest.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-35: Looking toward creek from inside diversion trench, south of the site; facing southwest.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

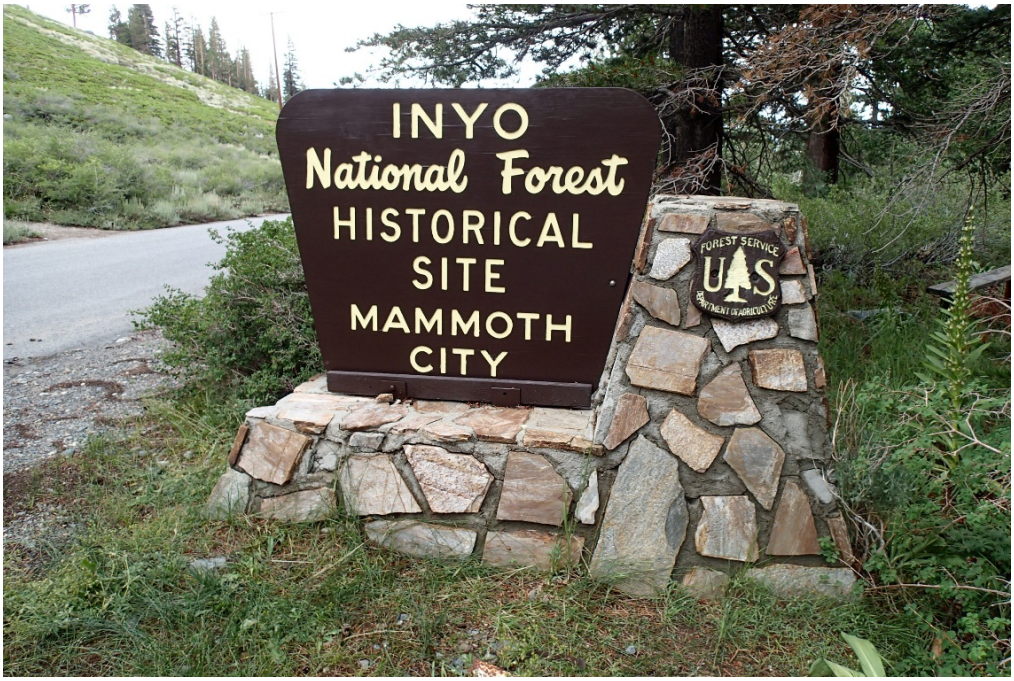
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-36: Looking into diversion trench, standing on top of berm and facing northwest toward mill, south of site.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-37: Looking at main trail from the bottom of Waste Pile 5; facing southeast.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014



Photograph B-38: Mammoth Mine historical site sign; facing east.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 30, 2014

Photograph B-39: Looking down at MM-BG-01 sample location.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-40: Looking at Old Mammoth Road, from MM-BG-01 sample location; facing southwest.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-41: Looking down at sample jar (MM-S-01) in well-vegetated sample location at north end of Waste Pile 2; facing south.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-42: Looking down at MM-S-02 sample location.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-43: Looking down at sample MM-S-03.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-44: Looking down at sample MM-S-04, collected at WP-04, soil is lighter in color and more fine than other soil samples collected.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-45: Looking down at sample MM-S-05.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-46: Looking down at sample MM-S-06.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-47: MM-S-06 sample location with Waste Pile 5 in the background and sample jars at lower half of center frame; facing southwest.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-48: Looking down at sample MM-S-07.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-49: Looking down at sample MM-S-08.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-50: MM-S-08 sample location with XRF flag and mill wall in foreground; facing west.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-51: Looking down at sample MM-S-09.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-52: Looking down at sample MM-S-09.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-53: Mill fly wheel from sample MM-S-10; facing east.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-54: Looking down at sample MM-S-10.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-55: Looking down at sample MM-S-11.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-56: Looking down at sample MM-S-12
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-57: Looking down at sample MM-S-13.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-58: Looking toward creek from MM-S-13 sample location; facing west.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-59: Looking down at sample MM-S-14.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-60: Creek and sample MM-S-14; facing south.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

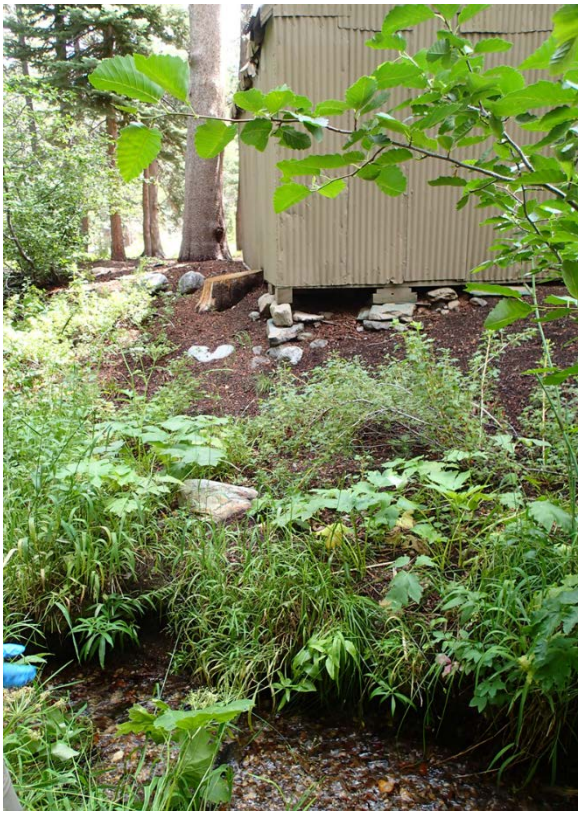
Photograph B-61: Looking down at sample MM-S-15.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-62: Looking down to MM-SW-01 sample location.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-63: Looking down to MM-SW-01 sample location.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-64: Looking down to MM-SW-01 sample location.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-65: Looking down at sample MM-SD-02 in creek.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014



Photograph B-66: Facing north from creek;
MM-SD-02 sample location and cabin 29 in background.
Preliminary Assessment/Site Inspection,
Mammoth Mining Company Stamp Mill Site,
Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-67: In creek upstream from MM-SD-02 sample location; facing west.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-68: In creek downstream from MM-SD-02 sample location; facing east.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-69: Looking down at flag marking XRF sample 15.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-70: Looking down at XRF samples 70 and 71, showing different soil types.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: July 31, 2014

Photograph B-71: Sample MM-SD-04; facing north.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 2, 2015

Photograph B-72: Sample MM-SD-05; facing west.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 2, 2015

Photograph B-73: Sample MM-SD-06; facing west towards mill.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 2, 2015

Photograph B-74: Sample MM-SD-07; facing east towards the road.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 2, 2015

Photograph B-75: Sample MM-SD-08; facing west towards mill.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 2, 2015

Photograph B-76: Sample MM-S-16; facing southwest
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-77: Sample MM-S-17 and edge of Waste Pile 05; facing south.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-78: Sample MM-S-18; facing southwest upslope from cut and mill area.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-79: Sample MM-S-19; facing west.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-80: Possible remnant of mill wall; facing southwest from MM-S-19.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-81: Facing south up to Waste Pile-05.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-82: Looking down at rock pile at Waste Pile-05.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-83: Sample MM-S-20; facing northeast towards Waste Pile-04.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 2, 2015

Photograph B-84: Sample MM-S-21; facing east towards creek.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-85: Sample MM-S-22; facing east towards creek.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-86: Sample MM-S-23; facing east to cabin 26.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-87: *Sample MM-S-23; facing west to Waste Pile-04.*
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-88: Sample MM-S-24; facing east to cabin 9.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-89: Sample MM-S-24; facing west to Waste Pile-01.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-90: Sample MM-S-25; facing northeast to cabins.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-91: Sample MM-S-26; facing northeast to cabins.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-92: Sample MM-S-27; facing west.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-93: Sample MM-S-28; facing east towards cabin 8 and woodpile.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-94: Sample MM-S-28; facing west towards Waste Pile-02 and Waste Pile-01.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-95: Looking down at sample MM-S-29.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-96: Sample MM-S-30; facing west upslope away from site.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-97: Sample MM-S-30; facing east downslope towards cabins.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-98: Sample MM-S-31; facing east towards cabin 13.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-99: Sample MM-S-31; facing west upslope away from site.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-100: Sample MM-S-32; facing east towards cabin.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-101: Sample MM-S-33; facing west towards cabin 13.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-102: Sample MM-S-33, facing east towards cabin 7.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-103: Sample MM-S-34, facing west towards cabin 12.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-104: Sample MM-S-34; facing east towards cabin 7.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-105: Sample MM-S-35; facing west with cabin 8 on the right.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-106: Sample MM-S-35; facing east with cabin 7 in the background.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-107: Sample MM-S-36; facing east towards the creek.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-108: Sample MM-S-36; facing west towards cabin 8.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 2, 2015

Photograph B-109: Sample MM-S-37; facing west towards cabin 9.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-110: Sample MM-S-37; facing east towards creek with cabin 26 (on far side of creek) in the background.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-111: Sample MM-BG-02; facing easts towards creek.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-112: Sample MM-BG-03; facing upslope southeast.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-113: Sample MM-BG-04; facing cross slope north.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-114: Sample MM-BG-05; facing upslope west.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-115: Sample MM-BG-05 with cabins in the background; facing downslope east towards cabins.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-116: Sample MM-BG-06 with water tank in the background; facing north to water tank.

Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California

Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-117: Sample MM-GB-07; facing west towards creek and cabins.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-118: Sample MM-BG-08; facing east to old Mammoth Road.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-119: Sample MM-BG-09; facing south towards old Mammoth Road.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Photograph B-120: Sample MM-BG-10; facing south towards old Mammoth Road.
Preliminary Assessment/Site Inspection, Mammoth Mining Company Stamp Mill Site, Inyo National Forest, Mono County, California
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 3, 2015

Appendix C. Field Screening Results

Table C-1. XRF Results

Date	Reading	Laboratory ID No.	Antimony (ppm)	Arsenic (ppm)	Barium (ppm)	Cadmium (ppm)	Chromium[1] (ppm)	Cobalt (ppm)	Copper (ppm)	Lead (ppm)	Mercury (ppm)	Molybdenum (ppm)	Nickel (ppm)	Selenium (ppm)	Silver (ppm)	Zinc (ppm)	Iron (ppm)	Manganese (ppm)	Rubidium (ppm)	Strontium (ppm)	Tin (ppm)	Titanium (ppm)	Zirconium (ppm)
7/29/2014	#5	--	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
7/30/2014	#4	MM-S-02	<LOD	13	855	<LOD	53	228	28	79	220	13	28	<LOD	<LOD	47	15,708	1,145	74.5	305	<LOD	1,952	225
7/30/2014	#5	--	<LOD	10	725	<LOD	56	136	15	90	27	<LOD	<LOD	<LOD	<LOD	83	12,004	506	76.4	244	<LOD	960	166
7/30/2014	#6	--	<LOD	<LOD	310	<LOD	<LOD	145	<LOD	31.3	<LOD	20	<LOD	<LOD	<LOD	55	10,043	331	69	176.3	<LOD	1,003	132
7/30/2014	#7	--	<LOD	11	661	<LOD	228	122	17	43.6	20.8	<LOD	<LOD	<LOD	<LOD	56	15,531	356	123.9	144.1	<LOD	1,849	416
7/30/2014	#8	--	<LOD	7.6	1,286	<LOD	89	237	21	28.6	9.9	<LOD	38	<LOD	<LOD	50	14,971	595	129.6	150	<LOD	1,467	215
7/30/2014	#10	MM-S-01	110	131	592	<LOD	<LOD	360	151	2,318	31	16	<LOD	<LOD	<LOD	564	13,564	469	107.5	168.5	<LOD	1,631	192
7/30/2014	#12	--	<LOD	59	799	<LOD	56	129	37	393	8.9	13	<LOD	<LOD	<LOD	152	15,556	774	76.2	338	<LOD	1,599	244
7/30/2014	#13	--	<LOD	5.4	536	<LOD	49	176	16	47.2	<LOD	15	<LOD	<LOD	<LOD	71	9,265	333	60.6	319	<LOD	976	234
7/30/2014	#14	--	<LOD	22	885	<LOD	<LOD	134	20	172	208	20	<LOD	<LOD	<LOD	117	16,288	860	81.2	328	<LOD	1,725	216
7/30/2014	#15	--	<LOD	8.9	588	<LOD	53	168	18	112	45	16	<LOD	<LOD	<LOD	77	19,928	676	84.8	541	<LOD	2,477	388
7/30/2014	#16	--	<LOD	15.2	938	<LOD	71	172	19	50	16.2	8	<LOD	<LOD	<LOD	73	39,024	831	79.4	206	129	1,778	163
7/30/2014	#17	--	<LOD	15	811	<LOD	<LOD	149	25	132	173	25	<LOD	<LOD	<LOD	112	18,752	<LOD	63	138	<LOD	<LOD	160
7/30/2014	#18	MM-S-03	87	53	5,051	<LOD	103	152	74	511	341	27	<LOD	7.4	248	112	19,901	490	78.9	436	<LOD	1,921	238
7/30/2014	#19	--	<LOD	13.8	1,215	<LOD	80	196	28	61	69	<LOD	<LOD	<LOD	<LOD	63	14,210	586	75.8	329	<LOD	1,535	278
7/30/2014	#20	MM-S-04	40	79	3,021	<LOD	49	141	166	924	6,400	<LOD	<LOD	<LOD	90	168	19,159	1,174	80.6	319	<LOD	1,862	203
7/30/2014	#21	--	<LOD	6.2	1,090	<LOD	69	217	24	25.1	22.3	<LOD	35	<LOD	15	43	18,072	731	83	362	<LOD	1,812	196
7/30/2014	#22	--	<LOD	6.4	607	<LOD	48	172	24	20.2	10.6	<LOD	<LOD	<LOD	<LOD	105	20,038	668	83	563	<LOD	2,490	242
7/30/2014	#23	MM-S-05	<LOD	13.4	671	<LOD	64	209	27	61	28.3	11	21	<LOD	<LOD	114	18,331	792	79.5	421	<LOD	1,876	207
7/30/2014	#24	--	<LOD	8.3	683	<LOD	67	215	22	50	<LOD	11	<LOD	<LOD	<LOD	89	12,650	248	60.4	119.1	<LOD	<LOD	51.3
7/30/2014	#26	--	<LOD	9.9	1,001	<LOD	49	99	15	22.4	<LOD	8	<LOD	<LOD	<LOD	47	16,891	510	69.1	270	<LOD	1,311	146
7/30/2014	#27	--	<LOD	5.8	1,092	<LOD	91	170	19	29	<LOD	<LOD	<LOD	<LOD	<LOD	60	15,781	489	77.4	539	<LOD	2,053	279
7/30/2014	#28	--	<LOD	7	870	<LOD	66	196	30	30.5	<LOD	9	31	<LOD	<LOD	72	13,241	403	73.5	280	<LOD	1,440	217
7/30/2014	#29	MM-S-06	185	162	1,765	<LOD	<LOD	658	308	1,980	116	32	<LOD	<LOD	26	576	15,281	588	86.4	353	<LOD	1,509	191
7/30/2014	#30	--	<LOD	55	3,395	<LOD	87	265	77	200	182	<LOD	<LOD	4.5	20	194	17,922	396	45	130	<LOD	<LOD	141
7/30/2014	#31	--	<LOD	26	1,674	<LOD	53	167	98	536	497	8	<LOD	3.2	27	222	16,667	490	89	449	<LOD	2,051	266
7/30/2014	#32	--	<LOD	17.1	1,160	<LOD	<LOD	105	<LOD	41	26	10	<LOD	<LOD	<LOD	44	20,781	626	82.5	583	<LOD	2,978	274
7/30/2014	#33	MM-S-07	<LOD	9.9	585	<LOD	42	98	66	46.6	69	13	21	<LOD	<LOD	56	19,106	744	83.4	557	<LOD	2,079	248
7/30/2014	#34	--	<LOD	10	933	<LOD	<LOD	179	24	123	38	<LOD	<LOD	<LOD	<LOD	77	39,390	970	85	305	78	1,748	179
7/30/2014	#35	--	<LOD	5	795	<LOD	61	76	<LOD	30	<LOD	15	<LOD	<LOD	<LOD	51	26,270	1,383	62.6	311	<LOD	1,380	159
7/30/2014	#36	MM-S-09	48	174	4,422	<LOD	103	283	182	582	19.3	24	<LOD	13.8	128	295	14,567	674	82.5	238.5	<LOD	1,991	162
7/30/2014	#37	--	<LOD	7	472	<LOD	49	149	12	151	<LOD	25	<LOD	<LOD	<LOD	152	11,845	305	81.9	130.2	<LOD	2,437	274
7/30/2014	#38	--	<LOD	<LOD	275	<LOD	<LOD	132	11	32.8	<LOD	16	<LOD	<LOD	<LOD	132	15,116	492	86.8	237	<LOD	1,387	192
7/30/2014	#39	--	<LOD	9.8	436	<LOD	49	169	25	49.1	<LOD	20	<LOD	<LOD	<LOD	103	21,442	661	78.1	222	<LOD	1,624	182
7/30/2014	#41	--	<LOD	56	1,676	<LOD	60	200	114	273	38	12	<LOD	4.9	44	316	23,589	447	73.5	101.2	<LOD	433	63.4
7/30/2014	#42	MM-S-08	<LOD	19	800	<LOD	<LOD	136	99	200	48	18	<LOD	<LOD	<LOD	178	15,540	830	72.5	330	<LOD	1,511	146
7/30/2014	#43	--	<LOD	31	1,558	<LOD	59	183	55	127	23.1	13	<LOD	2.1	21	249	10,383	394	98.2	211.1	<LOD	789	200
7/30/2014	#44	--	<LOD	5.5	850	<LOD	<LOD	132	30	63	6.6	21	<LOD	<LOD	<LOD	227	14,253	966	103.5	268	<LOD	1,206	195
7/30/2014	#45	--	<LOD	<LOD	733	<LOD	72	116	18	42	<LOD	14	<LOD	<LOD	<LOD	64	20,045	720	63.7	135.3	<LOD	1,209	154
7/30/2014	#46	--	<LOD	5.8	447	<LOD	<LOD	133	28	106	26.2	25	<LOD	<LOD	<LOD	90	17,417	569	86.7	169.1	<LOD	1,221	175
7/30/2014	#47	--	<LOD	7.8	823	<LOD	70	158	21	61	35	25	<LOD	<LOD	<LOD	83	17,688	877	82.6	132.9	<LOD	1,671	279
7/30/2014	#48	MM-S-10	<LOD	9.2	326	<LOD	<LOD	108	299	139	56	38	<LOD	<LOD	<LOD	471	14,360	633	101.3	247	<LOD	1,293	169
7/30/2014	#49	--	<LOD	10.3	<LOD	<LOD	<LOD	68	392	178	29	42.8	<LOD	<LOD	<LOD	175	13,080	463	80.7	221	<LOD	1,632	219
7/30/2014	#50	--	<LOD	<LOD	<LOD	<LOD	<LOD	70	68	134	58	23	<LOD	<LOD	<LOD	81	17,948	829	86.1	372	<LOD	1,986	262
7/30/2014	#51	--	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	18	42.5	32.4	36.5	<LOD	<LOD	<LOD	54	6,202	989	49	349	<LOD	435	168
7/30/2014	#52	--	<LOD	<LOD	273	<LOD	<LOD	132	17	33.4	<LOD	18	<LOD	<LOD	<LOD	55.2	6,637	394	39.5	164.5	<LOD	362	89
7/30/2014	#53	--	<LOD	<LOD	<LOD	<LOD	<LOD	63	33	58.4	<LOD	51	<LOD	<LOD	<LOD	125	4,045	305	41.9	128.2	<LOD	<LOD	89.5
7/30/2014	#55	--	<LOD	<LOD	<LOD	<LOD	<LOD	68	13	30.4	<LOD	21	<LOD	<LOD	<LOD	50.3	8,940	241	78.1	186	<LOD	620	157

Table C-1. XRF Results *(continued)*

Date	Reading	Laboratory ID No.	Antimony (ppm)	Arsenic (ppm)	Barium (ppm)	Cadmium (ppm)	Chromium[1] (ppm)	Cobalt (ppm)	Copper (ppm)	Lead (ppm)	Mercury (ppm)	Molybdenum (ppm)	Nickel (ppm)	Selenium (ppm)	Silver (ppm)	Zinc (ppm)	Iron (ppm)	Manganese (ppm)	Rubidium (ppm)	Strontium (ppm)	Tin (ppm)	Titanium (ppm)	Zirconium (ppm)
7/30/2014	#56	--	<LOD	6.4	187	<LOD	<LOD	101	19	42.1	8.9	18	<LOD	<LOD	<LOD	62.2	4,709	310	50.3	121.1	<LOD	<LOD	109.4
7/30/2014	#57	MM-S-14	<LOD	27	361	<LOD	<LOD	79	19	71	21.8	17	<LOD	<LOD	<LOD	73	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	113
7/30/2014	#58	--	<LOD	<LOD	<LOD	<LOD	<LOD	33	<LOD	34	<LOD	45.5	<LOD	<LOD	<LOD	33.4	6,951	263	87.6	115.7	<LOD	454	123.9
7/30/2014	#59	MM-S-13	<LOD	135	<LOD	<LOD	<LOD	46	13	1621	27	51	<LOD	<LOD	<LOD	552	7,777	324	91.3	128.9	<LOD	465	177
7/30/2014	#60	--	<LOD	12.4	981	<LOD	79	182	15	35.8	4.9	13	21	<LOD	<LOD	161	4,416	147	49.1	75.6	<LOD	377	92.2
7/30/2014	#63	--	<LOD	4.8	957	<LOD	47	109	27	24.8	12.7	<LOD	34	<LOD	<LOD	97	5,451	269	32.9	140.6	<LOD	<LOD	75.2
7/30/2014	#64	--	<LOD	<LOD	313	<LOD	<LOD	120	13	35.3	14	6.6	18	<LOD	<LOD	59.7	24,957	691	66	394	<LOD	2,307	216
7/30/2014	#65	--	<LOD	<LOD	367	<LOD	<LOD	100	<LOD	20.6	6.8	<LOD	<LOD	<LOD	<LOD	41	15,564	805	136.3	280	<LOD	2,734	142
7/30/2014	#69	--	<LOD	<LOD	506	<LOD	<LOD	<LOD	<LOD	17	<LOD	<LOD	<LOD	<LOD	<LOD	71	18,027	467	121.1	145	<LOD	2,975	495
7/30/2014	#70	--	<LOD	20.4	707	<LOD	<LOD	<LOD	31	62	68	13	<LOD	<LOD	17	72	10,628	527	86	123.2	<LOD	1,275	231
7/30/2014	#71	--	<LOD	4.7	255	<LOD	45	81	10	21.4	<LOD	<LOD	<LOD	<LOD	<LOD	46.1	12,028	450	87.4	110.2	<LOD	1,085	124
7/30/2014	#72	MM-S-15	<LOD	<LOD	548	<LOD	77	68	11	26	<LOD	12	<LOD	<LOD	<LOD	42	11,549	268	103.2	150	<LOD	1,202	209
7/30/2014	#73	--	<LOD	<LOD	252	<LOD	<LOD	75	9	18.5	<LOD	<LOD	<LOD	<LOD	<LOD	34.7	14,130	436	106.6	175.7	<LOD	1,654	186
7/30/2014	#75	--	<LOD	11.4	825	<LOD	49	<LOD	19	37	16	12	<LOD	<LOD	<LOD	99	17,395	633	97	212	<LOD	1,760	175
7/30/2014	#76	--	<LOD	9.6	582	<LOD	58	66	13	62	41	12	<LOD	<LOD	<LOD	100	17,502	592	109.1	182	<LOD	1,834	194
7/30/2014	#77	--	<LOD	14.4	3,131	<LOD	<LOD	<LOD	147	80	70	30	<LOD	<LOD	17	235	12,790	609	87.7	169.9	<LOD	1,049	176
7/30/2014	#78	--	<LOD	10.6	330	<LOD	55	98	12	44.7	7.8	9	20	<LOD	<LOD	159	19,689	820	54	189.8	<LOD	402	126
7/30/2014	#79	--	<LOD	8.8	368	<LOD	43	155	9	26.6	<LOD	14	<LOD	<LOD	<LOD	68	11,031	857	82.7	156.2	<LOD	918	153
7/30/2014	#80	--	<LOD	<LOD	363	<LOD	46	<LOD	<LOD	24.3	<LOD	14	<LOD	<LOD	<LOD	38	12,515	580	110.1	148.5	<LOD	1,314	203
7/30/2014	#81	--	<LOD	<LOD	722	<LOD	<LOD	<LOD	<LOD	25.4	<LOD	9	<LOD	<LOD	<LOD	46	12,777	438	110.9	216	<LOD	1,327	199
7/30/2014	#84	--	<LOD	<LOD	395	<LOD	43	61	<LOD	29	<LOD	11	<LOD	<LOD	<LOD	92	11,819	288	88.7	123.3	<LOD	1,210	152
7/30/2014	#85	--	<LOD	6.1	197	<LOD	<LOD	88	11	34.7	<LOD	<LOD	<LOD	<LOD	<LOD	106	9,575	287	81.3	129.3	<LOD	1,001	149
7/30/2014	#86	--	<LOD	8.3	320	<LOD	47	87	12	68	4.5	8	<LOD	<LOD	<LOD	178	11,630	458	95	139.7	<LOD	1,777	176
7/30/2014	#87	--	<LOD	<LOD	232	<LOD	55	73	14	30.9	<LOD	12	<LOD	<LOD	<LOD	93	12,792	362	87.3	143.2	<LOD	1,351	143
7/30/2014	#89	--	<LOD	10.5	860	<LOD	<LOD	72	59	66	67	14	<LOD	<LOD	<LOD	47	8,987	199	85.9	141	<LOD	903	179
7/30/2014	#90	MM-S-12	<LOD	9	752	<LOD	<LOD	<LOD	20	49	30	19	<LOD	<LOD	<LOD	86	14,662	608	103.8	161.9	<LOD	1,182	167
7/30/2014	#91	--	<LOD	8	440	<LOD	51	111	<LOD	22.5	<LOD	17	<LOD	<LOD	<LOD	56	16,313	686	117.6	176	<LOD	1,680	194
7/30/2014	#92	MM-S-11	<LOD	19.2	504	<LOD	<LOD	105	19	113	14.4	41	<LOD	<LOD	<LOD	167	9,606	603	80.2	245.6	<LOD	591	120
7/30/2014	#93	--	<LOD	11.9	431	18	<LOD	141	19	37.8	<LOD	14	<LOD	<LOD	<LOD	83	13,048	512	110.2	136.9	<LOD	1,067	199
7/30/2014	#94	--	<LOD	<LOD	<LOD	<LOD	<LOD	48	11	25.9	<LOD	23.6	<LOD	<LOD	<LOD	21.9	6,508	440	50.2	158	<LOD	584	96.1
7/30/2014	#95	--	<LOD	<LOD	363	<LOD	<LOD	<LOD	13	61.2	<LOD	49	<LOD	<LOD	<LOD	102	10,713	325	51.1	142	<LOD	935	127
7/30/2014	#96	--	<LOD	10.3	274	<LOD	53	<LOD	11	91	6.6	10	<LOD	<LOD	<LOD	105	11,307	459	101.1	150.6	<LOD	1,290	190
7/30/2014	#97	--	<LOD	<LOD	340	<LOD	<LOD	<LOD	<LOD	23.6	<LOD	18	<LOD	<LOD	<LOD	34	10,736	464	100.7	115.7	<LOD	982	158
7/31/2014	#3	--	<LOD	4.5	563	<LOD	<LOD	66	<LOD	22.3	<LOD	<LOD	<LOD	<LOD	<LOD	102	16,890	509	115	195.2	<LOD	1,812	240
7/31/2014	#4	--	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	21	102	<LOD	35	<LOD	<LOD	<LOD	234	16,164	636	106.1	168	<LOD	2,460	114
7/31/2014	#5	--	<LOD	<LOD	322	<LOD	<LOD	54	<LOD	49.6	<LOD	<LOD	<LOD	<LOD	<LOD	170	9,278	462	91	113.4	223	1,032	144
7/31/2014	#6	--	<LOD	5.8	819	<LOD	88	84	10	30.9	<LOD	<LOD	<LOD	<LOD	<LOD	73	15,459	711	147.7	139.9	<LOD	2,327	221
7/31/2014	#7	--	<LOD	7.1	379	<LOD	35	93	21	37	<LOD	<LOD	<LOD	<LOD	<LOD	102	11,407	515	110.3	128.3	<LOD	2,105	186
7/31/2014	#8	--	<LOD	6.8	697	<LOD	51	<LOD	<LOD	20.4	<LOD	<LOD	<LOD	<LOD	<LOD	50	9,414	306	89.5	87.2	<LOD	1,462	154
7/31/2014	#9	--	<LOD	8.5	500	<LOD	90	69	24	90	<LOD	8	<LOD	<LOD	14	357	8,028	324	115.3	151	<LOD	2,059	208
7/31/2014	#10	--	<LOD	16	505	<LOD	50	82	262	155	9.6	8	<LOD	<LOD	<LOD	198	12,783	348	90	202	<LOD	1,970	158
7/31/2014	#11	--	<LOD	9.4	447	<LOD	<LOD	59	12	42.9	4.6	9	<LOD	<LOD	<LOD	181	10,252	500	56.9	100.8	<LOD	744	145
7/31/2014	#12	--	<LOD	7.9	409	<LOD	56	70	17	40.2	<LOD	8	<LOD	<LOD	<LOD	92	10,004	556	78.3	134.6	<LOD	1,590	247
7/31/2014	#13	--	<LOD	5.6	363	<LOD	<LOD	61	<LOD	26.7	<LOD	<LOD	<LOD	<LOD	<LOD	140	19,104	502	125.6	189.7	<LOD	1,359	170
7/31/2014	#14	--	<LOD	8.5	497	<LOD	<LOD	<LOD	13	33	<LOD	<LOD	<LOD	<LOD	<LOD	63	14,361	768	79.6	141.5	<LOD	670	136
7/31/2014	#15	--	<LOD	5.1	313	<LOD	<LOD	70	<LOD	26	<LOD	6	<LOD	<LOD	<LOD	25.5	15,248	522	94.2	168	<LOD	1,089	173
	Average Background		<LOD	13.09	100[2]	<LOD	3[2]	<LOD	<LOD	22.58	<LOD	<LOD	32.49	<LOD	0.29[2]	54.655	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3 X Background		<LOD	39.27	300[2]	<LOD	9[2]	<LOD	<LOD	67.73	<LOD	<LOD	97.47	<LOD	0.87[2]	163.97	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Human Health Criteria[3]		31	0.67	15,000	70	120,000/0.3	23	3,100	400	9.4	390	2,700[4]	390	390	23,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Ecological Criteria[5]		0.27	18	330	0.36	26/130	13	28	11	8[o]	N/A	38	0.52	4.2	46	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table C-1. XRF Results *(continued)*

Notes:

Shaded values exceed the background concentration.

Red values exceed human health criteria.

Bold values exceed ecological criteria.

1 = Samples were analyzed for total chromium.

2 = No XRF background data available; laboratory background result used for screening

3 = EPA RSLs for residential soil (EPA, 2014a)

4 = BLM RMC for the protection of residents (BLM, 2004)

5 = Eco-SSLs (EPA, 2014b)

6 = BLM median wildlife criteria (BLM, 2004)

BLM = Bureau of Land Management

Eco-SSL = ecological soil screening level

EPA = U.S. Environmental Protection Agency

ID = identification

N/A = not available

ppm = parts per million

RMC = risk management criteria

RSLs = regional screening levels

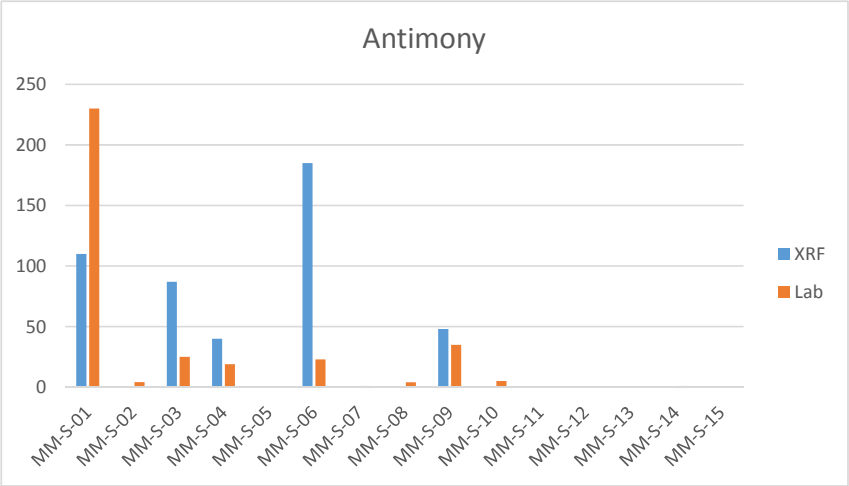
XRF = x-ray fluorescence device

-- = no corresponding lab sample

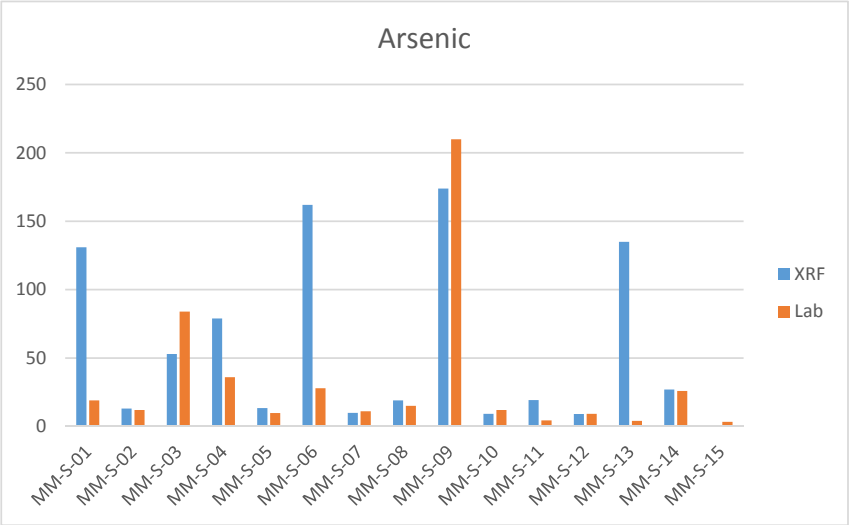
<LOD = less than limit of detection

Table C-2. XRF vs Laboratory Results Comparison

Antimony	XRF	Lab
MM-S-01	110	230
MM-S-02	0	4.2
MM-S-03	87	25
MM-S-04	40	19
MM-S-05	0	0.71
MM-S-06	185	23
MM-S-07	0	1.0
MM-S-08	0	4.0
MM-S-09	48	35
MM-S-10	0	5.1
MM-S-11	0	0.28
MM-S-12	0	0.55
MM-S-13	0	0.19
MM-S-14	0	1.0
MM-S-15	0	0.036



Arsenic	XRF	Lab
MM-S-01	131	19
MM-S-02	13	12
MM-S-03	53	84
MM-S-04	79	36
MM-S-05	13.4	9.7
MM-S-06	162	28
MM-S-07	9.9	11
MM-S-08	19	15
MM-S-09	174	210
MM-S-10	9.2	12
MM-S-11	19.2	4.4
MM-S-12	9	9.1
MM-S-13	135	4.0
MM-S-14	27	26
MM-S-15	0	3.3



Barium	XRF	Lab
MM-S-01	592	210
MM-S-02	855	230
MM-S-03	5,051	1,000
MM-S-04	3,021	950
MM-S-05	671	150
MM-S-06	1,765	750
MM-S-07	585	220
MM-S-08	800	240
MM-S-09	4,422	1,300
MM-S-10	326	250
MM-S-11	504	160
MM-S-12	752	140
MM-S-13	0	100
MM-S-14	361	120
MM-S-15	548	49

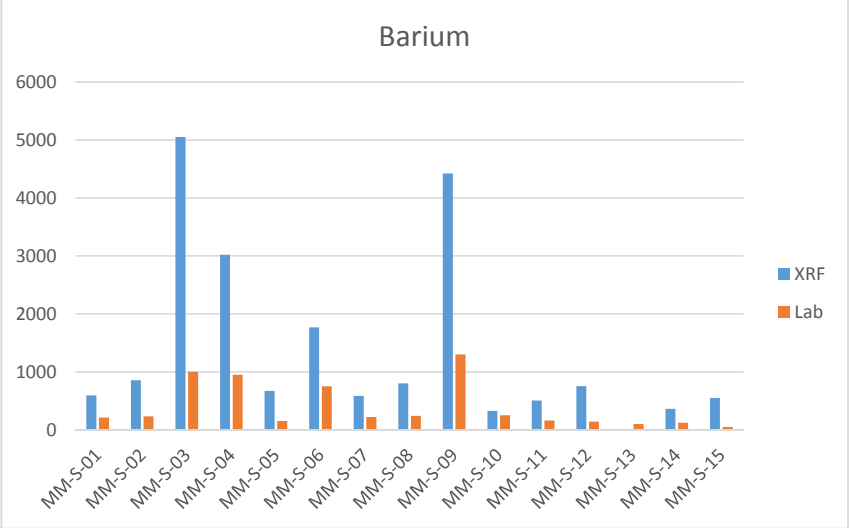
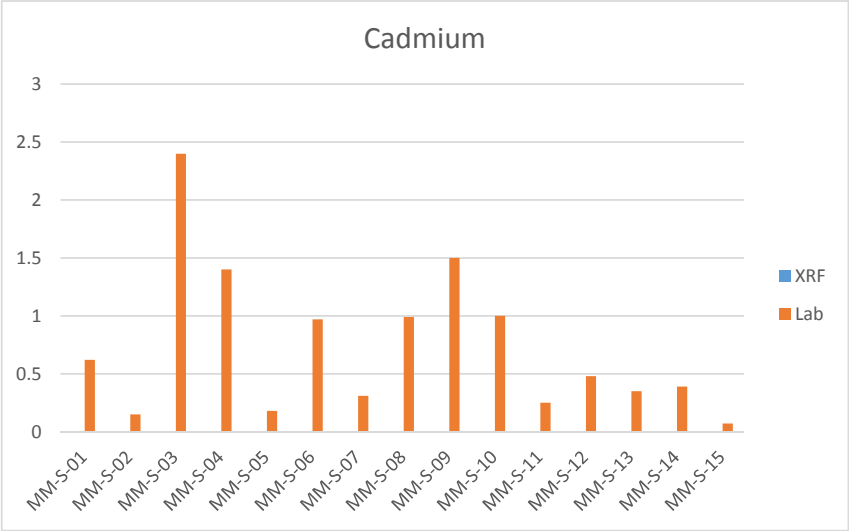
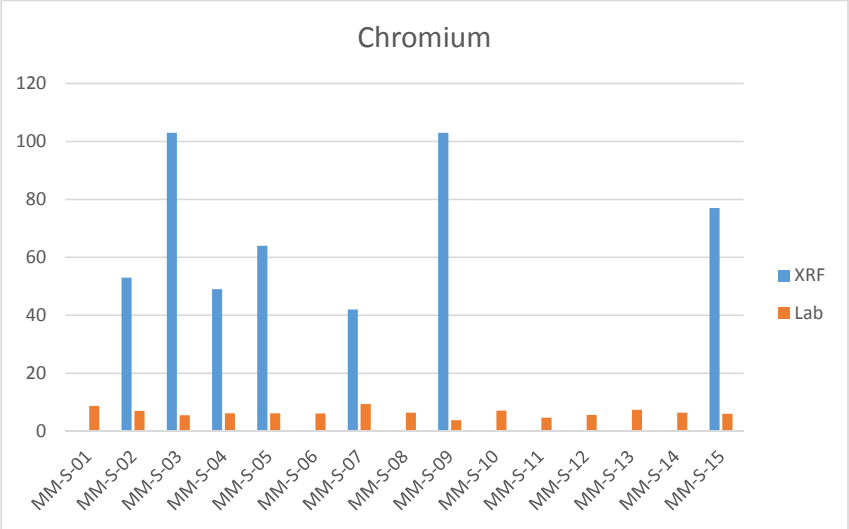


Table C-2. XRF vs Laboratory Results Comparison *(continued)*

Cadmium	XRF	Lab
MM-S-01	0	**0.62**
MM-S-02	0	0.15
MM-S-03	0	**2.4**
MM-S-04	0	**1.4**
MM-S-05	0	0.18
MM-S-06	0	**0.97**
MM-S-07	0	0.31
MM-S-08	0	**0.99**
MM-S-09	0	**1.5**
MM-S-10	0	**1.0**
MM-S-11	0	0.25
MM-S-12	0	**0.48**
MM-S-13	0	0.35
MM-S-14	0	**0.39**
MM-S-15	0	0.071



Chromium	XRF	Lab
MM-S-01	0	8.7
MM-S-02	**53**	7.0
MM-S-03	**103**	5.5
MM-S-04	**49**	6.2
MM-S-05	**64**	6.2
MM-S-06	0	6.1
MM-S-07	**42**	9.4
MM-S-08	0	6.4
MM-S-09	**103**	3.8
MM-S-10	0	7.1
MM-S-11	0	4.7
MM-S-12	0	5.6
MM-S-13	0	7.4
MM-S-14	0	6.4
MM-S-15	**77**	6.0



Cobalt	XRF	Lab
MM-S-01	**360**	**17**
MM-S-02	**228**	5.4
MM-S-03	**152**	3.7
MM-S-04	**141**	4.9
MM-S-05	**209**	5.6
MM-S-06	**658**	4.9
MM-S-07	**98**	6.0
MM-S-08	**136**	5.7
MM-S-09	**283**	1.1
MM-S-10	**108**	6.1
MM-S-11	**105**	4.2
MM-S-12	0	4.5
MM-S-13	**46**	4.5
MM-S-14	**79**	3.8
MM-S-15	**68**	4.3

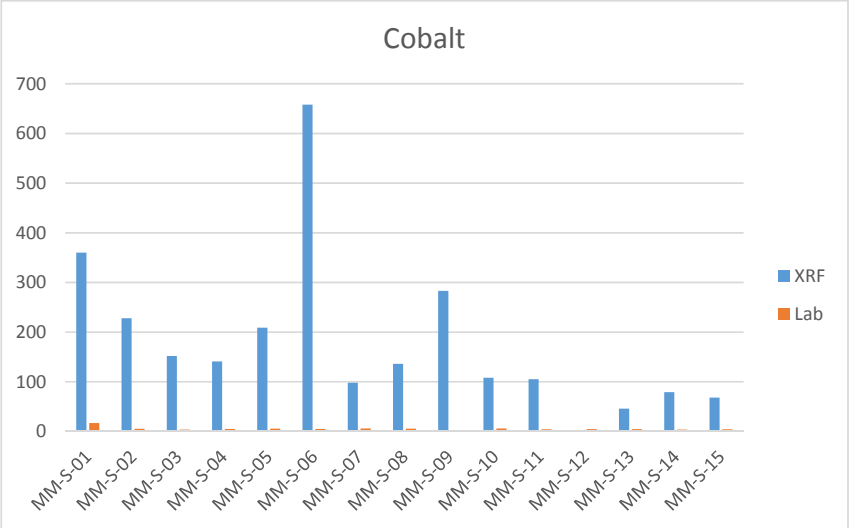
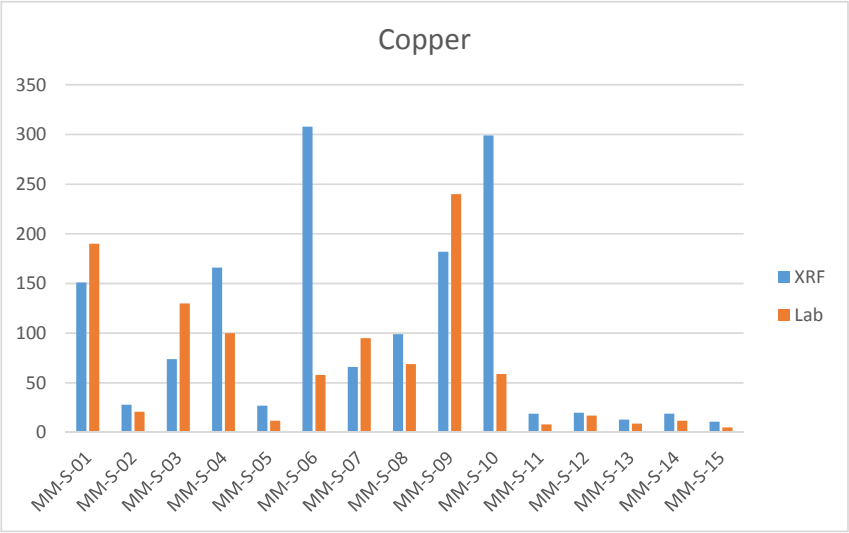
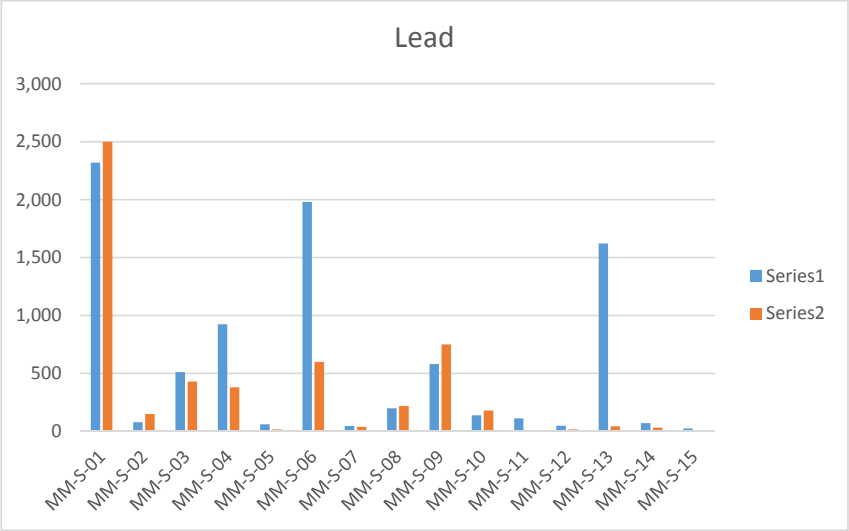


Table C-2. XRF vs Laboratory Results Comparison *(continued)*

Copper	XRF	Lab
MM-S-01	151	190
MM-S-02	28	21
MM-S-03	74	130
MM-S-04	166	100
MM-S-05	27	12
MM-S-06	308	58
MM-S-07	66	95
MM-S-08	99	69
MM-S-09	182	240
MM-S-10	299	59
MM-S-11	19	8.3
MM-S-12	20	17
MM-S-13	13	9.1
MM-S-14	19	12
MM-S-15	11	5.2



Lead	XRF	Lab
MM-S-01	2,318	2,500
MM-S-02	79	150
MM-S-03	511	430
MM-S-04	924	380
MM-S-05	61	18
MM-S-06	1,980	600
MM-S-07	46.6	39
MM-S-08	200	220
MM-S-09	582	750
MM-S-10	139	180
MM-S-11	113	9.9
MM-S-12	49	17
MM-S-13	1621	44
MM-S-14	71	32
MM-S-15	26	2.7



Mercury	XRF	Lab
MM-S-01	31	52
MM-S-02	220	210
MM-S-03	341	260
MM-S-04	6,400	2,200
MM-S-05	28.3	2.4
MM-S-06	116	51
MM-S-07	69	58
MM-S-08	48	31
MM-S-09	19.3	27
MM-S-10	56	150
MM-S-11	14.4	0.98
MM-S-12	30	18
MM-S-13	27	3.9
MM-S-14	21.8	23
MM-S-15	0	0.54

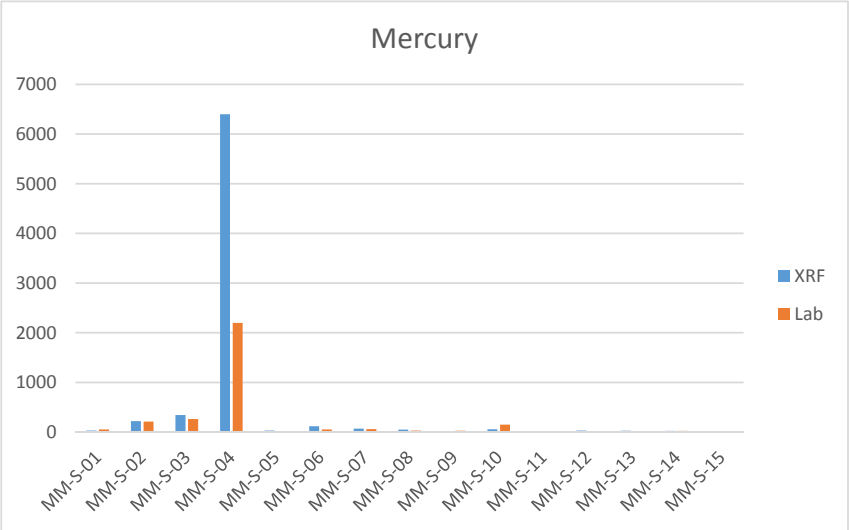
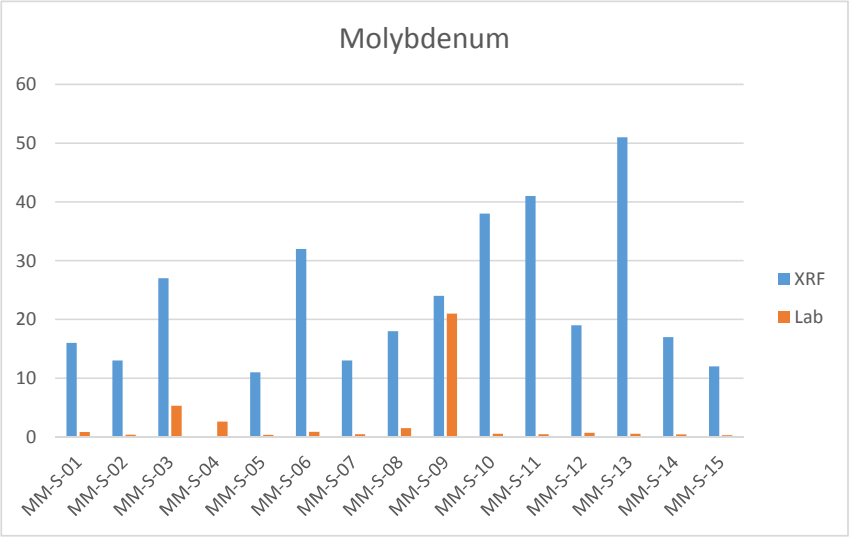
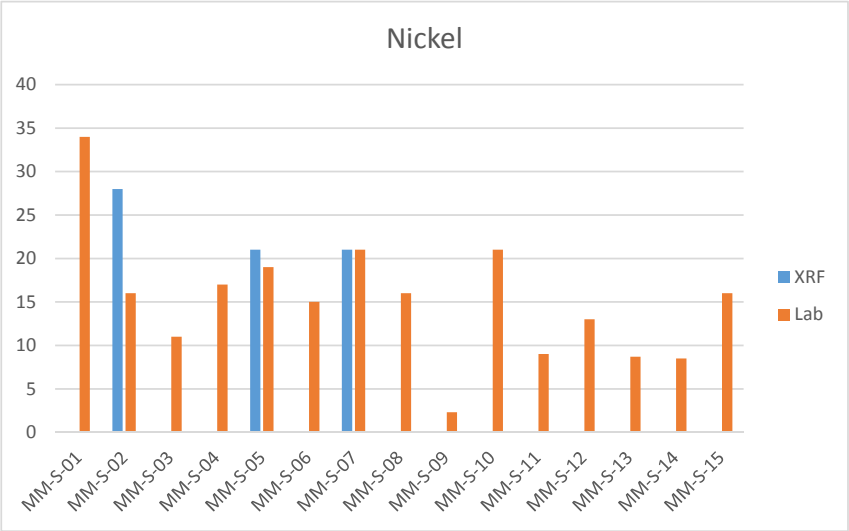


Table C-2. XRF vs Laboratory Results Comparison *(continued)*

Molybdenum	XRF	Lab
MM-S-01	16	0.83
MM-S-02	13	0.37
MM-S-03	27	5.3
MM-S-04	0	2.6
MM-S-05	11	0.34
MM-S-06	32	0.87
MM-S-07	13	0.46
MM-S-08	18	1.5
MM-S-09	24	21
MM-S-10	38	0.55
MM-S-11	41	0.45
MM-S-12	19	0.69
MM-S-13	51	0.55
MM-S-14	17	0.42
MM-S-15	12	0.3



Nickel	XRF	Lab
MM-S-01	0	34
MM-S-02	28	16
MM-S-03	0	11
MM-S-04	0	17
MM-S-05	21	19
MM-S-06	0	15
MM-S-07	21	21
MM-S-08	0	16
MM-S-09	0	2.3
MM-S-10	0	21
MM-S-11	0	9
MM-S-12	0	13
MM-S-13	0	8.7
MM-S-14	0	8.5
MM-S-15	0	16



Selenium	XRF	Lab
MM-S-01	0	**0.8**
MM-S-02	0	0.17
MM-S-03	**7.4**	**6.6**
MM-S-04	0	**2.7**
MM-S-05	0	0.05
MM-S-06	0	**1.2**
MM-S-07	0	0.34
MM-S-08	0	**0.61**
MM-S-09	**13.8**	**14**
MM-S-10	0	**0.57**
MM-S-11	0	0.14
MM-S-12	0	0.38
MM-S-13	0	0.17
MM-S-14	0	0.44
MM-S-15	0	0.13

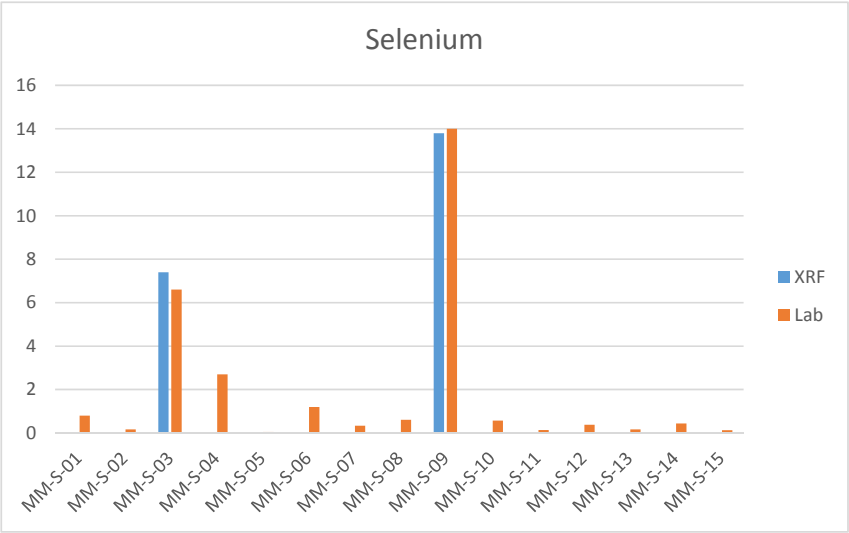
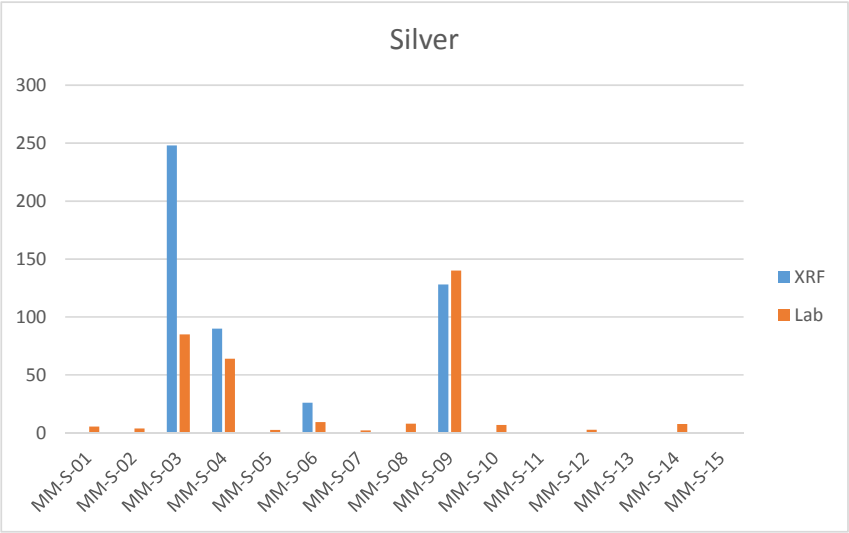
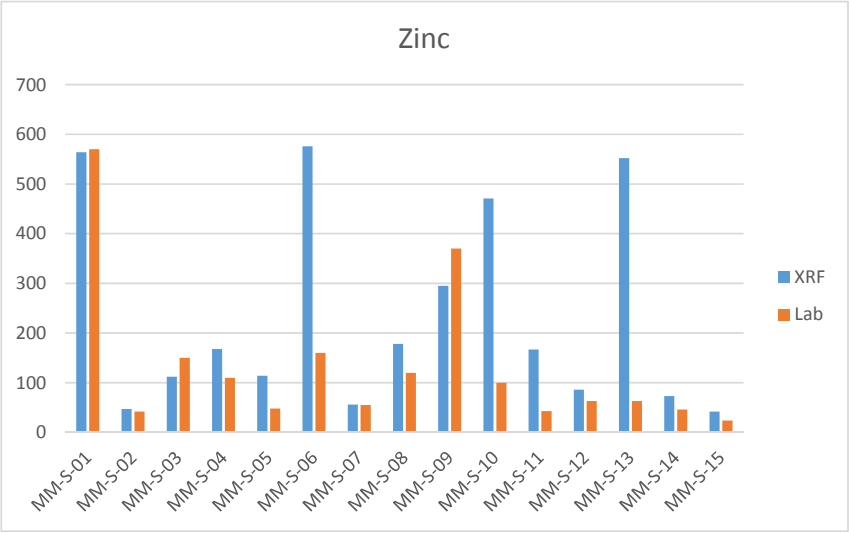


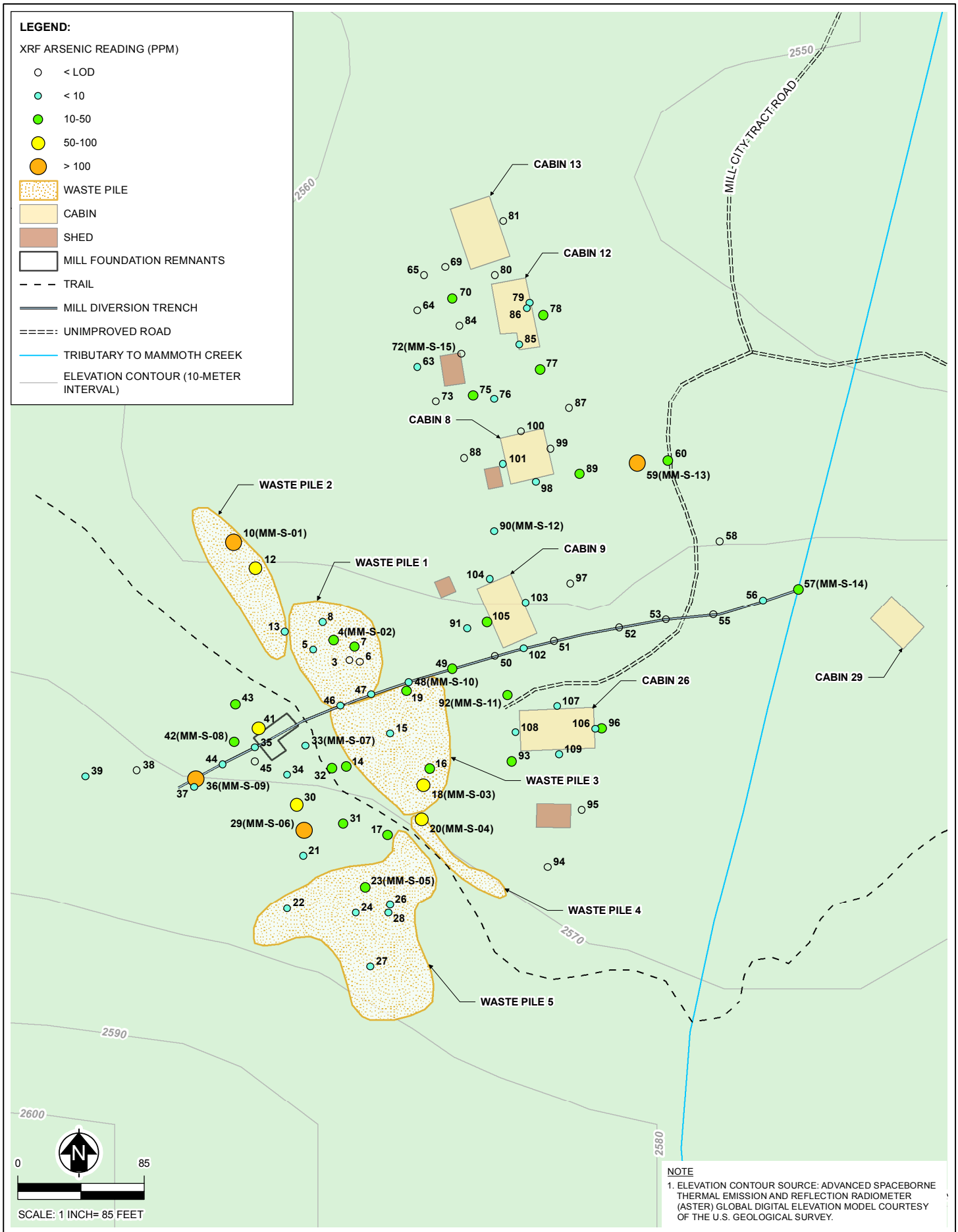
Table C-2. XRF vs Laboratory Results Comparison *(continued)*

Silver	XRF	Lab
MM-S-01	0	**5.4**
MM-S-02	0	3.8
MM-S-03	**248**	**85**
MM-S-04	**90**	**64**
MM-S-05	0	2.6
MM-S-06	**26**	**9.3**
MM-S-07	0	2.2
MM-S-08	0	**8.0**
MM-S-09	**128**	**140**
MM-S-10	0	**6.8**
MM-S-11	0	0.58
MM-S-12	0	2.7
MM-S-13	0	0.43
MM-S-14	0	**7.7**
MM-S-15	0	0.064



Zinc	XRF	Lab
MM-S-01	**564**	**570**
MM-S-02	**47**	42
MM-S-03	**112**	**150**
MM-S-04	**168**	**110**
MM-S-05	**114**	**48**
MM-S-06	**576**	**160**
MM-S-07	**56**	**55**
MM-S-08	**178**	**120**
MM-S-09	**295**	**370**
MM-S-10	**471**	**100**
MM-S-11	**167**	43
MM-S-12	**86**	**63**
MM-S-13	**552**	**63**
MM-S-14	**73**	46
MM-S-15	42	24





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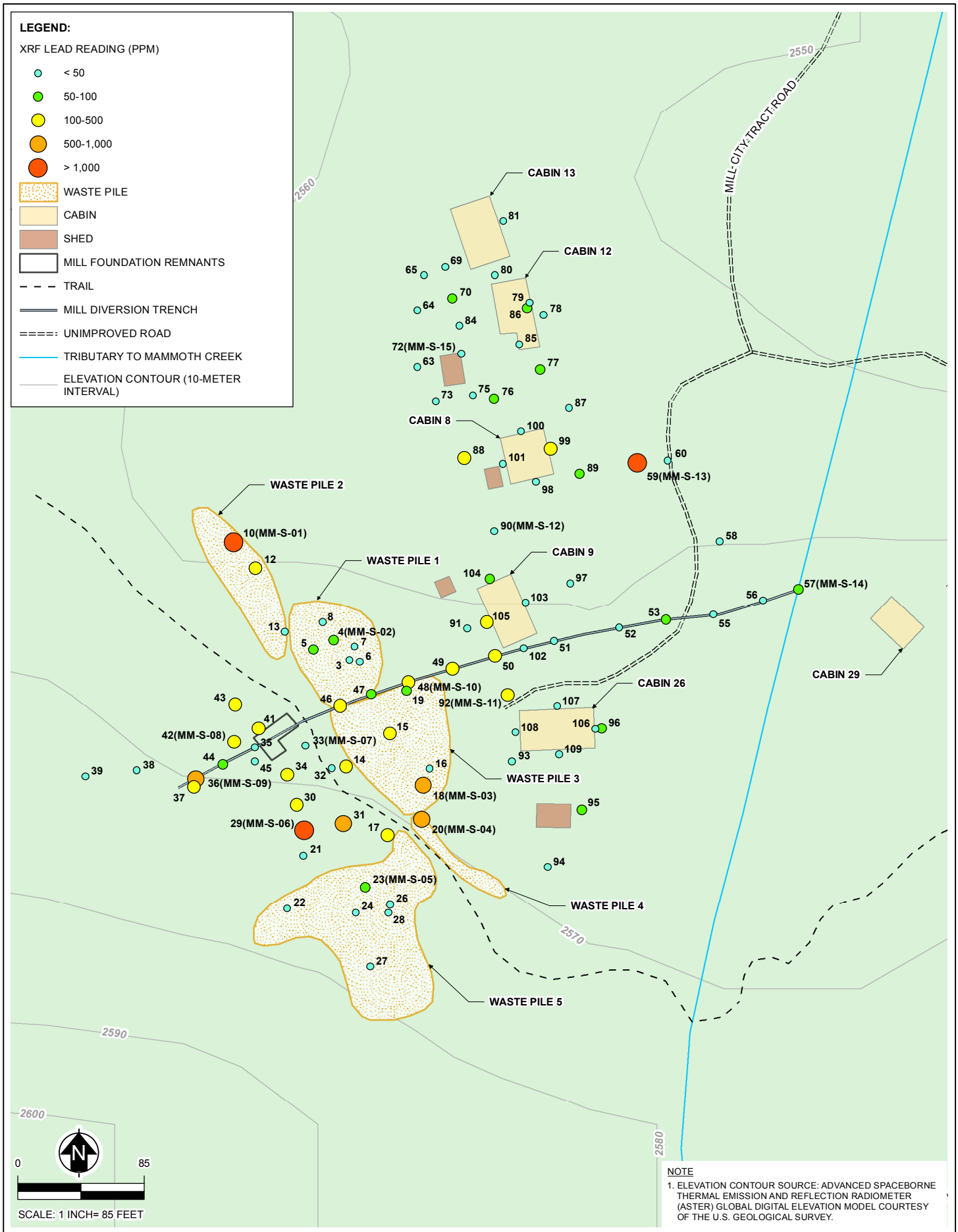
ERRG Engineering/Remediation Resources Group, Inc.
115 Sansome Street, Suite 200
San Francisco, CA 94104
(415) 395-9974

CLIENT:	XRF SCREENING RESULTS FOR ARSENIC			
U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE				
LOCATION:	DRAWN BY:	CHECKED BY:	PROJECT NO.	FIG NO.
MAMMOTH MILL INYO NATIONAL FOREST	LCV 01/21/2015	SCK 01/21/2015	2014-083	C-1



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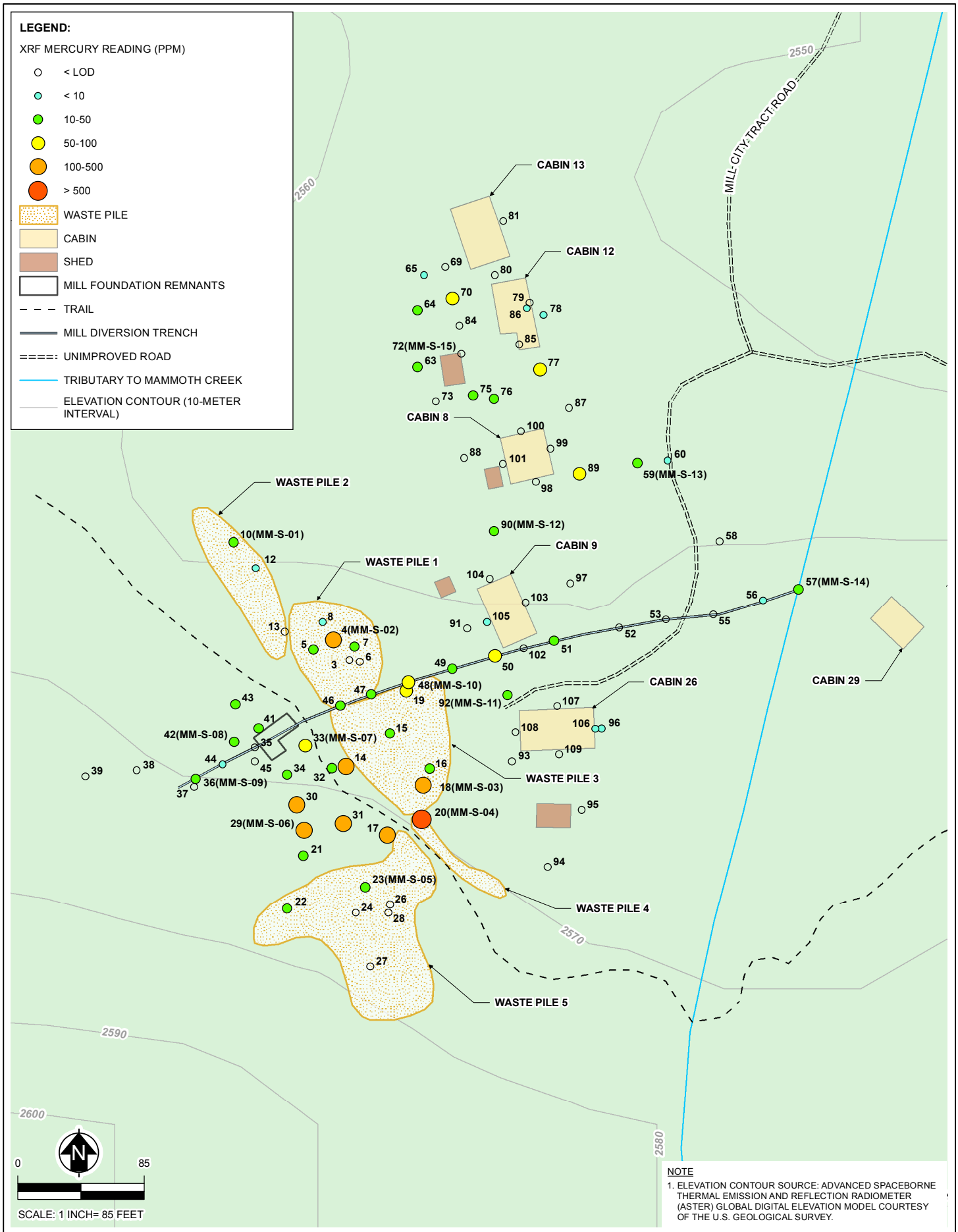
ERRG Engineering/Remediation Resources Group, Inc.
115 Sansome Street, Suite 200
San Francisco, CA 94104
(415) 395-9974

CLIENT:				
U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE	**XRF SCREENING RESULTS FOR LEAD**			
LOCATION:	DRAWN BY:	CHECKED BY:	PROJECT NO.	FIG NO.
MAMMOTH MILL INYO NATIONAL FOREST	LCV 01/21/2015	SCK 01/21/2015	2014-083	C-2



NOTE
1. ELEVATION CONTOUR SOURCE: ADVANCED SPACEBORNE THERMAL EMISSION AND REFLECTION RADIOMETER (ASTER) GLOBAL DIGITAL ELEVATION MODEL COURTESY OF THE U.S. GEOLOGICAL SURVEY.

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ERRG Engineering/Remediation Resources Group, Inc. 115 Sansome Street, Suite 200 San Francisco, CA 94104 (415) 395-9974	CLIENT: U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE	XRF SCREENING RESULTS FOR MERCURY			
	LOCATION: MAMMOTH MILL INYO NATIONAL FOREST	DRAWN BY: LCV 01/21/2015	CHECKED BY: SCK 01/21/2015	PROJECT NO. 2014-083	FIG NO. C-3

Table C-3. Mercury Vapor Results

		Mercury Concentration (ng/m^3)			
	Location ID	First	Second	Third	Average
Cabin 12	12-01	17	21	18	18.7
	12-02	22	19	22	21.0
	12-03	21	18	18	19.0
	12-04	9	12	8	9.7
	12-05	17	10	12	13.0
	12-06	13	14	16	14.3
	12-07	11	10	17	12.7
	12-08	15	12	18	15.0
	--	--	--	--	**15.4**
Cabin 8	8-01	19	15	17	17.0
	8-02	22	16	17	18.3
	8-03	24	20	23	22.3
	8-04	23	26	21	23.3
	8-05	26	28	25	26.3
	8-06	25	26	26	25.7
	8-07	27	25	32	28.0
	8-08	24	27	26	25.7
	--	--	--	--	**23.3**
Cabin 9	9-01	37	40	41	39.3
	9-02	46	41	44	43.7
	9-03	41	43	44	42.7
	9-04	41	40	42	41.0
	9-05	46	43	46	45.0
	9-06	47	48	45	46.7
	9-07	46	48	52	48.7
	9-08	49	51	53	51.0
	--	--	--	--	**44.8**
Cabin 26	26-01	53	51	54	52.7
	26-02	55	53	57	55.0
	26-03	57	60	57	58.0
	26-04	54	57	55	55.3
	26-05	55	53	54	54.0
	26-06	53	54	49	52.0
	26-07	54	48	58	53.3
	26-08	56	54	51	53.7
	--	--	--	--	**54.3**

Notes:

EPA Residential RSL for Mercury in air = 310 ng/m^3 (EPA, 2014a)

EPA = U.S. Environmental Protection Agency

ID = identification

ng/m^3 = nanogram per meter cubed

RSL = Regional Screening Level

Appendix D. Laboratory Analytical Data

(Due to size, this appendix is provided on CD only.)

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-59091-1
Client Project/Site: Mammoth PASI
Revision: 1

For:
Engineering Remediation Resources Group.
4585 Pacheco Boulevard
Suite 200
Martinez, California 94553-2233

Attn: Ms. Samantha C Knight

Authorized for release by:
8/20/2014 6:16:53 PM
Micah Smith, Project Manager II
(925)484-1919
micah.smith@testamericainc.com

Designee for

Dimple Sharma, Senior Project Manager
(925)484-1919
dimple.sharma@testamericainc.com

LINKS

Review your project results through TotalAccess

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Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Sample Summary 57
Chain of Custody 58
Receipt Checklists 62

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 720-59091-1

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-59091-1

Comments
This report was revised to report to the MDL as requested on 8/19/14 per Samantha Caruthers-Knight.

Receipt
The samples were received on 8/5/2014 6:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.8º C.

Except:

One of the two metals poly 250ml containers received for MM-SW-01, MM-SW-02, MM-SW-03 has "FIELD FILTERED" written on them, the other containers have "UNFILTERED" written on them. We only analyzed the "UNFILTERED" sample containers for total metals.

Received only one poly 250ml container for MM-SW-04 which has FIELD FILTERED written on the container, logged on HOLD per COC.

Metals
Method(s) 6010B: The following sample(s) was diluted due to the abundance of non-target analyte Fe: MM-S-01 (720-59091-8), MM-S-09 (720-59091-16). Elevated reporting limits (RLs) are provided.

Method(s) 6010B: The serial dilution performed for the following sample(s) associated with prep batch 164491 was outside control limits for Ca: (720-59091-1 SD)

Method(s) 7471A: Due to the high concentration of Hg, the matrix spike / matrix spike duplicate (MS/MSD) for prep batch 164507 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-SW-01 — Lab Sample ID: 720-59091-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.011		0.010	0.0027	mg/L	1		6010B	Total/NA
Arsenic	0.041		0.010	0.0026	mg/L	1		6010B	Total/NA
Barium	0.012		0.0050	0.0014	mg/L	1		6010B	Total/NA
Lead	0.0087		0.0050	0.0023	mg/L	1		6010B	Total/NA
Molybdenum	0.0026	J	0.010	0.0023	mg/L	1		6010B	Total/NA
Selenium	0.0076	J	0.020	0.0071	mg/L	1		6010B	Total/NA
Hardness	52		1.9	0.98	mg/L	1		SM 2340B	Total/NA

Client Sample ID: MM-SD-01 — Lab Sample ID: 720-59091-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.098	J	0.44	0.073	mg/Kg	1		6010B	Total/NA
Arsenic	14		0.88	0.075	mg/Kg	1		6010B	Total/NA
Barium	26		0.44	0.063	mg/Kg	1		6010B	Total/NA
Cadmium	0.17		0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	1.5		0.44	0.047	mg/Kg	1		6010B	Total/NA
Cobalt	0.91		0.18	0.018	mg/Kg	1		6010B	Total/NA
Copper	2.5		1.3	0.63	mg/Kg	1		6010B	Total/NA
Lead	4.2		0.44	0.093	mg/Kg	1		6010B	Total/NA
Molybdenum	0.43	J	0.44	0.057	mg/Kg	1		6010B	Total/NA
Nickel	1.7		0.44	0.045	mg/Kg	1		6010B	Total/NA
Selenium	0.35	J B	0.88	0.13	mg/Kg	1		6010B	Total/NA
Silver	0.38		0.22	0.045	mg/Kg	1		6010B	Total/NA
Vanadium	3.6		0.44	0.060	mg/Kg	1		6010B	Total/NA
Zinc	19		1.3	0.56	mg/Kg	1		6010B	Total/NA
Mercury	0.95	B	0.042	0.010	mg/Kg	5		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	6.42		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-BG-01 — Lab Sample ID: 720-59091-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.15	J	0.36	0.061	mg/Kg	1		6010B	Total/NA
Arsenic	3.9		0.73	0.062	mg/Kg	1		6010B	Total/NA
Barium	100		0.36	0.052	mg/Kg	1		6010B	Total/NA
Beryllium	0.050	J	0.073	0.024	mg/Kg	1		6010B	Total/NA
Cadmium	0.11		0.091	0.0091	mg/Kg	1		6010B	Total/NA
Chromium	3.0		0.36	0.039	mg/Kg	1		6010B	Total/NA
Cobalt	1.9		0.15	0.015	mg/Kg	1		6010B	Total/NA
Copper	5.8		1.1	0.52	mg/Kg	1		6010B	Total/NA
Lead	16		0.36	0.077	mg/Kg	1		6010B	Total/NA
Molybdenum	0.33	J	0.36	0.047	mg/Kg	1		6010B	Total/NA
Nickel	4.1		0.36	0.037	mg/Kg	1		6010B	Total/NA
Silver	0.29		0.18	0.037	mg/Kg	1		6010B	Total/NA
Vanadium	11		0.36	0.050	mg/Kg	1		6010B	Total/NA
Zinc	22		1.1	0.46	mg/Kg	1		6010B	Total/NA
Mercury	0.23	B	0.0086	0.0021	mg/Kg	1		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	4.69		0.100		SU	1		9045C	Soluble

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-SW-02 — Lab Sample ID: 720-59091-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.032		0.010	0.0026	mg/L	1		6010B	Total/NA
Barium	0.018		0.0050	0.0014	mg/L	1		6010B	Total/NA
Lead	0.0086		0.0050	0.0023	mg/L	1		6010B	Total/NA
Molybdenum	0.0023	J	0.010	0.0023	mg/L	1		6010B	Total/NA
Hardness	51		1.9	0.98	mg/L	1		SM 2340B	Total/NA

Client Sample ID: MM-SD-02 — Lab Sample ID: 720-59091-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.34	J	0.45	0.075	mg/Kg	1		6010B	Total/NA
Arsenic	50		0.91	0.077	mg/Kg	1		6010B	Total/NA
Barium	81		0.45	0.065	mg/Kg	1		6010B	Total/NA
Cadmium	0.18		0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	3.4		0.45	0.048	mg/Kg	1		6010B	Total/NA
Cobalt	2.8		0.18	0.018	mg/Kg	1		6010B	Total/NA
Copper	5.2		1.4	0.65	mg/Kg	1		6010B	Total/NA
Lead	7.2		0.45	0.095	mg/Kg	1		6010B	Total/NA
Molybdenum	0.52		0.45	0.058	mg/Kg	1		6010B	Total/NA
Nickel	6.3		0.45	0.046	mg/Kg	1		6010B	Total/NA
Selenium	0.53	J B	0.91	0.14	mg/Kg	1		6010B	Total/NA
Silver	1.1		0.23	0.046	mg/Kg	1		6010B	Total/NA
Vanadium	12		0.45	0.062	mg/Kg	1		6010B	Total/NA
Zinc	33		1.4	0.58	mg/Kg	1		6010B	Total/NA
Mercury	2.9	B	0.46	0.12	mg/Kg	50		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	6.88		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-SW-03 — Lab Sample ID: 720-59091-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.032		0.010	0.0026	mg/L	1		6010B	Total/NA
Barium	0.018		0.0050	0.0014	mg/L	1		6010B	Total/NA
Lead	0.0086		0.0050	0.0023	mg/L	1		6010B	Total/NA
Zinc	0.010	J	0.020	0.0096	mg/L	1		6010B	Total/NA
Hardness	50		1.9	0.98	mg/L	1		SM 2340B	Total/NA

Client Sample ID: MM-SD-03 — Lab Sample ID: 720-59091-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.24	J	0.32	0.054	mg/Kg	1		6010B	Total/NA
Arsenic	36		0.65	0.055	mg/Kg	1		6010B	Total/NA
Barium	38		0.32	0.046	mg/Kg	1		6010B	Total/NA
Beryllium	0.032	J	0.065	0.021	mg/Kg	1		6010B	Total/NA
Cadmium	0.22		0.081	0.0081	mg/Kg	1		6010B	Total/NA
Chromium	2.4		0.32	0.034	mg/Kg	1		6010B	Total/NA
Cobalt	2.2		0.13	0.013	mg/Kg	1		6010B	Total/NA
Copper	5.1		0.97	0.46	mg/Kg	1		6010B	Total/NA
Lead	7.0		0.32	0.068	mg/Kg	1		6010B	Total/NA
Molybdenum	0.38		0.32	0.042	mg/Kg	1		6010B	Total/NA
Nickel	3.7		0.32	0.033	mg/Kg	1		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-SD-03 (Continued) — Lab Sample ID: 720-59091-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Selenium	0.70	B	0.65	0.097	mg/Kg	1		6010B	Total/NA
Silver	0.66		0.16	0.033	mg/Kg	1		6010B	Total/NA
Vanadium	7.5		0.32	0.044	mg/Kg	1		6010B	Total/NA
Zinc	25		0.97	0.41	mg/Kg	1		6010B	Total/NA
Mercury	2.6	B	0.46	0.12	mg/Kg	50		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.61		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-S-01 — Lab Sample ID: 720-59091-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	230		1.8	0.30	mg/Kg	4		6010B	Total/NA
Arsenic	19		3.7	0.31	mg/Kg	4		6010B	Total/NA
Barium	210		1.8	0.26	mg/Kg	4		6010B	Total/NA
Cadmium	0.62		0.46	0.046	mg/Kg	4		6010B	Total/NA
Chromium	8.7		1.8	0.19	mg/Kg	4		6010B	Total/NA
Cobalt	17		0.73	0.073	mg/Kg	4		6010B	Total/NA
Copper	190		5.5	2.6	mg/Kg	4		6010B	Total/NA
Lead	2500		1.8	0.39	mg/Kg	4		6010B	Total/NA
Molybdenum	0.83	J	1.8	0.23	mg/Kg	4		6010B	Total/NA
Nickel	34		1.8	0.19	mg/Kg	4		6010B	Total/NA
Selenium	0.80	J B	3.7	0.55	mg/Kg	4		6010B	Total/NA
Silver	5.4		0.92	0.19	mg/Kg	4		6010B	Total/NA
Vanadium	25		1.8	0.25	mg/Kg	4		6010B	Total/NA
Zinc	570		5.5	2.3	mg/Kg	4		6010B	Total/NA
Mercury	52	B	0.42	0.11	mg/Kg	50		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.01		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-S-02 — Lab Sample ID: 720-59091-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	4.2		0.45	0.075	mg/Kg	1		6010B	Total/NA
Arsenic	12		0.90	0.077	mg/Kg	1		6010B	Total/NA
Barium	230		0.45	0.064	mg/Kg	1		6010B	Total/NA
Beryllium	0.27		0.090	0.029	mg/Kg	1		6010B	Total/NA
Cadmium	0.15		0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	7.0		0.45	0.048	mg/Kg	1		6010B	Total/NA
Cobalt	5.4		0.18	0.018	mg/Kg	1		6010B	Total/NA
Copper	21		1.4	0.64	mg/Kg	1		6010B	Total/NA
Lead	150		0.45	0.095	mg/Kg	1		6010B	Total/NA
Molybdenum	0.37	J	0.45	0.058	mg/Kg	1		6010B	Total/NA
Nickel	16		0.45	0.046	mg/Kg	1		6010B	Total/NA
Selenium	0.17	J B	0.90	0.14	mg/Kg	1		6010B	Total/NA
Silver	3.8		0.23	0.045	mg/Kg	1		6010B	Total/NA
Vanadium	24		0.45	0.061	mg/Kg	1		6010B	Total/NA
Zinc	42		1.4	0.57	mg/Kg	1		6010B	Total/NA
Mercury	210	B	4.7	1.2	mg/Kg	500		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.60		0.100		SU	1		9045C	Soluble

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-03 — Lab Sample ID: 720-59091-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	25		0.40	0.066	mg/Kg	1		6010B	Total/NA
Arsenic	84		0.80	0.068	mg/Kg	1		6010B	Total/NA
Barium	1000		0.40	0.057	mg/Kg	1		6010B	Total/NA
Beryllium	0.17		0.080	0.026	mg/Kg	1		6010B	Total/NA
Cadmium	2.4		0.10	0.0099	mg/Kg	1		6010B	Total/NA
Chromium	5.5		0.40	0.042	mg/Kg	1		6010B	Total/NA
Cobalt	3.7		0.16	0.016	mg/Kg	1		6010B	Total/NA
Copper	130		1.2	0.57	mg/Kg	1		6010B	Total/NA
Lead	430		0.40	0.084	mg/Kg	1		6010B	Total/NA
Molybdenum	5.3		0.40	0.051	mg/Kg	1		6010B	Total/NA
Nickel	11		0.40	0.041	mg/Kg	1		6010B	Total/NA
Selenium	6.6	B	0.80	0.12	mg/Kg	1		6010B	Total/NA
Silver	85		0.20	0.040	mg/Kg	1		6010B	Total/NA
Vanadium	21		0.40	0.054	mg/Kg	1		6010B	Total/NA
Zinc	150		1.2	0.51	mg/Kg	1		6010B	Total/NA
Mercury	260	B	4.5	1.1	mg/Kg	500		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.37		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-S-04 — Lab Sample ID: 720-59091-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	19		0.37	0.061	mg/Kg	1		6010B	Total/NA
Arsenic	36		0.74	0.063	mg/Kg	1		6010B	Total/NA
Barium	950		0.37	0.052	mg/Kg	1		6010B	Total/NA
Beryllium	0.21		0.074	0.024	mg/Kg	1		6010B	Total/NA
Cadmium	1.4		0.092	0.0091	mg/Kg	1		6010B	Total/NA
Chromium	6.2		0.37	0.039	mg/Kg	1		6010B	Total/NA
Cobalt	4.9		0.15	0.015	mg/Kg	1		6010B	Total/NA
Copper	100		1.1	0.52	mg/Kg	1		6010B	Total/NA
Lead	380		0.37	0.077	mg/Kg	1		6010B	Total/NA
Molybdenum	2.6		0.37	0.047	mg/Kg	1		6010B	Total/NA
Nickel	17		0.37	0.038	mg/Kg	1		6010B	Total/NA
Selenium	2.7	B	0.74	0.11	mg/Kg	1		6010B	Total/NA
Silver	64		0.18	0.037	mg/Kg	1		6010B	Total/NA
Vanadium	21		0.37	0.050	mg/Kg	1		6010B	Total/NA
Zinc	110		1.1	0.47	mg/Kg	1		6010B	Total/NA
Mercury	2200	B	43	11	mg/Kg	5000		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.28		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-S-05 — Lab Sample ID: 720-59091-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.71		0.38	0.062	mg/Kg	1		6010B	Total/NA
Arsenic	9.7		0.75	0.064	mg/Kg	1		6010B	Total/NA
Barium	150		0.38	0.053	mg/Kg	1		6010B	Total/NA
Beryllium	0.24		0.075	0.024	mg/Kg	1		6010B	Total/NA
Cadmium	0.18		0.094	0.0093	mg/Kg	1		6010B	Total/NA
Chromium	6.2		0.38	0.040	mg/Kg	1		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MM-S-05 (Continued) — Lab Sample ID: 720-59091-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	5.6		0.15	0.015	mg/Kg	1		6010B	Total/NA
Copper	12		1.1	0.54	mg/Kg	1		6010B	Total/NA
Lead	18		0.38	0.079	mg/Kg	1		6010B	Total/NA
Molybdenum	0.34	J	0.38	0.048	mg/Kg	1		6010B	Total/NA
Nickel	19		0.38	0.038	mg/Kg	1		6010B	Total/NA
Silver	2.6		0.19	0.038	mg/Kg	1		6010B	Total/NA
Vanadium	23		0.38	0.051	mg/Kg	1		6010B	Total/NA
Zinc	48		1.1	0.48	mg/Kg	1		6010B	Total/NA
Mercury	2.4	B	0.48	0.12	mg/Kg	50		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.98		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-S-06 — Lab Sample ID: 720-59091-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	23		0.38	0.064	mg/Kg	1		6010B	Total/NA
Arsenic	28		0.77	0.065	mg/Kg	1		6010B	Total/NA
Barium	750		0.38	0.055	mg/Kg	1		6010B	Total/NA
Beryllium	0.17		0.077	0.025	mg/Kg	1		6010B	Total/NA
Cadmium	0.97		0.096	0.0095	mg/Kg	1		6010B	Total/NA
Chromium	6.1		0.38	0.041	mg/Kg	1		6010B	Total/NA
Cobalt	4.9		0.15	0.015	mg/Kg	1		6010B	Total/NA
Copper	58		1.2	0.55	mg/Kg	1		6010B	Total/NA
Lead	600		0.38	0.081	mg/Kg	1		6010B	Total/NA
Molybdenum	0.87		0.38	0.049	mg/Kg	1		6010B	Total/NA
Nickel	15		0.38	0.039	mg/Kg	1		6010B	Total/NA
Selenium	1.2	B	0.77	0.12	mg/Kg	1		6010B	Total/NA
Silver	9.3		0.19	0.039	mg/Kg	1		6010B	Total/NA
Vanadium	19		0.38	0.052	mg/Kg	1		6010B	Total/NA
Zinc	160		1.2	0.49	mg/Kg	1		6010B	Total/NA
Mercury	51	B	0.43	0.11	mg/Kg	50		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.51		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-S-07 — Lab Sample ID: 720-59091-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	1.0		0.42	0.069	mg/Kg	1		6010B	Total/NA
Arsenic	11		0.83	0.071	mg/Kg	1		6010B	Total/NA
Barium	220		0.42	0.059	mg/Kg	1		6010B	Total/NA
Beryllium	0.20		0.083	0.027	mg/Kg	1		6010B	Total/NA
Cadmium	0.31		0.10	0.010	mg/Kg	1		6010B	Total/NA
Chromium	9.4		0.42	0.044	mg/Kg	1		6010B	Total/NA
Cobalt	6.0		0.17	0.017	mg/Kg	1		6010B	Total/NA
Copper	95		1.3	0.59	mg/Kg	1		6010B	Total/NA
Lead	39		0.42	0.088	mg/Kg	1		6010B	Total/NA
Molybdenum	0.46		0.42	0.053	mg/Kg	1		6010B	Total/NA
Nickel	21		0.42	0.043	mg/Kg	1		6010B	Total/NA
Selenium	0.34	J B	0.83	0.13	mg/Kg	1		6010B	Total/NA
Silver	2.2		0.21	0.042	mg/Kg	1		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MM-S-07 (Continued) — Lab Sample ID: 720-59091-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vanadium	29		0.42	0.057	mg/Kg	1		6010B	Total/NA
Zinc	55		1.3	0.53	mg/Kg	1		6010B	Total/NA
Mercury	58	B	0.47	0.12	mg/Kg	50		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.47		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-S-08 — Lab Sample ID: 720-59091-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	4.0		0.45	0.075	mg/Kg	1		6010B	Total/NA
Arsenic	15		0.90	0.077	mg/Kg	1		6010B	Total/NA
Barium	240		0.45	0.064	mg/Kg	1		6010B	Total/NA
Beryllium	0.12		0.090	0.029	mg/Kg	1		6010B	Total/NA
Cadmium	0.99		0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	6.4		0.45	0.048	mg/Kg	1		6010B	Total/NA
Cobalt	5.7		0.18	0.018	mg/Kg	1		6010B	Total/NA
Copper	69		1.4	0.64	mg/Kg	1		6010B	Total/NA
Lead	220		0.45	0.095	mg/Kg	1		6010B	Total/NA
Molybdenum	1.5		0.45	0.058	mg/Kg	1		6010B	Total/NA
Nickel	16		0.45	0.046	mg/Kg	1		6010B	Total/NA
Selenium	0.61	J B	0.90	0.14	mg/Kg	1		6010B	Total/NA
Silver	8.0		0.23	0.045	mg/Kg	1		6010B	Total/NA
Vanadium	22		0.45	0.061	mg/Kg	1		6010B	Total/NA
Zinc	120		1.4	0.57	mg/Kg	1		6010B	Total/NA
Mercury	31	B	0.46	0.12	mg/Kg	50		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.38		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-S-09 — Lab Sample ID: 720-59091-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	35		1.7	0.29	mg/Kg	4		6010B	Total/NA
Arsenic	210		3.5	0.30	mg/Kg	4		6010B	Total/NA
Barium	1300		1.7	0.25	mg/Kg	4		6010B	Total/NA
Beryllium	0.12	J	0.35	0.11	mg/Kg	4		6010B	Total/NA
Cadmium	1.5		0.43	0.043	mg/Kg	4		6010B	Total/NA
Chromium	3.8		1.7	0.18	mg/Kg	4		6010B	Total/NA
Cobalt	1.1		0.70	0.070	mg/Kg	4		6010B	Total/NA
Copper	240		5.2	2.5	mg/Kg	4		6010B	Total/NA
Lead	750		1.7	0.37	mg/Kg	4		6010B	Total/NA
Molybdenum	21		1.7	0.22	mg/Kg	4		6010B	Total/NA
Nickel	2.3		1.7	0.18	mg/Kg	4		6010B	Total/NA
Selenium	14	B	3.5	0.52	mg/Kg	4		6010B	Total/NA
Silver	140		0.87	0.18	mg/Kg	4		6010B	Total/NA
Vanadium	21		1.7	0.24	mg/Kg	4		6010B	Total/NA
Zinc	370		5.2	2.2	mg/Kg	4		6010B	Total/NA
Mercury	27	B	0.44	0.11	mg/Kg	50		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.90		0.100		SU	1		9045C	Soluble

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-10 — Lab Sample ID: 720-59091-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	5.1		0.43	0.072	mg/Kg	1		6010B	Total/NA
Arsenic	12		0.86	0.073	mg/Kg	1		6010B	Total/NA
Barium	250		0.43	0.061	mg/Kg	1		6010B	Total/NA
Beryllium	0.20		0.086	0.028	mg/Kg	1		6010B	Total/NA
Cadmium	1.0		0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	7.1		0.43	0.046	mg/Kg	1		6010B	Total/NA
Cobalt	6.1		0.17	0.017	mg/Kg	1		6010B	Total/NA
Copper	59		1.3	0.61	mg/Kg	1		6010B	Total/NA
Lead	180		0.43	0.091	mg/Kg	1		6010B	Total/NA
Molybdenum	0.55		0.43	0.055	mg/Kg	1		6010B	Total/NA
Nickel	21		0.43	0.044	mg/Kg	1		6010B	Total/NA
Selenium	0.57	J B	0.86	0.13	mg/Kg	1		6010B	Total/NA
Silver	6.8		0.22	0.044	mg/Kg	1		6010B	Total/NA
Vanadium	22		0.43	0.059	mg/Kg	1		6010B	Total/NA
Zinc	100		1.3	0.55	mg/Kg	1		6010B	Total/NA
Mercury	150	B	4.6	1.2	mg/Kg	500		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.23		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-S-11 — Lab Sample ID: 720-59091-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.28	J	0.47	0.078	mg/Kg	1		6010B	Total/NA
Arsenic	4.4		0.93	0.079	mg/Kg	1		6010B	Total/NA
Barium	160		0.47	0.066	mg/Kg	1		6010B	Total/NA
Beryllium	0.16		0.093	0.030	mg/Kg	1		6010B	Total/NA
Cadmium	0.25		0.12	0.012	mg/Kg	1		6010B	Total/NA
Chromium	4.7		0.47	0.050	mg/Kg	1		6010B	Total/NA
Cobalt	4.2		0.19	0.019	mg/Kg	1		6010B	Total/NA
Copper	8.3		1.4	0.67	mg/Kg	1		6010B	Total/NA
Lead	9.9		0.47	0.098	mg/Kg	1		6010B	Total/NA
Molybdenum	0.45	J	0.47	0.060	mg/Kg	1		6010B	Total/NA
Nickel	9.0		0.47	0.048	mg/Kg	1		6010B	Total/NA
Selenium	0.14	J B	0.93	0.14	mg/Kg	1		6010B	Total/NA
Silver	0.58		0.23	0.047	mg/Kg	1		6010B	Total/NA
Vanadium	13		0.47	0.064	mg/Kg	1		6010B	Total/NA
Zinc	43		1.4	0.59	mg/Kg	1		6010B	Total/NA
Mercury	0.98	B	0.045	0.011	mg/Kg	5		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.25		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-S-12 — Lab Sample ID: 720-59091-19

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.55		0.45	0.075	mg/Kg	1		6010B	Total/NA
Arsenic	9.1		0.91	0.077	mg/Kg	1		6010B	Total/NA
Barium	140		0.45	0.065	mg/Kg	1		6010B	Total/NA
Beryllium	0.19		0.091	0.030	mg/Kg	1		6010B	Total/NA
Cadmium	0.48		0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	5.6		0.45	0.048	mg/Kg	1		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MM-S-12 (Continued) — Lab Sample ID: 720-59091-19

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	4.5		0.18	0.018	mg/Kg	1		6010B	Total/NA
Copper	17		1.4	0.65	mg/Kg	1		6010B	Total/NA
Lead	17		0.45	0.095	mg/Kg	1		6010B	Total/NA
Molybdenum	0.69		0.45	0.058	mg/Kg	1		6010B	Total/NA
Nickel	13		0.45	0.046	mg/Kg	1		6010B	Total/NA
Selenium	0.38	J B	0.91	0.14	mg/Kg	1		6010B	Total/NA
Silver	2.7		0.23	0.046	mg/Kg	1		6010B	Total/NA
Vanadium	19		0.45	0.062	mg/Kg	1		6010B	Total/NA
Zinc	63		1.4	0.58	mg/Kg	1		6010B	Total/NA
Mercury	18	B	0.42	0.11	mg/Kg	50		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.14		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-S-13 — Lab Sample ID: 720-59091-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.19	J B	0.44	0.073	mg/Kg	1		6010B	Total/NA
Arsenic	4.0		0.88	0.075	mg/Kg	1		6010B	Total/NA
Barium	100		0.44	0.063	mg/Kg	1		6010B	Total/NA
Beryllium	0.12		0.088	0.029	mg/Kg	1		6010B	Total/NA
Cadmium	0.35		0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	7.4		0.44	0.047	mg/Kg	1		6010B	Total/NA
Cobalt	4.5		0.18	0.018	mg/Kg	1		6010B	Total/NA
Copper	9.1		1.3	0.63	mg/Kg	1		6010B	Total/NA
Lead	44		0.44	0.093	mg/Kg	1		6010B	Total/NA
Molybdenum	0.55	B	0.44	0.057	mg/Kg	1		6010B	Total/NA
Nickel	8.7		0.44	0.045	mg/Kg	1		6010B	Total/NA
Selenium	0.17	J	0.88	0.13	mg/Kg	1		6010B	Total/NA
Silver	0.43		0.22	0.045	mg/Kg	1		6010B	Total/NA
Vanadium	14		0.44	0.060	mg/Kg	1		6010B	Total/NA
Zinc	63		1.3	0.56	mg/Kg	1		6010B	Total/NA
Mercury	3.9	B	0.42	0.11	mg/Kg	50		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	4.89		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-S-14 — Lab Sample ID: 720-59091-21

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	1.0	B	0.35	0.058	mg/Kg	1		6010B	Total/NA
Arsenic	26		0.69	0.059	mg/Kg	1		6010B	Total/NA
Barium	120		0.35	0.049	mg/Kg	1		6010B	Total/NA
Cadmium	0.39		0.087	0.0086	mg/Kg	1		6010B	Total/NA
Chromium	6.4		0.35	0.037	mg/Kg	1		6010B	Total/NA
Cobalt	3.8		0.14	0.014	mg/Kg	1		6010B	Total/NA
Copper	12		1.0	0.49	mg/Kg	1		6010B	Total/NA
Lead	32		0.35	0.073	mg/Kg	1		6010B	Total/NA
Molybdenum	0.42	B	0.35	0.044	mg/Kg	1		6010B	Total/NA
Nickel	8.5		0.35	0.035	mg/Kg	1		6010B	Total/NA
Selenium	0.44	J	0.69	0.10	mg/Kg	1		6010B	Total/NA
Silver	7.7		0.17	0.035	mg/Kg	1		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MM-S-14 (Continued) — Lab Sample ID: 720-59091-21

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vanadium	27		0.35	0.047	mg/Kg	1		6010B	Total/NA
Zinc	46		1.0	0.44	mg/Kg	1		6010B	Total/NA
Mercury	23	B	0.47	0.12	mg/Kg	50		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.21		0.100		SU	1		9045C	Soluble

Client Sample ID: MM-S-15 — Lab Sample ID: 720-59091-22

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	3.3		0.86	0.073	mg/Kg	1		6010B	Total/NA
Barium	49		0.43	0.061	mg/Kg	1		6010B	Total/NA
Beryllium	0.11		0.086	0.028	mg/Kg	1		6010B	Total/NA
Cadmium	0.071	J	0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	6.0		0.43	0.046	mg/Kg	1		6010B	Total/NA
Cobalt	4.3		0.17	0.017	mg/Kg	1		6010B	Total/NA
Copper	5.2		1.3	0.61	mg/Kg	1		6010B	Total/NA
Lead	2.7		0.43	0.091	mg/Kg	1		6010B	Total/NA
Molybdenum	0.30	J B	0.43	0.055	mg/Kg	1		6010B	Total/NA
Nickel	16		0.43	0.044	mg/Kg	1		6010B	Total/NA
Silver	0.064	J	0.22	0.044	mg/Kg	1		6010B	Total/NA
Vanadium	20		0.43	0.059	mg/Kg	1		6010B	Total/NA
Zinc	24		1.3	0.55	mg/Kg	1		6010B	Total/NA
Mercury	0.54	B	0.0090	0.0022	mg/Kg	1		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.58		0.100		SU	1		9045C	Soluble

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-SW-01

Lab Sample ID: 720-59091-1

Date Collected: 07/31/14 10:25

Matrix: Water

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.011**		0.010	0.0027	mg/L		08/06/14 15:42	08/07/14 15:49	1
Arsenic	**0.041**		0.010	0.0026	mg/L		08/06/14 15:42	08/07/14 15:49	1
Barium	**0.012**		0.0050	0.0014	mg/L		08/06/14 15:42	08/07/14 15:49	1
Beryllium	ND		0.0020	0.00033	mg/L		08/06/14 15:42	08/07/14 15:49	1
Cadmium	ND		0.0025	0.0013	mg/L		08/06/14 15:42	08/07/14 15:49	1
Chromium	ND		0.010	0.0015	mg/L		08/06/14 15:42	08/07/14 15:49	1
Cobalt	ND		0.0020	0.0012	mg/L		08/06/14 15:42	08/07/14 15:49	1
Copper	ND		0.020	0.0015	mg/L		08/06/14 15:42	08/07/14 15:49	1
Lead	**0.0087**		0.0050	0.0023	mg/L		08/06/14 15:42	08/07/14 15:49	1
Molybdenum	**0.0026**	**J**	0.010	0.0023	mg/L		08/06/14 15:42	08/12/14 11:17	1
Nickel	ND		0.010	0.00080	mg/L		08/06/14 15:42	08/07/14 15:49	1
Selenium	**0.0076**	**J**	0.020	0.0071	mg/L		08/06/14 15:42	08/07/14 15:49	1
Silver	ND		0.0050	0.0012	mg/L		08/06/14 15:42	08/07/14 15:49	1
Thallium	ND		0.010	0.0035	mg/L		08/06/14 15:42	08/07/14 15:49	1
Vanadium	ND		0.010	0.00070	mg/L		08/06/14 15:42	08/07/14 15:49	1
Zinc	ND		0.020	0.0096	mg/L		08/06/14 15:42	08/07/14 15:49	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/07/14 16:43	08/08/14 11:04	1

Method: SM 2340B - Hardness, Calculation

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness	**52**		1.9	0.98	mg/L			08/12/14 12:51	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-SD-01

Lab Sample ID: 720-59091-2

Date Collected: 07/31/14 10:30
Matrix: Solid
Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.098	J	0.44	0.073	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Arsenic	14		0.88	0.075	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Barium	26		0.44	0.063	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Beryllium	ND		0.088	0.029	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Cadmium	0.17		0.11	0.011	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Chromium	1.5		0.44	0.047	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Cobalt	0.91		0.18	0.018	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Copper	2.5		1.3	0.63	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Lead	4.2		0.44	0.093	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Molybdenum	0.43	J	0.44	0.057	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Nickel	1.7		0.44	0.045	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Selenium	0.35	J B	0.88	0.13	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Silver	0.38		0.22	0.045	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Thallium	ND		0.44	0.13	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Vanadium	3.6		0.44	0.060	mg/Kg		08/06/14 13:39	08/07/14 10:35	1
Zinc	19		1.3	0.56	mg/Kg		08/06/14 13:39	08/07/14 10:35	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.95	B	0.042	0.010	mg/Kg		08/06/14 19:35	08/07/14 19:12	5

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.42		0.100		SU			08/07/14 15:23	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-BG-01

Lab Sample ID: 720-59091-3

Date Collected: 07/31/14 10:45

Matrix: Solid

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.15	J	0.36	0.061	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Arsenic	3.9		0.73	0.062	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Barium	100		0.36	0.052	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Beryllium	0.050	J	0.073	0.024	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Cadmium	0.11		0.091	0.0091	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Chromium	3.0		0.36	0.039	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Cobalt	1.9		0.15	0.015	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Copper	5.8		1.1	0.52	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Lead	16		0.36	0.077	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Molybdenum	0.33	J	0.36	0.047	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Nickel	4.1		0.36	0.037	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Selenium	ND		0.73	0.11	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Silver	0.29		0.18	0.037	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Thallium	ND		0.36	0.11	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Vanadium	11		0.36	0.050	mg/Kg		08/06/14 14:50	08/07/14 10:40	1
Zinc	22		1.1	0.46	mg/Kg		08/06/14 14:50	08/07/14 10:40	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.23	B	0.0086	0.0021	mg/Kg		08/06/14 19:35	08/07/14 19:14	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	4.69		0.100		SU			08/07/14 15:27	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-SW-02

Lab Sample ID: 720-59091-4

Date Collected: 07/31/14 11:15

Matrix: Water

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010	0.0027	mg/L		08/06/14 15:42	08/07/14 16:03	1
Arsenic	**0.032**		0.010	0.0026	mg/L		08/06/14 15:42	08/07/14 16:03	1
Barium	**0.018**		0.0050	0.0014	mg/L		08/06/14 15:42	08/07/14 16:03	1
Beryllium	ND		0.0020	0.00033	mg/L		08/06/14 15:42	08/07/14 16:03	1
Cadmium	ND		0.0025	0.0013	mg/L		08/06/14 15:42	08/07/14 16:03	1
Chromium	ND		0.010	0.0015	mg/L		08/06/14 15:42	08/07/14 16:03	1
Cobalt	ND		0.0020	0.0012	mg/L		08/06/14 15:42	08/07/14 16:03	1
Copper	ND		0.020	0.0015	mg/L		08/06/14 15:42	08/07/14 16:03	1
Lead	**0.0086**		0.0050	0.0023	mg/L		08/06/14 15:42	08/07/14 16:03	1
Molybdenum	**0.0023**	**J**	0.010	0.0023	mg/L		08/06/14 15:42	08/07/14 16:03	1
Nickel	ND		0.010	0.00080	mg/L		08/06/14 15:42	08/07/14 16:03	1
Selenium	ND		0.020	0.0071	mg/L		08/06/14 15:42	08/07/14 16:03	1
Silver	ND		0.0050	0.0012	mg/L		08/06/14 15:42	08/07/14 16:03	1
Thallium	ND		0.010	0.0035	mg/L		08/06/14 15:42	08/07/14 16:03	1
Vanadium	ND		0.010	0.00070	mg/L		08/06/14 15:42	08/07/14 16:03	1
Zinc	ND		0.020	0.0096	mg/L		08/06/14 15:42	08/07/14 16:03	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/07/14 16:43	08/08/14 11:06	1

Method: SM 2340B - Hardness, Calculation

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness	**51**		1.9	0.98	mg/L			08/12/14 12:51	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-SD-02

Lab Sample ID: 720-59091-5

Date Collected: 07/31/14 11:20

Matrix: Solid

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.34	J	0.45	0.075	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Arsenic	50		0.91	0.077	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Barium	81		0.45	0.065	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Beryllium	ND		0.091	0.030	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Cadmium	0.18		0.11	0.011	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Chromium	3.4		0.45	0.048	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Cobalt	2.8		0.18	0.018	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Copper	5.2		1.4	0.65	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Lead	7.2		0.45	0.095	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Molybdenum	0.52		0.45	0.058	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Nickel	6.3		0.45	0.046	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Selenium	0.53	J B	0.91	0.14	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Silver	1.1		0.23	0.046	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Thallium	ND		0.45	0.13	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Vanadium	12		0.45	0.062	mg/Kg		08/06/14 14:50	08/07/14 10:45	1
Zinc	33		1.4	0.58	mg/Kg		08/06/14 14:50	08/07/14 10:45	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	2.9	B	0.46	0.12	mg/Kg		08/06/14 19:35	08/07/14 18:08	50

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.88		0.100		SU			08/07/14 15:29	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-SW-03

Lab Sample ID: 720-59091-6

Date Collected: 07/31/14 11:40

Matrix: Water

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010	0.0027	mg/L		08/06/14 15:42	08/07/14 16:08	1
Arsenic	**0.032**		0.010	0.0026	mg/L		08/06/14 15:42	08/07/14 16:08	1
Barium	**0.018**		0.0050	0.0014	mg/L		08/06/14 15:42	08/07/14 16:08	1
Beryllium	ND		0.0020	0.00033	mg/L		08/06/14 15:42	08/07/14 16:08	1
Cadmium	ND		0.0025	0.0013	mg/L		08/06/14 15:42	08/07/14 16:08	1
Chromium	ND		0.010	0.0015	mg/L		08/06/14 15:42	08/07/14 16:08	1
Cobalt	ND		0.0020	0.0012	mg/L		08/06/14 15:42	08/07/14 16:08	1
Copper	ND		0.020	0.0015	mg/L		08/06/14 15:42	08/07/14 16:08	1
Lead	**0.0086**		0.0050	0.0023	mg/L		08/06/14 15:42	08/07/14 16:08	1
Molybdenum	ND		0.010	0.0023	mg/L		08/06/14 15:42	08/07/14 16:08	1
Nickel	ND		0.010	0.00080	mg/L		08/06/14 15:42	08/07/14 16:08	1
Selenium	ND		0.020	0.0071	mg/L		08/06/14 15:42	08/07/14 16:08	1
Silver	ND		0.0050	0.0012	mg/L		08/06/14 15:42	08/07/14 16:08	1
Thallium	ND		0.010	0.0035	mg/L		08/06/14 15:42	08/07/14 16:08	1
Vanadium	ND		0.010	0.00070	mg/L		08/06/14 15:42	08/07/14 16:08	1
Zinc	**0.010**	**J**	0.020	0.0096	mg/L		08/06/14 15:42	08/07/14 16:08	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/07/14 16:43	08/08/14 11:09	1

Method: SM 2340B - Hardness, Calculation

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness	**50**		1.9	0.98	mg/L			08/12/14 12:51	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-SD-03

Lab Sample ID: 720-59091-7

Date Collected: 07/31/14 11:45
Matrix: Solid
Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.24	J	0.32	0.054	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Arsenic	36		0.65	0.055	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Barium	38		0.32	0.046	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Beryllium	0.032	J	0.065	0.021	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Cadmium	0.22		0.081	0.0081	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Chromium	2.4		0.32	0.034	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Cobalt	2.2		0.13	0.013	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Copper	5.1		0.97	0.46	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Lead	7.0		0.32	0.068	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Molybdenum	0.38		0.32	0.042	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Nickel	3.7		0.32	0.033	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Selenium	0.70	B	0.65	0.097	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Silver	0.66		0.16	0.033	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Thallium	ND		0.32	0.094	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Vanadium	7.5		0.32	0.044	mg/Kg		08/06/14 14:50	08/07/14 10:50	1
Zinc	25		0.97	0.41	mg/Kg		08/06/14 14:50	08/07/14 10:50	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	2.6	B	0.46	0.12	mg/Kg		08/06/14 19:35	08/07/14 18:10	50

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.61		0.100		SU			08/07/14 15:31	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-01

Lab Sample ID: 720-59091-8

Date Collected: 07/31/14 15:15

Matrix: Solid

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	230		1.8	0.30	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Arsenic	19		3.7	0.31	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Barium	210		1.8	0.26	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Beryllium	ND		0.37	0.12	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Cadmium	0.62		0.46	0.046	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Chromium	8.7		1.8	0.19	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Cobalt	17		0.73	0.073	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Copper	190		5.5	2.6	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Lead	2500		1.8	0.39	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Molybdenum	0.83	J	1.8	0.23	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Nickel	34		1.8	0.19	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Selenium	0.80	J B	3.7	0.55	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Silver	5.4		0.92	0.19	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Thallium	ND		1.8	0.53	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Vanadium	25		1.8	0.25	mg/Kg		08/06/14 14:50	08/07/14 00:03	4
Zinc	570		5.5	2.3	mg/Kg		08/06/14 14:50	08/07/14 00:03	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	52	B	0.42	0.11	mg/Kg		08/06/14 19:35	08/07/14 18:18	50

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.01		0.100		SU			08/07/14 15:33	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-02

Lab Sample ID: 720-59091-9

Date Collected: 07/31/14 15:20
Matrix: Solid
Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	4.2		0.45	0.075	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Arsenic	12		0.90	0.077	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Barium	230		0.45	0.064	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Beryllium	0.27		0.090	0.029	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Cadmium	0.15		0.11	0.011	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Chromium	7.0		0.45	0.048	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Cobalt	5.4		0.18	0.018	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Copper	21		1.4	0.64	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Lead	150		0.45	0.095	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Molybdenum	0.37	J	0.45	0.058	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Nickel	16		0.45	0.046	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Selenium	0.17	J B	0.90	0.14	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Silver	3.8		0.23	0.045	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Thallium	ND		0.45	0.13	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Vanadium	24		0.45	0.061	mg/Kg		08/06/14 14:50	08/07/14 10:54	1
Zinc	42		1.4	0.57	mg/Kg		08/06/14 14:50	08/07/14 10:54	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	210	B	4.7	1.2	mg/Kg		08/06/14 19:35	08/07/14 19:09	500

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.60		0.100		SU			08/07/14 15:34	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-03

Lab Sample ID: 720-59091-10

Date Collected: 07/31/14 15:40
Matrix: Solid
Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	25		0.40	0.066	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Arsenic	84		0.80	0.068	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Barium	1000		0.40	0.057	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Beryllium	0.17		0.080	0.026	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Cadmium	2.4		0.10	0.0099	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Chromium	5.5		0.40	0.042	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Cobalt	3.7		0.16	0.016	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Copper	130		1.2	0.57	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Lead	430		0.40	0.084	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Molybdenum	5.3		0.40	0.051	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Nickel	11		0.40	0.041	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Selenium	6.6	B	0.80	0.12	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Silver	85		0.20	0.040	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Thallium	ND		0.40	0.12	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Vanadium	21		0.40	0.054	mg/Kg		08/06/14 14:50	08/07/14 10:59	1
Zinc	150		1.2	0.51	mg/Kg		08/06/14 14:50	08/07/14 10:59	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	260	B	4.5	1.1	mg/Kg		08/06/14 19:35	08/07/14 19:16	500

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.37		0.100		SU			08/07/14 15:36	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-04

Date Collected: 07/31/14 15:45
Date Received: 08/05/14 18:20

Lab Sample ID: 720-59091-11

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	19		0.37	0.061	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Arsenic	36		0.74	0.063	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Barium	950		0.37	0.052	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Beryllium	0.21		0.074	0.024	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Cadmium	1.4		0.092	0.0091	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Chromium	6.2		0.37	0.039	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Cobalt	4.9		0.15	0.015	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Copper	100		1.1	0.52	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Lead	380		0.37	0.077	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Molybdenum	2.6		0.37	0.047	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Nickel	17		0.37	0.038	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Selenium	2.7	B	0.74	0.11	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Silver	64		0.18	0.037	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Thallium	ND		0.37	0.11	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Vanadium	21		0.37	0.050	mg/Kg		08/06/14 14:50	08/07/14 11:04	1
Zinc	110		1.1	0.47	mg/Kg		08/06/14 14:50	08/07/14 11:04	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	2200	B	43	11	mg/Kg		08/06/14 19:35	08/07/14 19:19	5000

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.28		0.100		SU			08/07/14 15:39	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-05

Lab Sample ID: 720-59091-12

Date Collected: 07/31/14 15:55

Matrix: Solid

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.71		0.38	0.062	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Arsenic	9.7		0.75	0.064	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Barium	150		0.38	0.053	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Beryllium	0.24		0.075	0.024	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Cadmium	0.18		0.094	0.0093	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Chromium	6.2		0.38	0.040	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Cobalt	5.6		0.15	0.015	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Copper	12		1.1	0.54	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Lead	18		0.38	0.079	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Molybdenum	0.34	J	0.38	0.048	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Nickel	19		0.38	0.038	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Selenium	ND		0.75	0.11	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Silver	2.6		0.19	0.038	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Thallium	ND		0.38	0.11	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Vanadium	23		0.38	0.051	mg/Kg		08/06/14 14:50	08/07/14 11:09	1
Zinc	48		1.1	0.48	mg/Kg		08/06/14 14:50	08/07/14 11:09	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	2.4	B	0.48	0.12	mg/Kg		08/06/14 19:35	08/07/14 19:21	50

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.98		0.100		SU			08/07/14 15:41	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-06

Date Collected: 07/31/14 16:00
Date Received: 08/05/14 18:20

Lab Sample ID: 720-59091-13

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	23		0.38	0.064	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Arsenic	28		0.77	0.065	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Barium	750		0.38	0.055	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Beryllium	0.17		0.077	0.025	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Cadmium	0.97		0.096	0.0095	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Chromium	6.1		0.38	0.041	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Cobalt	4.9		0.15	0.015	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Copper	58		1.2	0.55	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Lead	600		0.38	0.081	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Molybdenum	0.87		0.38	0.049	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Nickel	15		0.38	0.039	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Selenium	1.2	B	0.77	0.12	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Silver	9.3		0.19	0.039	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Thallium	ND		0.38	0.11	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Vanadium	19		0.38	0.052	mg/Kg		08/06/14 14:50	08/07/14 11:24	1
Zinc	160		1.2	0.49	mg/Kg		08/06/14 14:50	08/07/14 11:24	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	51	B	0.43	0.11	mg/Kg		08/06/14 19:35	08/07/14 18:28	50

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.51		0.100		SU			08/07/14 15:48	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-07

Date Collected: 07/31/14 16:15
Date Received: 08/05/14 18:20

Lab Sample ID: 720-59091-14

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	1.0		0.42	0.069	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Arsenic	11		0.83	0.071	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Barium	220		0.42	0.059	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Beryllium	0.20		0.083	0.027	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Cadmium	0.31		0.10	0.010	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Chromium	9.4		0.42	0.044	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Cobalt	6.0		0.17	0.017	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Copper	95		1.3	0.59	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Lead	39		0.42	0.088	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Molybdenum	0.46		0.42	0.053	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Nickel	21		0.42	0.043	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Selenium	0.34	J B	0.83	0.13	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Silver	2.2		0.21	0.042	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Thallium	ND		0.42	0.12	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Vanadium	29		0.42	0.057	mg/Kg		08/06/14 14:50	08/07/14 11:29	1
Zinc	55		1.3	0.53	mg/Kg		08/06/14 14:50	08/07/14 11:29	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	58	B	0.47	0.12	mg/Kg		08/06/14 19:35	08/07/14 18:31	50

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.47		0.100		SU			08/07/14 15:54	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-08

Lab Sample ID: 720-59091-15

Date Collected: 07/31/14 16:25

Matrix: Solid

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	4.0		0.45	0.075	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Arsenic	15		0.90	0.077	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Barium	240		0.45	0.064	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Beryllium	0.12		0.090	0.029	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Cadmium	0.99		0.11	0.011	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Chromium	6.4		0.45	0.048	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Cobalt	5.7		0.18	0.018	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Copper	69		1.4	0.64	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Lead	220		0.45	0.095	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Molybdenum	1.5		0.45	0.058	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Nickel	16		0.45	0.046	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Selenium	0.61	J B	0.90	0.14	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Silver	8.0		0.23	0.045	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Thallium	ND		0.45	0.13	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Vanadium	22		0.45	0.061	mg/Kg		08/06/14 14:50	08/07/14 11:34	1
Zinc	120		1.4	0.57	mg/Kg		08/06/14 14:50	08/07/14 11:34	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	31	B	0.46	0.12	mg/Kg		08/06/14 19:35	08/07/14 18:33	50

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.38		0.100		SU			08/07/14 15:56	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-09

Lab Sample ID: 720-59091-16

Date Collected: 07/31/14 16:30
Matrix: Solid
Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	35		1.7	0.29	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Arsenic	210		3.5	0.30	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Barium	1300		1.7	0.25	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Beryllium	0.12	J	0.35	0.11	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Cadmium	1.5		0.43	0.043	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Chromium	3.8		1.7	0.18	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Cobalt	1.1		0.70	0.070	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Copper	240		5.2	2.5	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Lead	750		1.7	0.37	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Molybdenum	21		1.7	0.22	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Nickel	2.3		1.7	0.18	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Selenium	14	B	3.5	0.52	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Silver	140		0.87	0.18	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Thallium	ND		1.7	0.50	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Vanadium	21		1.7	0.24	mg/Kg		08/06/14 14:50	08/07/14 00:51	4
Zinc	370		5.2	2.2	mg/Kg		08/06/14 14:50	08/07/14 00:51	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	27	B	0.44	0.11	mg/Kg		08/06/14 19:35	08/07/14 18:35	50

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.90		0.100		SU			08/07/14 15:58	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-10

Lab Sample ID: 720-59091-17

Date Collected: 07/31/14 16:45

Matrix: Solid

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	5.1		0.43	0.072	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Arsenic	12		0.86	0.073	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Barium	250		0.43	0.061	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Beryllium	0.20		0.086	0.028	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Cadmium	1.0		0.11	0.011	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Chromium	7.1		0.43	0.046	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Cobalt	6.1		0.17	0.017	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Copper	59		1.3	0.61	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Lead	180		0.43	0.091	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Molybdenum	0.55		0.43	0.055	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Nickel	21		0.43	0.044	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Selenium	0.57	J B	0.86	0.13	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Silver	6.8		0.22	0.044	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Thallium	ND		0.43	0.13	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Vanadium	22		0.43	0.059	mg/Kg		08/06/14 14:50	08/07/14 11:38	1
Zinc	100		1.3	0.55	mg/Kg		08/06/14 14:50	08/07/14 11:38	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	150	B	4.6	1.2	mg/Kg		08/06/14 19:35	08/07/14 19:24	500

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.23		0.100		SU			08/07/14 16:00	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-11

Lab Sample ID: 720-59091-18

Date Collected: 07/31/14 16:50
Matrix: Solid
Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.28	J	0.47	0.078	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Arsenic	4.4		0.93	0.079	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Barium	160		0.47	0.066	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Beryllium	0.16		0.093	0.030	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Cadmium	0.25		0.12	0.012	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Chromium	4.7		0.47	0.050	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Cobalt	4.2		0.19	0.019	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Copper	8.3		1.4	0.67	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Lead	9.9		0.47	0.098	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Molybdenum	0.45	J	0.47	0.060	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Nickel	9.0		0.47	0.048	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Selenium	0.14	J B	0.93	0.14	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Silver	0.58		0.23	0.047	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Thallium	ND		0.47	0.14	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Vanadium	13		0.47	0.064	mg/Kg		08/06/14 14:50	08/07/14 11:43	1
Zinc	43		1.4	0.59	mg/Kg		08/06/14 14:50	08/07/14 11:43	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.98	B	0.045	0.011	mg/Kg		08/06/14 19:35	08/07/14 19:27	5

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.25		0.100		SU			08/07/14 16:02	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-12

Lab Sample ID: 720-59091-19

Date Collected: 07/31/14 17:00
Matrix: Solid
Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.55		0.45	0.075	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Arsenic	9.1		0.91	0.077	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Barium	140		0.45	0.065	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Beryllium	0.19		0.091	0.030	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Cadmium	0.48		0.11	0.011	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Chromium	5.6		0.45	0.048	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Cobalt	4.5		0.18	0.018	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Copper	17		1.4	0.65	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Lead	17		0.45	0.095	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Molybdenum	0.69		0.45	0.058	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Nickel	13		0.45	0.046	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Selenium	0.38	J B	0.91	0.14	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Silver	2.7		0.23	0.046	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Thallium	ND		0.45	0.13	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Vanadium	19		0.45	0.062	mg/Kg		08/06/14 14:50	08/07/14 11:48	1
Zinc	63		1.4	0.58	mg/Kg		08/06/14 14:50	08/07/14 11:48	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	18	B	0.42	0.11	mg/Kg		08/06/14 19:35	08/07/14 18:47	50

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.14		0.100		SU			08/07/14 16:05	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-13

Lab Sample ID: 720-59091-20

Date Collected: 07/31/14 17:10

Matrix: Solid

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.19	J B	0.44	0.073	mg/Kg		08/06/14 15:32	08/07/14 12:23	1
Arsenic	4.0		0.88	0.075	mg/Kg		08/06/14 15:32	08/07/14 12:23	1
Barium	100		0.44	0.063	mg/Kg		08/06/14 15:32	08/12/14 11:35	1
Beryllium	0.12		0.088	0.029	mg/Kg		08/06/14 15:32	08/07/14 12:23	1
Cadmium	0.35		0.11	0.011	mg/Kg		08/06/14 15:32	08/07/14 12:23	1
Chromium	7.4		0.44	0.047	mg/Kg		08/06/14 15:32	08/07/14 12:23	1
Cobalt	4.5		0.18	0.018	mg/Kg		08/06/14 15:32	08/12/14 11:35	1
Copper	9.1		1.3	0.63	mg/Kg		08/06/14 15:32	08/07/14 12:23	1
Lead	44		0.44	0.093	mg/Kg		08/06/14 15:32	08/07/14 12:23	1
Molybdenum	0.55	B	0.44	0.057	mg/Kg		08/06/14 15:32	08/07/14 12:23	1
Nickel	8.7		0.44	0.045	mg/Kg		08/06/14 15:32	08/07/14 12:23	1
Selenium	0.17	J	0.88	0.13	mg/Kg		08/06/14 15:32	08/07/14 12:23	1
Silver	0.43		0.22	0.045	mg/Kg		08/06/14 15:32	08/07/14 12:23	1
Thallium	ND		0.44	0.13	mg/Kg		08/06/14 15:32	08/07/14 12:23	1
Vanadium	14		0.44	0.060	mg/Kg		08/06/14 15:32	08/07/14 12:23	1
Zinc	63		1.3	0.56	mg/Kg		08/06/14 15:32	08/07/14 12:23	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	3.9	B	0.42	0.11	mg/Kg		08/06/14 19:35	08/07/14 18:49	50

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	4.89		0.100		SU			08/07/14 16:07	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-14

Lab Sample ID: 720-59091-21

Date Collected: 07/31/14 17:25

Matrix: Solid

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	1.0	B	0.35	0.058	mg/Kg		08/06/14 15:32	08/07/14 12:28	1
Arsenic	26		0.69	0.059	mg/Kg		08/06/14 15:32	08/07/14 12:28	1
Barium	120		0.35	0.049	mg/Kg		08/06/14 15:32	08/12/14 11:40	1
Beryllium	ND		0.069	0.023	mg/Kg		08/06/14 15:32	08/07/14 12:28	1
Cadmium	0.39		0.087	0.0086	mg/Kg		08/06/14 15:32	08/07/14 12:28	1
Chromium	6.4		0.35	0.037	mg/Kg		08/06/14 15:32	08/07/14 12:28	1
Cobalt	3.8		0.14	0.014	mg/Kg		08/06/14 15:32	08/12/14 11:40	1
Copper	12		1.0	0.49	mg/Kg		08/06/14 15:32	08/07/14 12:28	1
Lead	32		0.35	0.073	mg/Kg		08/06/14 15:32	08/07/14 12:28	1
Molybdenum	0.42	B	0.35	0.044	mg/Kg		08/06/14 15:32	08/07/14 12:28	1
Nickel	8.5		0.35	0.035	mg/Kg		08/06/14 15:32	08/07/14 12:28	1
Selenium	0.44	J	0.69	0.10	mg/Kg		08/06/14 15:32	08/07/14 12:28	1
Silver	7.7		0.17	0.035	mg/Kg		08/06/14 15:32	08/07/14 12:28	1
Thallium	ND		0.35	0.10	mg/Kg		08/06/14 15:32	08/07/14 12:28	1
Vanadium	27		0.35	0.047	mg/Kg		08/06/14 15:32	08/07/14 12:28	1
Zinc	46		1.0	0.44	mg/Kg		08/06/14 15:32	08/07/14 12:28	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	23	B	0.47	0.12	mg/Kg		08/06/14 19:35	08/07/14 18:52	50

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.21		0.100		SU			08/07/14 16:09	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-15

Lab Sample ID: 720-59091-22

Date Collected: 07/31/14 17:35

Matrix: Solid

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.43	0.072	mg/Kg		08/06/14 15:32	08/07/14 12:32	1
Arsenic	**3.3**		0.86	0.073	mg/Kg		08/06/14 15:32	08/07/14 12:32	1
Barium	**49**		0.43	0.061	mg/Kg		08/06/14 15:32	08/12/14 11:44	1
Beryllium	**0.11**		0.086	0.028	mg/Kg		08/06/14 15:32	08/07/14 12:32	1
Cadmium	**0.071**	**J**	0.11	0.011	mg/Kg		08/06/14 15:32	08/07/14 12:32	1
Chromium	**6.0**		0.43	0.046	mg/Kg		08/06/14 15:32	08/07/14 12:32	1
Cobalt	**4.3**		0.17	0.017	mg/Kg		08/06/14 15:32	08/12/14 11:44	1
Copper	**5.2**		1.3	0.61	mg/Kg		08/06/14 15:32	08/07/14 12:32	1
Lead	**2.7**		0.43	0.091	mg/Kg		08/06/14 15:32	08/07/14 12:32	1
Molybdenum	**0.30**	**J B**	0.43	0.055	mg/Kg		08/06/14 15:32	08/07/14 12:32	1
Nickel	**16**		0.43	0.044	mg/Kg		08/06/14 15:32	08/07/14 12:32	1
Selenium	ND		0.86	0.13	mg/Kg		08/06/14 15:32	08/07/14 12:32	1
Silver	**0.064**	**J**	0.22	0.044	mg/Kg		08/06/14 15:32	08/07/14 12:32	1
Thallium	ND		0.43	0.13	mg/Kg		08/06/14 15:32	08/07/14 12:32	1
Vanadium	**20**		0.43	0.059	mg/Kg		08/06/14 15:32	08/07/14 12:32	1
Zinc	**24**		1.3	0.55	mg/Kg		08/06/14 15:32	08/07/14 12:32	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.54**	**B**	0.0090	0.0022	mg/Kg		08/06/14 19:35	08/07/14 19:34	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.58**		0.100		SU			08/07/14 16:10	1

QC Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 720-164478/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 164527 — **Prep Batch: 164478**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.50	0.083	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Arsenic	ND		1.0	0.085	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Barium	ND		0.50	0.071	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Beryllium	ND		0.10	0.033	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Cadmium	ND		0.13	0.012	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Chromium	ND		0.50	0.053	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Cobalt	ND		0.20	0.020	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Copper	ND		1.5	0.71	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Lead	ND		0.50	0.11	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Molybdenum	ND		0.50	0.064	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Nickel	ND		0.50	0.051	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Selenium	0.159	J	1.0	0.15	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Silver	ND		0.25	0.051	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Thallium	ND		0.50	0.15	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Vanadium	ND		0.50	0.068	mg/Kg		08/06/14 13:39	08/06/14 22:51	1
Zinc	ND		1.5	0.64	mg/Kg		08/06/14 13:39	08/06/14 22:51	1

Lab Sample ID: LCS 720-164478/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 164527 — **Prep Batch: 164478**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	50.0	43.4		mg/Kg		87	80 - 120
Arsenic	50.0	45.4		mg/Kg		91	80 - 120
Barium	50.0	47.1		mg/Kg		94	80 - 120
Beryllium	50.0	45.9		mg/Kg		92	80 - 120
Cadmium	50.0	45.7		mg/Kg		91	80 - 120
Chromium	50.0	46.6		mg/Kg		93	80 - 120
Cobalt	50.0	47.2		mg/Kg		94	80 - 120
Copper	50.0	46.0		mg/Kg		92	80 - 120
Lead	50.0	46.4		mg/Kg		93	80 - 120
Molybdenum	50.0	46.4		mg/Kg		93	80 - 120
Nickel	50.0	46.3		mg/Kg		93	80 - 120
Selenium	50.0	44.8		mg/Kg		90	80 - 120
Silver	25.0	23.1		mg/Kg		93	80 - 120
Thallium	50.0	47.1		mg/Kg		94	80 - 120
Vanadium	50.0	45.8		mg/Kg		92	80 - 120
Zinc	50.0	43.4		mg/Kg		87	80 - 120

Lab Sample ID: LCSD 720-164478/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 164527 — **Prep Batch: 164478**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	50.0	44.2		mg/Kg		88	80 - 120	2	20
Arsenic	50.0	45.5		mg/Kg		91	80 - 120	0	20
Barium	50.0	47.3		mg/Kg		95	80 - 120	0	20
Beryllium	50.0	45.5		mg/Kg		91	80 - 120	1	20

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCSD 720-164478/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 164527 — **Prep Batch: 164478**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cadmium	50.0	45.9		mg/Kg		92	80 - 120	0	20
Chromium	50.0	46.4		mg/Kg		93	80 - 120	0	20
Cobalt	50.0	47.3		mg/Kg		95	80 - 120	0	20
Copper	50.0	46.2		mg/Kg		92	80 - 120	0	20
Lead	50.0	46.3		mg/Kg		93	80 - 120	0	20
Molybdenum	50.0	46.5		mg/Kg		93	80 - 120	0	20
Nickel	50.0	46.2		mg/Kg		92	80 - 120	0	20
Selenium	50.0	45.2		mg/Kg		90	80 - 120	1	20
Silver	25.0	23.2		mg/Kg		93	80 - 120	0	20
Thallium	50.0	46.6		mg/Kg		93	80 - 120	1	20
Vanadium	50.0	45.2		mg/Kg		90	80 - 120	1	20
Zinc	50.0	43.3		mg/Kg		87	80 - 120	0	20

Lab Sample ID: LCSSRM 720-164478/25-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 164527 — **Prep Batch: 164478**

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	74.6	38.5		mg/Kg		52	11 - 101
Arsenic	45.5	42.5		mg/Kg		94	69 - 119
Barium	579	476		mg/Kg		82	61 - 117
Beryllium	155	142		mg/Kg		91	56 - 102
Cadmium	201	179		mg/Kg		89	67 - 118
Chromium	106	93.9		mg/Kg		89	67 - 121
Cobalt	247	223		mg/Kg		90	64 - 133
Copper	130	120		mg/Kg		92	68 - 126
Lead	302	264		mg/Kg		87	62 - 113
Molybdenum	165	146		mg/Kg		89	62 - 128
Nickel	305	270		mg/Kg		89	65 - 117
Selenium	133	125		mg/Kg		94	63 - 126
Silver	33.5	30.3		mg/Kg		90	51 - 130
Thallium	191	169		mg/Kg		88	64 - 124
Vanadium	214	193		mg/Kg		90	67 - 123
Zinc	388	351		mg/Kg		90	62 - 110

Lab Sample ID: MB 720-164490/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 164528 — **Prep Batch: 164490**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.134	J	0.50	0.083	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Arsenic	ND		1.0	0.085	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Barium	ND		0.50	0.071	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Beryllium	ND		0.10	0.033	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Cadmium	ND		0.13	0.012	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Chromium	ND		0.50	0.053	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Cobalt	ND		0.20	0.020	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Copper	ND		1.5	0.71	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Lead	ND		0.50	0.11	mg/Kg		08/06/14 15:32	08/07/14 01:20	1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: MB 720-164490/1-A
Matrix: Solid
Analysis Batch: 164528

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 164490

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Molybdenum	0.223	J	0.50	0.064	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Nickel	ND		0.50	0.051	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Selenium	ND		1.0	0.15	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Silver	ND		0.25	0.051	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Thallium	ND		0.50	0.15	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Vanadium	ND		0.50	0.068	mg/Kg		08/06/14 15:32	08/07/14 01:20	1
Zinc	ND		1.5	0.64	mg/Kg		08/06/14 15:32	08/07/14 01:20	1

Lab Sample ID: LCS 720-164490/2-A
Matrix: Solid
Analysis Batch: 164528

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 164490

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	50.0	43.0		mg/Kg		86	80 - 120
Arsenic	50.0	47.3		mg/Kg		95	80 - 120
Barium	50.0	46.8		mg/Kg		94	80 - 120
Beryllium	50.0	47.1		mg/Kg		94	80 - 120
Cadmium	50.0	46.1		mg/Kg		92	80 - 120
Chromium	50.0	47.1		mg/Kg		94	80 - 120
Cobalt	50.0	47.1		mg/Kg		94	80 - 120
Copper	50.0	46.7		mg/Kg		93	80 - 120
Lead	50.0	48.0		mg/Kg		96	80 - 120
Molybdenum	50.0	48.1		mg/Kg		96	80 - 120
Nickel	50.0	47.0		mg/Kg		94	80 - 120
Selenium	50.0	46.5		mg/Kg		93	80 - 120
Silver	25.0	22.7		mg/Kg		91	80 - 120
Thallium	50.0	48.4		mg/Kg		97	80 - 120
Vanadium	50.0	47.1		mg/Kg		94	80 - 120
Zinc	50.0	45.1		mg/Kg		90	80 - 120

Lab Sample ID: LCSD 720-164490/3-A
Matrix: Solid
Analysis Batch: 164528

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 164490

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	50.0	44.1		mg/Kg		88	80 - 120	2	20
Arsenic	50.0	47.4		mg/Kg		95	80 - 120	0	20
Barium	50.0	46.9		mg/Kg		94	80 - 120	0	20
Beryllium	50.0	47.3		mg/Kg		95	80 - 120	0	20
Cadmium	50.0	46.2		mg/Kg		92	80 - 120	0	20
Chromium	50.0	47.1		mg/Kg		94	80 - 120	0	20
Cobalt	50.0	47.2		mg/Kg		94	80 - 120	0	20
Copper	50.0	46.9		mg/Kg		94	80 - 120	0	20
Lead	50.0	48.0		mg/Kg		96	80 - 120	0	20
Molybdenum	50.0	48.3		mg/Kg		97	80 - 120	0	20
Nickel	50.0	47.1		mg/Kg		94	80 - 120	0	20
Selenium	50.0	46.7		mg/Kg		93	80 - 120	0	20
Silver	25.0	22.9		mg/Kg		92	80 - 120	1	20
Thallium	50.0	48.6		mg/Kg		97	80 - 120	0	20

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCSD 720-164490/3-A
Matrix: Solid
Analysis Batch: 164528

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 164490

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vanadium	50.0	47.2		mg/Kg		94	80 - 120	0	20
Zinc	50.0	45.3		mg/Kg		91	80 - 120	0	20

Lab Sample ID: LCSSRM 720-164490/14-A
Matrix: Solid
Analysis Batch: 164528

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 164490

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	74.6	42.7		mg/Kg		57	11 - 101
Arsenic	45.5	44.6		mg/Kg		98	69 - 119
Barium	579	537		mg/Kg		93	61 - 117
Beryllium	155	148		mg/Kg		96	56 - 102
Cadmium	201	189		mg/Kg		94	67 - 118
Chromium	106	100		mg/Kg		95	67 - 121
Cobalt	247	236		mg/Kg		96	64 - 133
Copper	130	125		mg/Kg		97	68 - 126
Lead	302	281		mg/Kg		93	62 - 113
Molybdenum	165	156		mg/Kg		94	62 - 128
Nickel	305	286		mg/Kg		94	65 - 117
Selenium	133	132		mg/Kg		99	63 - 126
Silver	33.5	31.7		mg/Kg		95	51 - 130
Thallium	191	181		mg/Kg		95	64 - 124
Vanadium	214	207		mg/Kg		97	67 - 123
Zinc	388	372		mg/Kg		96	62 - 110

Lab Sample ID: MB 720-164491/1-A
Matrix: Water
Analysis Batch: 164584

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 164491

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010	0.0027	mg/L		08/06/14 15:42	08/07/14 15:27	1
Arsenic	ND		0.010	0.0026	mg/L		08/06/14 15:42	08/07/14 15:27	1
Barium	ND		0.0050	0.0014	mg/L		08/06/14 15:42	08/07/14 15:27	1
Beryllium	ND		0.0020	0.00033	mg/L		08/06/14 15:42	08/07/14 15:27	1
Cadmium	ND		0.0025	0.0013	mg/L		08/06/14 15:42	08/07/14 15:27	1
Chromium	ND		0.010	0.0015	mg/L		08/06/14 15:42	08/07/14 15:27	1
Cobalt	ND		0.0020	0.0012	mg/L		08/06/14 15:42	08/07/14 15:27	1
Copper	ND		0.020	0.0015	mg/L		08/06/14 15:42	08/07/14 15:27	1
Lead	ND		0.0050	0.0023	mg/L		08/06/14 15:42	08/07/14 15:27	1
Molybdenum	ND		0.010	0.0023	mg/L		08/06/14 15:42	08/07/14 15:27	1
Nickel	ND		0.010	0.00080	mg/L		08/06/14 15:42	08/07/14 15:27	1
Selenium	ND		0.020	0.0071	mg/L		08/06/14 15:42	08/07/14 15:27	1
Silver	ND		0.0050	0.0012	mg/L		08/06/14 15:42	08/07/14 15:27	1
Thallium	ND		0.010	0.0035	mg/L		08/06/14 15:42	08/07/14 15:27	1
Vanadium	ND		0.010	0.00070	mg/L		08/06/14 15:42	08/07/14 15:27	1
Zinc	ND		0.020	0.0096	mg/L		08/06/14 15:42	08/07/14 15:27	1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCS 720-164491/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164584 — **Prep Batch: 164491**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	1.00	0.881		mg/L		88	80 - 120
Arsenic	1.00	0.894		mg/L		89	80 - 120
Barium	1.00	0.926		mg/L		93	80 - 120
Beryllium	1.00	0.896		mg/L		90	80 - 120
Cadmium	1.00	0.894		mg/L		89	80 - 120
Chromium	1.00	0.908		mg/L		91	80 - 120
Cobalt	1.00	0.930		mg/L		93	80 - 120
Copper	1.00	0.903		mg/L		90	80 - 120
Lead	1.00	0.915		mg/L		91	80 - 120
Molybdenum	1.00	0.940		mg/L		94	80 - 120
Nickel	1.00	0.917		mg/L		92	80 - 120
Selenium	1.00	0.872		mg/L		87	80 - 120
Silver	0.500	0.450		mg/L		90	80 - 120
Thallium	1.00	0.928		mg/L		93	80 - 120
Vanadium	1.00	0.907		mg/L		91	80 - 120
Zinc	1.00	0.850		mg/L		85	80 - 120

Lab Sample ID: LCSD 720-164491/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164584 — **Prep Batch: 164491**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	1.00	0.897		mg/L		90	80 - 120	2	20
Arsenic	1.00	0.904		mg/L		90	80 - 120	1	20
Barium	1.00	0.939		mg/L		94	80 - 120	1	20
Beryllium	1.00	0.916		mg/L		92	80 - 120	2	20
Cadmium	1.00	0.898		mg/L		90	80 - 120	0	20
Chromium	1.00	0.918		mg/L		92	80 - 120	1	20
Cobalt	1.00	0.936		mg/L		94	80 - 120	1	20
Copper	1.00	0.913		mg/L		91	80 - 120	1	20
Lead	1.00	0.915		mg/L		92	80 - 120	0	20
Molybdenum	1.00	0.951		mg/L		95	80 - 120	1	20
Nickel	1.00	0.918		mg/L		92	80 - 120	0	20
Selenium	1.00	0.894		mg/L		89	80 - 120	2	20
Silver	0.500	0.450		mg/L		90	80 - 120	0	20
Thallium	1.00	0.933		mg/L		93	80 - 120	1	20
Vanadium	1.00	0.908		mg/L		91	80 - 120	0	20
Zinc	1.00	0.855		mg/L		86	80 - 120	1	20

Lab Sample ID: 720-59091-1 MS — **Client Sample ID: MM-SW-01**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164584 — **Prep Batch: 164491**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		1.00	0.897		mg/L		90	75 - 125
Arsenic	0.035		1.00	0.947		mg/L		91	75 - 125
Barium	0.011		1.00	0.962		mg/L		95	75 - 125
Beryllium	ND		1.00	0.919		mg/L		92	75 - 125

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: 720-59091-1 MS — **Client Sample ID: MM-SW-01**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164584 — **Prep Batch: 164491**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	ND		1.00	0.894		mg/L		89	75 - 125
Chromium	ND		1.00	0.922		mg/L		92	75 - 125
Cobalt	ND		1.00	0.922		mg/L		92	75 - 125
Copper	ND		1.00	0.920		mg/L		92	75 - 125
Lead	0.0085		1.00	0.921		mg/L		91	75 - 125
Molybdenum	0.0026	J	1.00	0.959		mg/L		96	75 - 125
Nickel	ND		1.00	0.912		mg/L		91	75 - 125
Selenium	ND		1.00	0.887		mg/L		89	75 - 125
Silver	ND		0.500	0.459		mg/L		92	75 - 125
Thallium	ND		1.00	0.925		mg/L		92	75 - 125
Vanadium	ND		1.00	0.933		mg/L		93	75 - 125
Zinc	ND		1.00	0.853		mg/L		85	75 - 125

Lab Sample ID: 720-59091-1 MSD — **Client Sample ID: MM-SW-01**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164584 — **Prep Batch: 164491**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		1.00	0.898		mg/L		90	75 - 125	0	20
Arsenic	0.035		1.00	0.948		mg/L		91	75 - 125	0	20
Barium	0.011		1.00	0.953		mg/L		94	75 - 125	1	20
Beryllium	ND		1.00	0.913		mg/L		91	75 - 125	1	20
Cadmium	ND		1.00	0.893		mg/L		89	75 - 125	0	20
Chromium	ND		1.00	0.918		mg/L		92	75 - 125	0	20
Cobalt	ND		1.00	0.924		mg/L		92	75 - 125	0	20
Copper	ND		1.00	0.916		mg/L		92	75 - 125	0	20
Lead	0.0085		1.00	0.914		mg/L		91	75 - 125	1	20
Molybdenum	0.0026	J	1.00	0.953		mg/L		95	75 - 125	1	20
Nickel	ND		1.00	0.904		mg/L		90	75 - 125	1	20
Selenium	ND		1.00	0.894		mg/L		89	75 - 125	1	20
Silver	ND		0.500	0.453		mg/L		91	75 - 125	1	20
Thallium	ND		1.00	0.919		mg/L		92	75 - 125	1	20
Vanadium	ND		1.00	0.918		mg/L		92	75 - 125	2	20
Zinc	ND		1.00	0.853		mg/L		85	75 - 125	0	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 720-164585/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164623 — **Prep Batch: 164585**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/07/14 16:43	08/08/14 10:36	1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 720-164585/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164623 — **Prep Batch: 164585**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.0100	0.00982		mg/L		98	85 - 115

Lab Sample ID: LCSD 720-164585/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 164623 — **Prep Batch: 164585**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.0100	0.00986		mg/L		99	85 - 115	0	20

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 720-164507/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 164592 — **Prep Batch: 164507**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.00308	J	0.010	0.0025	mg/Kg		08/06/14 19:35	08/07/14 17:48	1

Lab Sample ID: LCS 720-164507/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 164592 — **Prep Batch: 164507**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.833	0.867		mg/Kg		104	80 - 120

Lab Sample ID: LCSD 720-164507/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 164592 — **Prep Batch: 164507**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.833	0.867		mg/Kg		104	80 - 120	0	20

Lab Sample ID: 720-59091-9 MS — **Client Sample ID: MM-S-02**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 164592 — **Prep Batch: 164507**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	210	B	0.769	269	4	mg/Kg		7274	75 - 125

Lab Sample ID: 720-59091-9 MSD — **Client Sample ID: MM-S-02**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 164592 — **Prep Batch: 164507**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	210	B	0.781	277	4	mg/Kg		8250	75 - 125	3	20

QC Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Method: SM 2340B - Hardness, Calculation

Lab Sample ID: MB 720-164782/1
Matrix: Water
Analysis Batch: 164782

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness	ND		1.9	0.98	mg/L			08/12/14 12:51	1

Method: 9045C - pH

Lab Sample ID: LCS 720-164576/1
Matrix: Solid
Analysis Batch: 164576

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	6.920		SU		99	99 - 101		

Lab Sample ID: 720-59091-2 DU
Matrix: Solid
Analysis Batch: 164576

Client Sample ID: MM-SD-01
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.42			6.520		SU				2	20

Metals

Prep Batch: 164478

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-2	MM-SD-01	Total/NA	Solid	3050B	
720-59091-3	MM-BG-01	Total/NA	Solid	3050B	
720-59091-5	MM-SD-02	Total/NA	Solid	3050B	
720-59091-7	MM-SD-03	Total/NA	Solid	3050B	
720-59091-8	MM-S-01	Total/NA	Solid	3050B	
720-59091-9	MM-S-02	Total/NA	Solid	3050B	
720-59091-10	MM-S-03	Total/NA	Solid	3050B	
720-59091-11	MM-S-04	Total/NA	Solid	3050B	
720-59091-12	MM-S-05	Total/NA	Solid	3050B	
720-59091-13	MM-S-06	Total/NA	Solid	3050B	
720-59091-14	MM-S-07	Total/NA	Solid	3050B	
720-59091-15	MM-S-08	Total/NA	Solid	3050B	
720-59091-16	MM-S-09	Total/NA	Solid	3050B	
720-59091-17	MM-S-10	Total/NA	Solid	3050B	
720-59091-18	MM-S-11	Total/NA	Solid	3050B	
720-59091-19	MM-S-12	Total/NA	Solid	3050B	
LCS 720-164478/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 720-164478/3-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
LCSSRM 720-164478/25-A	Lab Control Sample	Total/NA	Solid	3050B	
MB 720-164478/1-A	Method Blank	Total/NA	Solid	3050B	

Prep Batch: 164490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-20	MM-S-13	Total/NA	Solid	3050B	
720-59091-21	MM-S-14	Total/NA	Solid	3050B	
720-59091-22	MM-S-15	Total/NA	Solid	3050B	
LCS 720-164490/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 720-164490/3-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
LCSSRM 720-164490/14-A	Lab Control Sample	Total/NA	Solid	3050B	
MB 720-164490/1-A	Method Blank	Total/NA	Solid	3050B	

Prep Batch: 164491

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-1	MM-SW-01	Total/NA	Water	3010A	
720-59091-1 MS	MM-SW-01	Total/NA	Water	3010A	
720-59091-1 MSD	MM-SW-01	Total/NA	Water	3010A	
720-59091-4	MM-SW-02	Total/NA	Water	3010A	
720-59091-6	MM-SW-03	Total/NA	Water	3010A	
LCS 720-164491/2-A	Lab Control Sample	Total/NA	Water	3010A	
LCSD 720-164491/3-A	Lab Control Sample Dup	Total/NA	Water	3010A	
MB 720-164491/1-A	Method Blank	Total/NA	Water	3010A	

Prep Batch: 164507

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-2	MM-SD-01	Total/NA	Solid	7471A	
720-59091-3	MM-BG-01	Total/NA	Solid	7471A	
720-59091-5	MM-SD-02	Total/NA	Solid	7471A	
720-59091-7	MM-SD-03	Total/NA	Solid	7471A	
720-59091-8	MM-S-01	Total/NA	Solid	7471A	
720-59091-9	MM-S-02	Total/NA	Solid	7471A	
720-59091-9 MS	MM-S-02	Total/NA	Solid	7471A	

Metals (Continued)

Prep Batch: 164507 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-9 MSD	MM-S-02	Total/NA	Solid	7471A	
720-59091-10	MM-S-03	Total/NA	Solid	7471A	
720-59091-11	MM-S-04	Total/NA	Solid	7471A	
720-59091-12	MM-S-05	Total/NA	Solid	7471A	
720-59091-13	MM-S-06	Total/NA	Solid	7471A	
720-59091-14	MM-S-07	Total/NA	Solid	7471A	
720-59091-15	MM-S-08	Total/NA	Solid	7471A	
720-59091-16	MM-S-09	Total/NA	Solid	7471A	
720-59091-17	MM-S-10	Total/NA	Solid	7471A	
720-59091-18	MM-S-11	Total/NA	Solid	7471A	
720-59091-19	MM-S-12	Total/NA	Solid	7471A	
720-59091-20	MM-S-13	Total/NA	Solid	7471A	
720-59091-21	MM-S-14	Total/NA	Solid	7471A	
720-59091-22	MM-S-15	Total/NA	Solid	7471A	
LCS 720-164507/2-A	Lab Control Sample	Total/NA	Solid	7471A	
LCSD 720-164507/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	
MB 720-164507/1-A	Method Blank	Total/NA	Solid	7471A	

Analysis Batch: 164527

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-8	MM-S-01	Total/NA	Solid	6010B	164478
720-59091-16	MM-S-09	Total/NA	Solid	6010B	164478
LCS 720-164478/2-A	Lab Control Sample	Total/NA	Solid	6010B	164478
LCSD 720-164478/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	164478
LCSSRM 720-164478/25-A	Lab Control Sample	Total/NA	Solid	6010B	164478
MB 720-164478/1-A	Method Blank	Total/NA	Solid	6010B	164478

Analysis Batch: 164528

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 720-164490/2-A	Lab Control Sample	Total/NA	Solid	6010B	164490
LCSD 720-164490/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	164490
LCSSRM 720-164490/14-A	Lab Control Sample	Total/NA	Solid	6010B	164490
MB 720-164490/1-A	Method Blank	Total/NA	Solid	6010B	164490

Analysis Batch: 164564

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-2	MM-SD-01	Total/NA	Solid	6010B	164478
720-59091-3	MM-BG-01	Total/NA	Solid	6010B	164478
720-59091-5	MM-SD-02	Total/NA	Solid	6010B	164478
720-59091-7	MM-SD-03	Total/NA	Solid	6010B	164478
720-59091-9	MM-S-02	Total/NA	Solid	6010B	164478
720-59091-10	MM-S-03	Total/NA	Solid	6010B	164478
720-59091-11	MM-S-04	Total/NA	Solid	6010B	164478
720-59091-12	MM-S-05	Total/NA	Solid	6010B	164478
720-59091-13	MM-S-06	Total/NA	Solid	6010B	164478
720-59091-14	MM-S-07	Total/NA	Solid	6010B	164478
720-59091-15	MM-S-08	Total/NA	Solid	6010B	164478
720-59091-17	MM-S-10	Total/NA	Solid	6010B	164478
720-59091-18	MM-S-11	Total/NA	Solid	6010B	164478
720-59091-19	MM-S-12	Total/NA	Solid	6010B	164478

Metals (Continued)

Analysis Batch: 164565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-20	MM-S-13	Total/NA	Solid	6010B	164490
720-59091-21	MM-S-14	Total/NA	Solid	6010B	164490
720-59091-22	MM-S-15	Total/NA	Solid	6010B	164490

Analysis Batch: 164584

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-1	MM-SW-01	Total/NA	Water	6010B	164491
720-59091-1 MS	MM-SW-01	Total/NA	Water	6010B	164491
720-59091-1 MSD	MM-SW-01	Total/NA	Water	6010B	164491
720-59091-4	MM-SW-02	Total/NA	Water	6010B	164491
720-59091-6	MM-SW-03	Total/NA	Water	6010B	164491
LCS 720-164491/2-A	Lab Control Sample	Total/NA	Water	6010B	164491
LCSD 720-164491/3-A	Lab Control Sample Dup	Total/NA	Water	6010B	164491
MB 720-164491/1-A	Method Blank	Total/NA	Water	6010B	164491

Prep Batch: 164585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-1	MM-SW-01	Total/NA	Water	7470A	
720-59091-4	MM-SW-02	Total/NA	Water	7470A	
720-59091-6	MM-SW-03	Total/NA	Water	7470A	
LCS 720-164585/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 720-164585/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	
MB 720-164585/1-A	Method Blank	Total/NA	Water	7470A	

Analysis Batch: 164592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-2	MM-SD-01	Total/NA	Solid	7471A	164507
720-59091-3	MM-BG-01	Total/NA	Solid	7471A	164507
720-59091-5	MM-SD-02	Total/NA	Solid	7471A	164507
720-59091-7	MM-SD-03	Total/NA	Solid	7471A	164507
720-59091-8	MM-S-01	Total/NA	Solid	7471A	164507
720-59091-9	MM-S-02	Total/NA	Solid	7471A	164507
720-59091-9 MS	MM-S-02	Total/NA	Solid	7471A	164507
720-59091-9 MSD	MM-S-02	Total/NA	Solid	7471A	164507
720-59091-10	MM-S-03	Total/NA	Solid	7471A	164507
720-59091-11	MM-S-04	Total/NA	Solid	7471A	164507
720-59091-12	MM-S-05	Total/NA	Solid	7471A	164507
720-59091-13	MM-S-06	Total/NA	Solid	7471A	164507
720-59091-14	MM-S-07	Total/NA	Solid	7471A	164507
720-59091-15	MM-S-08	Total/NA	Solid	7471A	164507
720-59091-16	MM-S-09	Total/NA	Solid	7471A	164507
720-59091-17	MM-S-10	Total/NA	Solid	7471A	164507
720-59091-18	MM-S-11	Total/NA	Solid	7471A	164507
720-59091-19	MM-S-12	Total/NA	Solid	7471A	164507
720-59091-20	MM-S-13	Total/NA	Solid	7471A	164507
720-59091-21	MM-S-14	Total/NA	Solid	7471A	164507
720-59091-22	MM-S-15	Total/NA	Solid	7471A	164507
LCS 720-164507/2-A	Lab Control Sample	Total/NA	Solid	7471A	164507
LCSD 720-164507/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	164507
MB 720-164507/1-A	Method Blank	Total/NA	Solid	7471A	164507

Metals (Continued)

Analysis Batch: 164623

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-1	MM-SW-01	Total/NA	Water	7470A	164585
720-59091-4	MM-SW-02	Total/NA	Water	7470A	164585
720-59091-6	MM-SW-03	Total/NA	Water	7470A	164585
LCS 720-164585/2-A	Lab Control Sample	Total/NA	Water	7470A	164585
LCSD 720-164585/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	164585
MB 720-164585/1-A	Method Blank	Total/NA	Water	7470A	164585

Analysis Batch: 164777

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-1	MM-SW-01	Total/NA	Water	6010B	164491

Analysis Batch: 164778

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-20	MM-S-13	Total/NA	Solid	6010B	164490
720-59091-21	MM-S-14	Total/NA	Solid	6010B	164490
720-59091-22	MM-S-15	Total/NA	Solid	6010B	164490

Analysis Batch: 164782

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-1	MM-SW-01	Total/NA	Water	SM 2340B	
720-59091-4	MM-SW-02	Total/NA	Water	SM 2340B	
720-59091-6	MM-SW-03	Total/NA	Water	SM 2340B	
LCS 720-164782/2	Lab Control Sample	Total/NA	Water	SM 2340B	
LCSD 720-164782/3	Lab Control Sample Dup	Total/NA	Water	SM 2340B	
MB 720-164782/1	Method Blank	Total/NA	Water	SM 2340B	

General Chemistry

Leach Batch: 164534

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-2	MM-SD-01	Soluble	Solid	DI Leach	
720-59091-2 DU	MM-SD-01	Soluble	Solid	DI Leach	
720-59091-3	MM-BG-01	Soluble	Solid	DI Leach	
720-59091-5	MM-SD-02	Soluble	Solid	DI Leach	
720-59091-7	MM-SD-03	Soluble	Solid	DI Leach	
720-59091-8	MM-S-01	Soluble	Solid	DI Leach	
720-59091-9	MM-S-02	Soluble	Solid	DI Leach	
720-59091-10	MM-S-03	Soluble	Solid	DI Leach	
720-59091-11	MM-S-04	Soluble	Solid	DI Leach	
720-59091-12	MM-S-05	Soluble	Solid	DI Leach	
720-59091-13	MM-S-06	Soluble	Solid	DI Leach	
720-59091-14	MM-S-07	Soluble	Solid	DI Leach	
720-59091-15	MM-S-08	Soluble	Solid	DI Leach	
720-59091-16	MM-S-09	Soluble	Solid	DI Leach	
720-59091-17	MM-S-10	Soluble	Solid	DI Leach	
720-59091-18	MM-S-11	Soluble	Solid	DI Leach	
720-59091-19	MM-S-12	Soluble	Solid	DI Leach	
720-59091-20	MM-S-13	Soluble	Solid	DI Leach	
720-59091-21	MM-S-14	Soluble	Solid	DI Leach	
720-59091-22	MM-S-15	Soluble	Solid	DI Leach	

General Chemistry (Continued)

Analysis Batch: 164576

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-2	MM-SD-01	Soluble	Solid	9045C	164534
720-59091-2 DU	MM-SD-01	Soluble	Solid	9045C	164534
720-59091-3	MM-BG-01	Soluble	Solid	9045C	164534
720-59091-5	MM-SD-02	Soluble	Solid	9045C	164534
720-59091-7	MM-SD-03	Soluble	Solid	9045C	164534
720-59091-8	MM-S-01	Soluble	Solid	9045C	164534
720-59091-9	MM-S-02	Soluble	Solid	9045C	164534
720-59091-10	MM-S-03	Soluble	Solid	9045C	164534
720-59091-11	MM-S-04	Soluble	Solid	9045C	164534
720-59091-12	MM-S-05	Soluble	Solid	9045C	164534
720-59091-13	MM-S-06	Soluble	Solid	9045C	164534
720-59091-14	MM-S-07	Soluble	Solid	9045C	164534
720-59091-15	MM-S-08	Soluble	Solid	9045C	164534
720-59091-16	MM-S-09	Soluble	Solid	9045C	164534
720-59091-17	MM-S-10	Soluble	Solid	9045C	164534
720-59091-18	MM-S-11	Soluble	Solid	9045C	164534
720-59091-19	MM-S-12	Soluble	Solid	9045C	164534
720-59091-20	MM-S-13	Soluble	Solid	9045C	164534
720-59091-21	MM-S-14	Soluble	Solid	9045C	164534
720-59091-22	MM-S-15	Soluble	Solid	9045C	164534
LCS 720-164576/1	Lab Control Sample	Total/NA	Solid	9045C	

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-SW-01 — Lab Sample ID: 720-59091-1

Date Collected: 07/31/14 10:25
Matrix: Water
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			164491	08/06/14 15:42	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164584	08/07/14 15:49	SLK	TAL PLS
Total/NA	Prep	3010A			164491	08/06/14 15:42	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164777	08/12/14 11:17	EFH	TAL PLS
Total/NA	Prep	7470A			164585	08/07/14 16:43	ASB	TAL PLS
Total/NA	Analysis	7470A		1	164623	08/08/14 11:04	EFH	TAL PLS
Total/NA	Analysis	SM 2340B		1	164782	08/12/14 12:51	EFH	TAL PLS

Client Sample ID: MM-SD-01 — Lab Sample ID: 720-59091-2

Date Collected: 07/31/14 10:30
Matrix: Solid
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 13:39	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 10:35	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		5	164592	08/07/14 19:12	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 15:23	EYT	TAL PLS

Client Sample ID: MM-BG-01 — Lab Sample ID: 720-59091-3

Date Collected: 07/31/14 10:45
Matrix: Solid
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 10:40	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		1	164592	08/07/14 19:14	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 15:27	EYT	TAL PLS

Client Sample ID: MM-SW-02 — Lab Sample ID: 720-59091-4

Date Collected: 07/31/14 11:15
Matrix: Water
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			164491	08/06/14 15:42	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164584	08/07/14 16:03	SLK	TAL PLS
Total/NA	Prep	7470A			164585	08/07/14 16:43	ASB	TAL PLS
Total/NA	Analysis	7470A		1	164623	08/08/14 11:06	EFH	TAL PLS
Total/NA	Analysis	SM 2340B		1	164782	08/12/14 12:51	EFH	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-SD-02 — Lab Sample ID: 720-59091-5

Date Collected: 07/31/14 11:20
Matrix: Solid
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 10:45	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		50	164592	08/07/14 18:08	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 15:29	EYT	TAL PLS

Client Sample ID: MM-SW-03 — Lab Sample ID: 720-59091-6

Date Collected: 07/31/14 11:40
Matrix: Water
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			164491	08/06/14 15:42	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164584	08/07/14 16:08	SLK	TAL PLS
Total/NA	Prep	7470A			164585	08/07/14 16:43	ASB	TAL PLS
Total/NA	Analysis	7470A		1	164623	08/08/14 11:09	EFH	TAL PLS
Total/NA	Analysis	SM 2340B		1	164782	08/12/14 12:51	EFH	TAL PLS

Client Sample ID: MM-SD-03 — Lab Sample ID: 720-59091-7

Date Collected: 07/31/14 11:45
Matrix: Solid
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 10:50	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		50	164592	08/07/14 18:10	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 15:31	EYT	TAL PLS

Client Sample ID: MM-S-01 — Lab Sample ID: 720-59091-8

Date Collected: 07/31/14 15:15
Matrix: Solid
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		4	164527	08/07/14 00:03	SLK	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		50	164592	08/07/14 18:18	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 15:33	EYT	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-02

Lab Sample ID: 720-59091-9

Date Collected: 07/31/14 15:20
Matrix: Solid
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 10:54	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		500	164592	08/07/14 19:09	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 15:34	EYT	TAL PLS

Client Sample ID: MM-S-03

Lab Sample ID: 720-59091-10

Date Collected: 07/31/14 15:40
Matrix: Solid
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 10:59	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		500	164592	08/07/14 19:16	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 15:36	EYT	TAL PLS

Client Sample ID: MM-S-04

Lab Sample ID: 720-59091-11

Date Collected: 07/31/14 15:45
Matrix: Solid
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 11:04	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		5000	164592	08/07/14 19:19	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 15:39	EYT	TAL PLS

Client Sample ID: MM-S-05

Lab Sample ID: 720-59091-12

Date Collected: 07/31/14 15:55
Matrix: Solid
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 11:09	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		50	164592	08/07/14 19:21	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 15:41	EYT	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-06 — Lab Sample ID: 720-59091-13

Date Collected: 07/31/14 16:00 — **Matrix: Solid**
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 11:24	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		50	164592	08/07/14 18:28	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 15:48	EYT	TAL PLS

Client Sample ID: MM-S-07 — Lab Sample ID: 720-59091-14

Date Collected: 07/31/14 16:15 — **Matrix: Solid**
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 11:29	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		50	164592	08/07/14 18:31	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 15:54	EYT	TAL PLS

Client Sample ID: MM-S-08 — Lab Sample ID: 720-59091-15

Date Collected: 07/31/14 16:25 — **Matrix: Solid**
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 11:34	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		50	164592	08/07/14 18:33	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 15:56	EYT	TAL PLS

Client Sample ID: MM-S-09 — Lab Sample ID: 720-59091-16

Date Collected: 07/31/14 16:30 — **Matrix: Solid**
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		4	164527	08/07/14 00:51	SLK	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		50	164592	08/07/14 18:35	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 15:58	EYT	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-10

Lab Sample ID: 720-59091-17

Date Collected: 07/31/14 16:45
Matrix: Solid
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 11:38	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		500	164592	08/07/14 19:24	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 16:00	EYT	TAL PLS

Client Sample ID: MM-S-11

Lab Sample ID: 720-59091-18

Date Collected: 07/31/14 16:50
Matrix: Solid
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 11:43	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		5	164592	08/07/14 19:27	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 16:02	EYT	TAL PLS

Client Sample ID: MM-S-12

Lab Sample ID: 720-59091-19

Date Collected: 07/31/14 17:00
Matrix: Solid
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164478	08/06/14 14:50	ASB	TAL PLS
Total/NA	Analysis	6010B		1	164564	08/07/14 11:48	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		50	164592	08/07/14 18:47	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 16:05	EYT	TAL PLS

Client Sample ID: MM-S-13

Lab Sample ID: 720-59091-20

Date Collected: 07/31/14 17:10
Matrix: Solid
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164490	08/06/14 15:32	JCR	TAL PLS
Total/NA	Analysis	6010B		1	164778	08/12/14 11:35	EFH	TAL PLS
Total/NA	Prep	3050B			164490	08/06/14 15:32	JCR	TAL PLS
Total/NA	Analysis	6010B		1	164565	08/07/14 12:23	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		50	164592	08/07/14 18:49	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Client Sample ID: MM-S-13 — Lab Sample ID: 720-59091-20

Date Collected: 07/31/14 17:10 — **Matrix: Solid**
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Analysis	9045C		1	164576	08/07/14 16:07	EYT	TAL PLS

Client Sample ID: MM-S-14 — Lab Sample ID: 720-59091-21

Date Collected: 07/31/14 17:25 — **Matrix: Solid**
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164490	08/06/14 15:32	JCR	TAL PLS
Total/NA	Analysis	6010B		1	164778	08/12/14 11:40	EFH	TAL PLS
Total/NA	Prep	3050B			164490	08/06/14 15:32	JCR	TAL PLS
Total/NA	Analysis	6010B		1	164565	08/07/14 12:28	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		50	164592	08/07/14 18:52	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 16:09	EYT	TAL PLS

Client Sample ID: MM-S-15 — Lab Sample ID: 720-59091-22

Date Collected: 07/31/14 17:35 — **Matrix: Solid**
Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			164490	08/06/14 15:32	JCR	TAL PLS
Total/NA	Analysis	6010B		1	164778	08/12/14 11:44	EFH	TAL PLS
Total/NA	Prep	3050B			164490	08/06/14 15:32	JCR	TAL PLS
Total/NA	Analysis	6010B		1	164565	08/07/14 12:32	EFH	TAL PLS
Total/NA	Prep	7471A			164507	08/06/14 19:35	ECT	TAL PLS
Total/NA	Analysis	7471A		1	164592	08/07/14 19:34	SLK	TAL PLS
Soluble	Leach	DI Leach			164534	08/07/14 10:10	MJK	TAL PLS
Soluble	Analysis	9045C		1	164576	08/07/14 16:10	EYT	TAL PLS

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-16

Method Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL PLS
7470A	Mercury (CVAA)	SW846	TAL PLS
7471A	Mercury (CVAA)	SW846	TAL PLS
SM 2340B	Hardness, Calculation	SM	TAL PLS
9045C	pH	SW846	TAL PLS

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-59091-1	MM-SW-01	Water	07/31/14 10:25	08/05/14 18:20
720-59091-2	MM-SD-01	Solid	07/31/14 10:30	08/05/14 18:20
720-59091-3	MM-BG-01	Solid	07/31/14 10:45	08/05/14 18:20
720-59091-4	MM-SW-02	Water	07/31/14 11:15	08/05/14 18:20
720-59091-5	MM-SD-02	Solid	07/31/14 11:20	08/05/14 18:20
720-59091-6	MM-SW-03	Water	07/31/14 11:40	08/05/14 18:20
720-59091-7	MM-SD-03	Solid	07/31/14 11:45	08/05/14 18:20
720-59091-8	MM-S-01	Solid	07/31/14 15:15	08/05/14 18:20
720-59091-9	MM-S-02	Solid	07/31/14 15:20	08/05/14 18:20
720-59091-10	MM-S-03	Solid	07/31/14 15:40	08/05/14 18:20
720-59091-11	MM-S-04	Solid	07/31/14 15:45	08/05/14 18:20
720-59091-12	MM-S-05	Solid	07/31/14 15:55	08/05/14 18:20
720-59091-13	MM-S-06	Solid	07/31/14 16:00	08/05/14 18:20
720-59091-14	MM-S-07	Solid	07/31/14 16:15	08/05/14 18:20
720-59091-15	MM-S-08	Solid	07/31/14 16:25	08/05/14 18:20
720-59091-16	MM-S-09	Solid	07/31/14 16:30	08/05/14 18:20
720-59091-17	MM-S-10	Solid	07/31/14 16:45	08/05/14 18:20
720-59091-18	MM-S-11	Solid	07/31/14 16:50	08/05/14 18:20
720-59091-19	MM-S-12	Solid	07/31/14 17:00	08/05/14 18:20
720-59091-20	MM-S-13	Solid	07/31/14 17:10	08/05/14 18:20
720-59091-21	MM-S-14	Solid	07/31/14 17:25	08/05/14 18:20
720-59091-22	MM-S-15	Solid	07/31/14 17:35	08/05/14 18:20

155414

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ERRG

Engineering / Remediation Resources Group, Inc.

Phone:
Fax: :

720-59091

Lab No.
Address

720-59091 Chain of Custody

Project Contact (Hardcopy or PDF To): Samantha Caruthers-Knight	California EDF Report? Navy EDD Report?
Laboratory: Test America	Electronic Deliverables To (Email Address): samantha.knight@errg.com
Phone No.: / Fax No.:	Sampler : Samantha Caruthers-Knight
Project Number: 2014-083 / Phase # / Task # 2.01	
Project Name: Mammoth PASI	Project Address: Eel River
Project Manager:	

Chain-of-Custody Record and Analysis Request

	Sample Designation	Sampling Date	Sampling Time	Container 8 oz jar	Container 250 mL poly	Container	Container	Container	Matrix Soil	Matrix Water	Matrix Preservative	CAM-17 Metals EPA 6010B/7470/7471	W.E.T. STLC and TCLP; HOLD	Total Hardness (EPA 130.2)	Paste pH (EPA 9045)	HOLD						12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
1	MM-SW-01	7/31/14	10:25		x					x	HNO3	x		x									2		
2	MM-SD-01	7/31/14	10:30	x					x			x	x		x								1		
3	MM-BG-01	7/31/14	10:45	x					x			x	x		x								1		
4	MM-SW-02	7/31/14	11:15		x					x	HNO3	x		x									2		
5	MM-SD-02	7/31/14	11:20	x					x			x	x		x								1		
6	MM-SW-03	7/31/14	11:40		x					x	HNO3	x		x									2		
7	MM-SD-03	7/31/14	11:45	x					x			x	x		x								1		
8	MM-S-01	7/13/14	15:15	x					x			x	x		x								2		
9	MM-S-02	7/31/14	15:20	x					x			x	x		x								2		
10	MM-S-03	7/31/14	15:40	x					x			x	x		x								2		

Relinquished by:	Date	Time	Received by:
	8/5/14	1400	
Relinquished by: Samantha Bauer	8/5/14	1400	Received by:
Relinquished by:	8/5/14	1820	Received by Laboratory: Joan Mullen

Remarks:

5.8°

Bill to: Engineering / Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, CA 94553

ERRG

Engineering / Remediation Resources Group, Inc.

Phone:
Fax: :

Lab No. 720-59091
Address

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155444

8/20/2014

Project Contact (Hardcopy or PDF To): Samantha Caruthers-Knight	California EDF Report? Navy EDD Report?
Laboratory: Test America	Electronic Deliverables To (Email Address): samantha.knight@errg.com
Phone No.: / Fax No.:	Sampler : Samantha Caruthers-Knight
Project Number: 2014-083 / Phase # / Task # 2.01	
Project Name: Mammoth PASI	Project Address: Eel River
Project Manager:	

Chain-of-Custody Record and Analysis Request

	Sample Designation	Sampling Date	Sampling Time	Container 8 oz jar	Container 250 mL poly				Matrix Soil	Matrix Water		CAM-17 Metals EPA 6010B/7470/7471	W.E.T. STLC and TCLP; HOLD	Total Hardness (EPA 130.2)	Paste pH (EPA 9045)	HOLD						12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
11	MM-S-04	7/31/14	15:45	x					x			x	x		x								2		
12	MM-S-05	7/31/14	15:55	x					x			x	x		x								2		
13	MM-S-06	7/31/14	16:00	x					x			x	x		x								2		
14	MM-S-07	7/31/14	16:15	x					x			x	x		x								2		
15	MM-S-08	7/31/14	16:25	x					x			x	x		x								2		
16	MM-S-09	7/31/14	16:30	x					x			x	x		x								2		
17	MM-S-10	7/31/14	16:45	x					x			x	x		x								2		
18	MM-S-11	7/31/14	16:50	x					x			x	x		x								2		
19	MM-S-12	7/31/14	17:00	x					x			x	x		x								2		
20	MM-S-13	7/31/14	17:10	x					x			x	x		x								2		

	Date	Time		
Relinquished by:	8/5/14	1400	Received by:	Remarks:
Relinquished by: Samantha Bauer	8/5/14	1400	Received by:	
Relinquished by:	8/5/14	1820	Received by Laboratory:	Bill to: Engineering / Remediation Resources Group, Inc. 4585 Pacheco Blvd, Suite 200 Martinez, CA 94553

8/20/2014

ERRG

Engineering / Remediation Resources Group, Inc.

Phone:
Fax: :

Lab No. 720-59091
Address

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155444

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): Samantha Caruthers-Knight	California EDF Report? Navy EDD Report?
Laboratory: Test America	Electronic Deliverables To (Email Address): samantha.knight@errg.com
Phone No.: / Fax No.:	Sampler : Samantha Caruthers-Knight
Project Number: 2014-083 / Phase # / Task # 2.01	
Project Name: Mammoth PASI	Project Address: Eel River
Project Manager:	

	Sample Designation	Sampling Date	Sampling Time	Container: 8 oz jar	Container: 250 mL poly	Container:	Container:	Container:	Matrix: Soil	Matrix: Water	Matrix: Preservative	Analysis Request: CAM-17 Metals EPA 6010B/7470/7471	W.E.T. STLC and TCLP; HOLD	Total Hardness (EPA 130.2)	Paste pH (EPA 9045)	HOLD						12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
21	MM-S-14	7/31/14	17:25	x					x			x	x		x								2		
22	MM-S-15	7/31/14	17:35	x					x			x	x		x								2		
23	MM-SW-04	8/1/14	7:15		x					x	HNO3	x		x		x							1		

	Date	Time		
Relinquished by:	8/5/14	1400	Received by:	Remarks:
Relinquished by: Samantha Bauer	8/5/14	1400	Received by:	
Relinquished by:	8/5/14	1820	Received by Laboratory:	Bill to: Engineering / Remediation Resources Group, Inc. 4585 Pacheco Blvd, Suite 200 Martinez, CA 94553

Smith, Micah 720-59091-2

From: Samantha Caruthers-Knight [Samantha.Caruthers-Knight@errg.com]
Sent: Wednesday, August 13, 2014 4:05 PM
To: Smith, Micah
Subject: RE: Files from 720-59091-1 Mammoth PASI

Hi Micah, per our conversation earlier. Looks like hardness was done on the unfiltered samples so we are all set there, but please analyze the Field Filtered water samples for **Dissolved** Metals.

Also I believe this was on the COC but please hold all soil samples until further notice for leachability sampling (SPLP and perhaps TCLP). Extra volume was provided for all samples, but only some will be leach tested. It will take a week or so to crunch the numbers and figure out which samples should be analyzed.

Thanks!
Samantha

From: Smith, Micah [mailto:micah.smith@testamericainc.com]
Sent: Tuesday, August 12, 2014 5:46 PM
To: Samantha Caruthers-Knight
Subject: Files from 720-59091-1 Mammoth PASI

Please let us know if we met your expectations by rating the service you received from TestAmerica on this project by visiting our website at: Project Feedback

MICAH SMITH
Project Manager II

TestAmerica Pleasanton
THE LEADER IN ENVIRONMENTAL TESTING

Tel: 925.484 1919
www.testamericainc.com

720-59091 Chain of Custody

Reference: [164585]
Attachments: 2

Login Sample Receipt Checklist

Client: Engineering Remediation Resources Group.

Job Number: 720-59091-1

Login Number: 59091

List Source: TestAmerica Pleasanton

List Number: 1

Creator: Bullock, Tracy

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-59091-2
Client Project/Site: Mammoth PASI

For:
Engineering Remediation Resources Group.
4585 Pacheco Boulevard
Suite 200
Martinez, California 94553-2233

Attn: Ms. Samantha C Knight

Authorized for release by:
8/20/2014 6:25:34 PM
Micah Smith, Project Manager II
(925)484-1919
micah.smith@testamericainc.com

Designee for

Dimple Sharma, Senior Project Manager
(925)484-1919
dimple.sharma@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 720-59091-2

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-59091-2

Comments
No additional comments.

Receipt
The samples were received on 8/5/2014 6:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 5.8º C.

Except:

One of the two metals poly 250ml containers received for MM-SW-01, MM-SW-02, MM-SW-03 has "FIELD FILTERED" written on them, the other containers have "UNFILTERED" written on them. Samples were logged in for analysis as requested. Received only one poly 250ml container for MM-SW-04 which has FIELD FILTERED written on the container, logged in this sample on hold per the COC.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-2

Client Sample ID: MM-SW-01 — Lab Sample ID: 720-59091-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.0065	J	0.010	0.0041	mg/L	1		6010B	Dissolved
Arsenic	0.042		0.010	0.0029	mg/L	1		6010B	Dissolved
Barium	0.052		0.0050	0.0016	mg/L	1		6010B	Dissolved
Lead	0.0067		0.0050	0.0022	mg/L	1		6010B	Dissolved
Zinc	0.025		0.020	0.0074	mg/L	1		6010B	Dissolved

Client Sample ID: MM-SW-02 — Lab Sample ID: 720-59091-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.029		0.010	0.0029	mg/L	1		6010B	Dissolved
Barium	0.058		0.0050	0.0016	mg/L	1		6010B	Dissolved
Lead	0.0076		0.0050	0.0022	mg/L	1		6010B	Dissolved
Zinc	0.025		0.020	0.0074	mg/L	1		6010B	Dissolved

Client Sample ID: MM-SW-03 — Lab Sample ID: 720-59091-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.031		0.010	0.0029	mg/L	1		6010B	Dissolved
Barium	0.052		0.0050	0.0016	mg/L	1		6010B	Dissolved
Lead	0.0076		0.0050	0.0022	mg/L	1		6010B	Dissolved
Zinc	0.018	J	0.020	0.0074	mg/L	1		6010B	Dissolved

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-2

Client Sample ID: MM-SW-01

Lab Sample ID: 720-59091-1

Date Collected: 07/31/14 10:25

Matrix: Water

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.0065**	**J**	0.010	0.0041	mg/L		08/15/14 11:43	08/19/14 12:58	1
Arsenic	**0.042**		0.010	0.0029	mg/L		08/15/14 11:43	08/19/14 12:58	1
Barium	**0.052**		0.0050	0.0016	mg/L		08/15/14 11:43	08/19/14 12:58	1
Beryllium	ND		0.0020	0.00059	mg/L		08/15/14 11:43	08/19/14 12:58	1
Cadmium	ND		0.0020	0.00021	mg/L		08/15/14 11:43	08/19/14 12:58	1
Chromium	ND		0.010	0.00070	mg/L		08/15/14 11:43	08/19/14 12:58	1
Cobalt	ND		0.0020	0.00068	mg/L		08/15/14 11:43	08/19/14 12:58	1
Copper	ND		0.020	0.0037	mg/L		08/15/14 11:43	08/19/14 12:58	1
Lead	**0.0067**		0.0050	0.0022	mg/L		08/15/14 11:43	08/19/14 22:41	1
Molybdenum	ND		0.010	0.0029	mg/L		08/15/14 11:43	08/19/14 22:41	1
Nickel	ND		0.010	0.0010	mg/L		08/15/14 11:43	08/19/14 12:58	1
Selenium	ND		0.020	0.0046	mg/L		08/15/14 11:43	08/19/14 12:58	1
Silver	ND		0.0050	0.0020	mg/L		08/15/14 11:43	08/19/14 12:58	1
Thallium	ND		0.010	0.0035	mg/L		08/15/14 11:43	08/19/14 12:58	1
Vanadium	ND		0.010	0.00087	mg/L		08/15/14 11:43	08/19/14 12:58	1
Zinc	**0.025**		0.020	0.0074	mg/L		08/15/14 11:43	08/19/14 12:58	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/15/14 13:44	08/15/14 19:18	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-2

Client Sample ID: MM-SW-02

Lab Sample ID: 720-59091-4

Date Collected: 07/31/14 11:15

Matrix: Water

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010	0.0041	mg/L		08/15/14 11:43	08/19/14 13:07	1
Arsenic	**0.029**		0.010	0.0029	mg/L		08/15/14 11:43	08/19/14 13:07	1
Barium	**0.058**		0.0050	0.0016	mg/L		08/15/14 11:43	08/19/14 13:07	1
Beryllium	ND		0.0020	0.00059	mg/L		08/15/14 11:43	08/19/14 13:07	1
Cadmium	ND		0.0020	0.00021	mg/L		08/15/14 11:43	08/19/14 13:07	1
Chromium	ND		0.010	0.00070	mg/L		08/15/14 11:43	08/19/14 13:07	1
Cobalt	ND		0.0020	0.00068	mg/L		08/15/14 11:43	08/19/14 13:07	1
Copper	ND		0.020	0.0037	mg/L		08/15/14 11:43	08/19/14 13:07	1
Lead	**0.0076**		0.0050	0.0022	mg/L		08/15/14 11:43	08/19/14 16:19	1
Molybdenum	ND		0.010	0.0029	mg/L		08/15/14 11:43	08/19/14 13:07	1
Nickel	ND		0.010	0.0010	mg/L		08/15/14 11:43	08/19/14 13:07	1
Selenium	ND		0.020	0.0046	mg/L		08/15/14 11:43	08/19/14 13:07	1
Silver	ND		0.0050	0.0020	mg/L		08/15/14 11:43	08/19/14 13:07	1
Thallium	ND		0.010	0.0035	mg/L		08/15/14 11:43	08/19/14 13:07	1
Vanadium	ND		0.010	0.00087	mg/L		08/15/14 11:43	08/19/14 13:07	1
Zinc	**0.025**		0.020	0.0074	mg/L		08/15/14 11:43	08/19/14 13:07	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/15/14 13:44	08/15/14 19:16	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-2

Client Sample ID: MM-SW-03

Lab Sample ID: 720-59091-6

Date Collected: 07/31/14 11:40

Matrix: Water

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010	0.0041	mg/L		08/15/14 11:43	08/19/14 13:12	1
Arsenic	**0.031**		0.010	0.0029	mg/L		08/15/14 11:43	08/19/14 13:12	1
Barium	**0.052**		0.0050	0.0016	mg/L		08/15/14 11:43	08/19/14 13:12	1
Beryllium	ND		0.0020	0.00059	mg/L		08/15/14 11:43	08/19/14 13:12	1
Cadmium	ND		0.0020	0.00021	mg/L		08/15/14 11:43	08/19/14 13:12	1
Chromium	ND		0.010	0.00070	mg/L		08/15/14 11:43	08/19/14 13:12	1
Cobalt	ND		0.0020	0.00068	mg/L		08/15/14 11:43	08/19/14 13:12	1
Copper	ND		0.020	0.0037	mg/L		08/15/14 11:43	08/19/14 13:12	1
Lead	**0.0076**		0.0050	0.0022	mg/L		08/15/14 11:43	08/19/14 22:46	1
Molybdenum	ND		0.010	0.0029	mg/L		08/15/14 11:43	08/19/14 13:12	1
Nickel	ND		0.010	0.0010	mg/L		08/15/14 11:43	08/19/14 13:12	1
Selenium	ND		0.020	0.0046	mg/L		08/15/14 11:43	08/19/14 13:12	1
Silver	ND		0.0050	0.0020	mg/L		08/15/14 11:43	08/19/14 13:12	1
Thallium	ND		0.010	0.0035	mg/L		08/15/14 11:43	08/19/14 13:12	1
Vanadium	ND		0.010	0.00087	mg/L		08/15/14 11:43	08/19/14 13:12	1
Zinc	**0.018**	**J**	0.020	0.0074	mg/L		08/15/14 11:43	08/19/14 13:12	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/15/14 13:44	08/15/14 19:20	1

QC Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-2

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 720-165027/1-A
Matrix: Water
Analysis Batch: 165244

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 165027

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010	0.0041	mg/L		08/15/14 11:43	08/19/14 12:36	1
Arsenic	ND		0.010	0.0029	mg/L		08/15/14 11:43	08/19/14 12:36	1
Barium	ND		0.0050	0.0016	mg/L		08/15/14 11:43	08/19/14 12:36	1
Beryllium	ND		0.0020	0.00059	mg/L		08/15/14 11:43	08/19/14 12:36	1
Cadmium	ND		0.0020	0.00021	mg/L		08/15/14 11:43	08/19/14 12:36	1
Chromium	ND		0.010	0.00070	mg/L		08/15/14 11:43	08/19/14 12:36	1
Cobalt	ND		0.0020	0.00068	mg/L		08/15/14 11:43	08/19/14 12:36	1
Copper	ND		0.020	0.0037	mg/L		08/15/14 11:43	08/19/14 12:36	1
Lead	ND		0.0050	0.0022	mg/L		08/15/14 11:43	08/19/14 12:36	1
Molybdenum	ND		0.010	0.0029	mg/L		08/15/14 11:43	08/19/14 12:36	1
Nickel	ND		0.010	0.0010	mg/L		08/15/14 11:43	08/19/14 12:36	1
Selenium	ND		0.020	0.0046	mg/L		08/15/14 11:43	08/19/14 12:36	1
Silver	ND		0.0050	0.0020	mg/L		08/15/14 11:43	08/19/14 12:36	1
Thallium	ND		0.010	0.0035	mg/L		08/15/14 11:43	08/19/14 12:36	1
Vanadium	ND		0.010	0.00087	mg/L		08/15/14 11:43	08/19/14 12:36	1
Zinc	ND		0.020	0.0074	mg/L		08/15/14 11:43	08/19/14 12:36	1

Lab Sample ID: LCS 720-165027/2-A
Matrix: Water
Analysis Batch: 165244

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 165027

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	1.00	0.919		mg/L		92	80 - 120
Arsenic	1.00	0.919		mg/L		92	80 - 120
Barium	1.00	0.966		mg/L		97	80 - 120
Beryllium	1.00	0.963		mg/L		96	80 - 120
Cadmium	1.00	0.921		mg/L		92	80 - 120
Chromium	1.00	0.974		mg/L		97	80 - 120
Cobalt	1.00	0.955		mg/L		95	80 - 120
Copper	1.00	0.975		mg/L		97	80 - 120
Lead	1.00	0.926		mg/L		93	80 - 120
Molybdenum	1.00	0.876		mg/L		88	80 - 120
Nickel	1.00	0.921		mg/L		92	80 - 120
Selenium	1.00	0.971		mg/L		97	80 - 120
Silver	0.500	0.475		mg/L		95	80 - 120
Thallium	1.00	0.944		mg/L		94	80 - 120
Vanadium	1.00	0.979		mg/L		98	80 - 120
Zinc	1.00	0.878		mg/L		88	80 - 120

Lab Sample ID: LCSD 720-165027/3-A
Matrix: Water
Analysis Batch: 165244

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 165027

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	1.00	0.933		mg/L		93	80 - 120	2	20
Arsenic	1.00	0.928		mg/L		93	80 - 120	1	20
Barium	1.00	0.964		mg/L		96	80 - 120	0	20
Beryllium	1.00	0.958		mg/L		96	80 - 120	1	20

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCSD 720-165027/3-A
Matrix: Water
Analysis Batch: 165244

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 165027

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cadmium	1.00	0.926		mg/L		93	80 - 120	1	20
Chromium	1.00	0.977		mg/L		98	80 - 120	0	20
Cobalt	1.00	0.960		mg/L		96	80 - 120	1	20
Copper	1.00	0.972		mg/L		97	80 - 120	0	20
Lead	1.00	0.932		mg/L		93	80 - 120	1	20
Molybdenum	1.00	0.899		mg/L		90	80 - 120	3	20
Nickel	1.00	0.930		mg/L		93	80 - 120	1	20
Selenium	1.00	0.972		mg/L		97	80 - 120	0	20
Silver	0.500	0.478		mg/L		96	80 - 120	1	20
Thallium	1.00	0.955		mg/L		96	80 - 120	1	20
Vanadium	1.00	0.980		mg/L		98	80 - 120	0	20
Zinc	1.00	0.885		mg/L		88	80 - 120	1	20

Lab Sample ID: 720-59091-1 MS
Matrix: Water
Analysis Batch: 165244

Client Sample ID: MM-SW-01
Prep Type: Dissolved
Prep Batch: 165027

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.0065		1.00	0.938		mg/L		93	75 - 125
Arsenic	0.042		1.00	0.981		mg/L		94	75 - 125
Barium	0.052		1.00	1.04		mg/L		98	75 - 125
Beryllium	ND		1.00	0.976		mg/L		98	75 - 125
Cadmium	ND		1.00	0.919		mg/L		92	75 - 125
Chromium	ND		1.00	0.982		mg/L		98	75 - 125
Cobalt	ND		1.00	0.952		mg/L		95	75 - 125
Copper	ND		1.00	0.986		mg/L		99	75 - 125
Lead	0.0068		1.00	0.924		mg/L		92	75 - 125
Molybdenum	0.016		1.00	0.944		mg/L		93	75 - 125
Nickel	ND		1.00	0.914		mg/L		91	75 - 125
Selenium	ND		1.00	0.954		mg/L		95	75 - 125
Silver	ND		0.500	0.481		mg/L		96	75 - 125
Thallium	ND		1.00	0.937		mg/L		94	75 - 125
Vanadium	ND		1.00	0.990		mg/L		99	75 - 125
Zinc	0.025		1.00	0.905		mg/L		88	75 - 125

Lab Sample ID: 720-59091-1 MSD
Matrix: Water
Analysis Batch: 165244

Client Sample ID: MM-SW-01
Prep Type: Dissolved
Prep Batch: 165027

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	0.0065		1.00	0.935		mg/L		93	75 - 125	0	20
Arsenic	0.042		1.00	0.977		mg/L		94	75 - 125	0	20
Barium	0.052		1.00	1.02		mg/L		97	75 - 125	2	20
Beryllium	ND		1.00	0.966		mg/L		97	75 - 125	1	20
Cadmium	ND		1.00	0.916		mg/L		92	75 - 125	0	20
Chromium	ND		1.00	0.974		mg/L		97	75 - 125	1	20
Cobalt	ND		1.00	0.948		mg/L		95	75 - 125	0	20
Copper	ND		1.00	0.976		mg/L		98	75 - 125	1	20
Lead	0.0068		1.00	0.924		mg/L		92	75 - 125	0	20

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: 720-59091-1 MSD — **Client Sample ID: MM-SW-01**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 165244 — **Prep Batch: 165027**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Molybdenum	0.016		1.00	0.946		mg/L		93	75 - 125	0	20
Nickel	ND		1.00	0.913		mg/L		91	75 - 125	0	20
Selenium	ND		1.00	0.950		mg/L		95	75 - 125	0	20
Silver	ND		0.500	0.475		mg/L		95	75 - 125	1	20
Thallium	ND		1.00	0.936		mg/L		94	75 - 125	0	20
Vanadium	ND		1.00	0.985		mg/L		98	75 - 125	1	20
Zinc	0.025		1.00	0.903		mg/L		88	75 - 125	0	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 720-165035/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 165076 — **Prep Batch: 165035**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/15/14 13:44	08/15/14 19:02	1

Lab Sample ID: LCS 720-165035/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 165076 — **Prep Batch: 165035**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.0100	0.00964		mg/L		96	85 - 115

Lab Sample ID: LCSD 720-165035/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 165076 — **Prep Batch: 165035**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.0100	0.00954		mg/L		95	85 - 115	1	20

Lab Sample ID: 720-59091-4 MS — **Client Sample ID: MM-SW-02**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 165076 — **Prep Batch: 165035**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		0.0100	0.00970		mg/L		97	70 - 130

Lab Sample ID: 720-59091-4 MSD — **Client Sample ID: MM-SW-02**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 165076 — **Prep Batch: 165035**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		0.0100	0.00904		mg/L		90	70 - 130	7	20

QC Association Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-2

Metals

Prep Batch: 165027

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-1	MM-SW-01	Dissolved	Water	3005A	
720-59091-1 MS	MM-SW-01	Dissolved	Water	3005A	
720-59091-1 MSD	MM-SW-01	Dissolved	Water	3005A	
720-59091-4	MM-SW-02	Dissolved	Water	3005A	
720-59091-6	MM-SW-03	Dissolved	Water	3005A	
LCS 720-165027/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 720-165027/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 720-165027/1-A	Method Blank	Total Recoverable	Water	3005A	

Prep Batch: 165035

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-1	MM-SW-01	Dissolved	Water	7470A	
720-59091-4	MM-SW-02	Dissolved	Water	7470A	
720-59091-4 MS	MM-SW-02	Dissolved	Water	7470A	
720-59091-4 MSD	MM-SW-02	Dissolved	Water	7470A	
720-59091-6	MM-SW-03	Dissolved	Water	7470A	
LCS 720-165035/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 720-165035/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	
MB 720-165035/1-A	Method Blank	Total/NA	Water	7470A	

Analysis Batch: 165076

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-1	MM-SW-01	Dissolved	Water	7470A	165035
720-59091-4	MM-SW-02	Dissolved	Water	7470A	165035
720-59091-4 MS	MM-SW-02	Dissolved	Water	7470A	165035
720-59091-4 MSD	MM-SW-02	Dissolved	Water	7470A	165035
720-59091-6	MM-SW-03	Dissolved	Water	7470A	165035
LCS 720-165035/2-A	Lab Control Sample	Total/NA	Water	7470A	165035
LCSD 720-165035/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	165035
MB 720-165035/1-A	Method Blank	Total/NA	Water	7470A	165035

Analysis Batch: 165244

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-1	MM-SW-01	Dissolved	Water	6010B	165027
720-59091-1 MS	MM-SW-01	Dissolved	Water	6010B	165027
720-59091-1 MSD	MM-SW-01	Dissolved	Water	6010B	165027
720-59091-4	MM-SW-02	Dissolved	Water	6010B	165027
720-59091-6	MM-SW-03	Dissolved	Water	6010B	165027
LCS 720-165027/2-A	Lab Control Sample	Total Recoverable	Water	6010B	165027
LCSD 720-165027/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010B	165027
MB 720-165027/1-A	Method Blank	Total Recoverable	Water	6010B	165027

Analysis Batch: 165261

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-4	MM-SW-02	Dissolved	Water	6010B	165027

Analysis Batch: 165302

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-1	MM-SW-01	Dissolved	Water	6010B	165027
720-59091-6	MM-SW-03	Dissolved	Water	6010B	165027

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-2

Client Sample ID: MM-SW-01

Lab Sample ID: 720-59091-1

Date Collected: 07/31/14 10:25

Matrix: Water

Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			165027	08/15/14 11:43	ECT	TAL PLS
Dissolved	Analysis	6010B		1	165244	08/19/14 12:58	EFH	TAL PLS
Dissolved	Prep	3005A			165027	08/15/14 11:43	ECT	TAL PLS
Dissolved	Analysis	6010B		1	165302	08/19/14 22:41	SLK	TAL PLS
Dissolved	Prep	7470A			165035	08/15/14 13:44	ECT	TAL PLS
Dissolved	Analysis	7470A		1	165076	08/15/14 19:18	SLK	TAL PLS

Client Sample ID: MM-SW-02

Lab Sample ID: 720-59091-4

Date Collected: 07/31/14 11:15

Matrix: Water

Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			165027	08/15/14 11:43	ECT	TAL PLS
Dissolved	Analysis	6010B		1	165244	08/19/14 13:07	EFH	TAL PLS
Dissolved	Prep	3005A			165027	08/15/14 11:43	ECT	TAL PLS
Dissolved	Analysis	6010B		1	165261	08/19/14 16:19	SLK	TAL PLS
Dissolved	Prep	7470A			165035	08/15/14 13:44	ECT	TAL PLS
Dissolved	Analysis	7470A		1	165076	08/15/14 19:16	SLK	TAL PLS

Client Sample ID: MM-SW-03

Lab Sample ID: 720-59091-6

Date Collected: 07/31/14 11:40

Matrix: Water

Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			165027	08/15/14 11:43	ECT	TAL PLS
Dissolved	Analysis	6010B		1	165244	08/19/14 13:12	EFH	TAL PLS
Dissolved	Prep	3005A			165027	08/15/14 11:43	ECT	TAL PLS
Dissolved	Analysis	6010B		1	165302	08/19/14 22:46	SLK	TAL PLS
Dissolved	Prep	7470A			165035	08/15/14 13:44	ECT	TAL PLS
Dissolved	Analysis	7470A		1	165076	08/15/14 19:20	SLK	TAL PLS

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-2

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-16

Method Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-2

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL PLS
7470A	Mercury (CVAA)	SW846	TAL PLS

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-59091-1	MM-SW-01	Water	07/31/14 10:25	08/05/14 18:20
720-59091-4	MM-SW-02	Water	07/31/14 11:15	08/05/14 18:20
720-59091-6	MM-SW-03	Water	07/31/14 11:40	08/05/14 18:20

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ERRG Engineering / Remediation Resources Group, Inc.

Phone:
Fax: :

720-59091

Lab No.
Address

720-59091 Chain of Custody

Project Contact (Hardcopy or PDF To): Samantha Caruthers-Knight	California EDF Report? Navy EDD Report?
Laboratory: Test America	Electronic Deliverables To (Email Address): samantha.knight@errg.com
Phone No.: / Fax No.:	Sampler : Samantha Caruthers-Knight
Project Number: 2014-083 / Phase # / Task # 2.01	
Project Name: Mammoth PASI	Project Address: Eel River
Project Manager:	

Chain-of-Custody Record and Analysis Request

	Sample Designation	Sampling Date	Sampling Time	Container 8 oz jar	Container 250 mL poly	Container	Container	Container	Matrix Soil	Matrix Water	Matrix Preservative	CAM-17 Metals EPA 6010B/7470/7471	W.E.T. STLC and TCLP; HOLD	Total Hardness (EPA 130.2)	Paste pH (EPA 9045)	HOLD						12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
1	MM-SW-01	7/31/14	10:25		x					x	HNO3	x		x									2		
2	MM-SD-01	7/31/14	10:30	x					x			x	x		x								1		
3	MM-BG-01	7/31/14	10:45	x					x			x	x		x								1		
4	MM-SW-02	7/31/14	11:15		x					x	HNO3	x		x									2		
5	MM-SD-02	7/31/14	11:20	x					x			x	x		x								1		
6	MM-SW-03	7/31/14	11:40		x					x	HNO3	x		x									2		
7	MM-SD-03	7/31/14	11:45	x					x			x	x		x								1		
8	MM-S-01	7/13/14	15:15	x					x			x	x		x								2		
9	MM-S-02	7/31/14	15:20	x					x			x	x		x								2		
10	MM-S-03	7/31/14	15:40	x					x			x	x		x								2		

Relinquished by:	Date	Time	Received by:
	8/5/14	1400	
Relinquished by: Samantha Bauer	8/5/14	1400	Received by:
Relinquished by:	8/5/14	1820	Received by Laboratory: Joan Mullen

Remarks:

5.8°

Bill to: Engineering / Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, CA 94553

ERRG

Engineering / Remediation Resources Group, Inc.

Phone:
Fax: :

Lab No. 720-59091
Address

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155444

8/20/2014

Project Contact (Hardcopy or PDF To): Samantha Caruthers-Knight	California EDF Report? Navy EDD Report?
Laboratory: Test America	Electronic Deliverables To (Email Address): samantha.knight@errg.com
Phone No.: / Fax No.:	Sampler : Samantha Caruthers-Knight
Project Number: 2014-083 / Phase # / Task # 2.01	
Project Name: Mammoth PASI	Project Address: Eel River
Project Manager:	

Chain-of-Custody Record and Analysis Request

	Sample Designation	Sampling Date	Sampling Time	Container 8 oz jar	Container 250 mL poly	Matrix Soil	Matrix Water	CAM-17 Metals EPA 6010B/7470/7471	W.E.T. STLC and TCLP; HOLD	Total Hardness (EPA 130.2)	Paste pH (EPA 9045)	HOLD	12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
11	MM-S-04	7/31/14	15:45	x		x		x	x		x			2		
12	MM-S-05	7/31/14	15:55	x		x		x	x		x			2		
13	MM-S-06	7/31/14	16:00	x		x		x	x		x			2		
14	MM-S-07	7/31/14	16:15	x		x		x	x		x			2		
15	MM-S-08	7/31/14	16:25	x		x		x	x		x			2		
16	MM-S-09	7/31/14	16:30	x		x		x	x		x			2		
17	MM-S-10	7/31/14	16:45	x		x		x	x		x			2		
18	MM-S-11	7/31/14	16:50	x		x		x	x		x			2		
19	MM-S-12	7/31/14	17:00	x		x		x	x		x			2		
20	MM-S-13	7/31/14	17:10	x		x		x	x		x			2		

Relinquished by:	Date	Time	Received by:
	8/5/14	1400	
Relinquished by: Samantha Bauer	8/5/14	1400	Received by:
Relinquished by:	8/5/14	1820	Received by Laboratory:

Remarks:

Bill to: Engineering / Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, CA 94553

8/20/2014

ERRG

Engineering / Remediation Resources Group, Inc.

Phone:
Fax: :

Lab No. 720-59091
Address

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155444

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): Samantha Caruthers-Knight	California EDF Report? Navy EDD Report?
Laboratory: Test America	Electronic Deliverables To (Email Address): samantha.knight@errg.com
Phone No.: / Fax No.:	Sampler : Samantha Caruthers-Knight
Project Number: 2014-083 / Phase # / Task # 2.01	
Project Name: Mammoth PASI	Project Address: Eel River
Project Manager:	

	Sample Designation	Sampling Date	Sampling Time	Container: 8 oz jar	Container: 250 mL poly	Container:	Container:	Container:	Matrix: Soil	Matrix: Water	Matrix: Preservative	Analysis Request: CAM-17 Metals EPA 6010B/7470/7471	W.E.T. STLC and TCLP; HOLD	Total Hardness (EPA 130.2)	Paste pH (EPA 9045)	HOLD						12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
21	MM-S-14	7/31/14	17:25	x					x			x	x		x								2		
22	MM-S-15	7/31/14	17:35	x					x			x	x		x								2		
23	MM-SW-04	8/1/14	7:15		x					x	HNO3	x		x		x							1		

Relinquished by:	Date 8/5/14	Time 1400	Received by:
Relinquished by: Samantha Bauer	Date 8/5/14	Time 1400	Received by:
Relinquished by:	Date 8/5/14	Time 1820	Received by Laboratory:

Remarks:

Bill to: Engineering / Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, CA 94553

Smith, Micah 720-59091-2

From: Samantha Caruthers-Knight [Samantha.Caruthers-Knight@errg.com]
Sent: Wednesday, August 13, 2014 4:05 PM
To: Smith, Micah
Subject: RE: Files from 720-59091-1 Mammoth PASI

Hi Micah, per our conversation earlier. Looks like hardness was done on the unfiltered samples so we are all set there, but please analyze the Field Filtered water samples for **Dissolved** Metals.

Also I believe this was on the COC but please hold all soil samples until further notice for leachability sampling (SPLP and perhaps TCLP). Extra volume was provided for all samples, but only some will be leach tested. It will take a week or so to crunch the numbers and figure out which samples should be analyzed.

Thanks!
Samantha

From: Smith, Micah [mailto:micah.smith@testamericainc.com]
Sent: Tuesday, August 12, 2014 5:46 PM
To: Samantha Caruthers-Knight
Subject: Files from 720-59091-1 Mammoth PASI

Please let us know if we met your expectations by rating the service you received from TestAmerica on this project by visiting our website at: Project Feedback

MICAH SMITH
Project Manager II

TestAmerica Pleasanton
THE LEADER IN ENVIRONMENTAL TESTING

Tel: 925.484 1919
www.testamericainc.com

720-59091 Chain of Custody

Reference: [164585]
Attachments: 2

Login Sample Receipt Checklist

Client: Engineering Remediation Resources Group.

Job Number: 720-59091-2

Login Number: 59091

List Source: TestAmerica Pleasanton

List Number: 1

Creator: Bullock, Tracy

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-59091-3
Client Project/Site: Mammoth PASI
Revision: 1

For:
Engineering Remediation Resources Group.
4585 Pacheco Boulevard
Suite 200
Martinez, California 94553-2233

Attn: Ms. Samantha C Knight

Authorized for release by:
9/25/2014 3:00:30 PM

Dimple Sharma, Senior Project Manager
(925)484-1919
dimple.sharma@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-3

Qualifiers

Metals

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 720-59091-3

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-59091-3

Comments
No additional comments.

Receipt
The samples were received on 8/5/2014 6:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.8º C.

Metals
Method 7470A: The following sample was analyzed outside of analytical holding time per client request: (720-59091-8), (720-59091-11), (720-59091-16), MM-S-01 (720-59091-8), MM-S-04 (720-59091-11), MM-S-09 (720-59091-16).

Method 6010B: The method blank for preparation batch 205236 contained Zinc above the reporting limit (RL). None of the samples associated with this method blank contained the target compound above the reporting limits; therefore, re-extraction and/or re-analysis of samples were not performed. (720-59091-8), (720-59091-11), (720-59091-16), MM-S-01 (720-59091-8), MM-S-04 (720-59091-11), MM-S-09 (720-59091-16)

Method 6010B: The continuing calibration blank (CCB) for analytical batch 166674 contained As above the reporting limit (RL). All reported samples associated with this CCB were ND for this analyte; therefore, re-analysis of samples was not performed.

Method 7470A: The following sample was analyzed outside of analytical holding time due to client request: MM-S-01 (720-59091-8), MM-S-04 (720-59091-11), MM-S-09 (720-59091-16).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-3

Client Sample ID: MM-S-01 — Lab Sample ID: 720-59091-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lead	3.1		0.050	0.023	mg/L	1		6010B	TCLP
Antimony	0.27	B	0.20	0.070	mg/L	1		6010B	SPLP West
Lead	0.26		0.10	0.040	mg/L	1		6010B	SPLP West
Zinc	0.11	J B	0.40	0.060	mg/L	1		6010B	SPLP West
Mercury	0.00034	J H B	0.0020	0.000020	mg/L	1		7470A	TCLP
Mercury	0.011	H	0.0020	0.0010	mg/L	1		7470A	SPLP West

Client Sample ID: MM-S-04 — Lab Sample ID: 720-59091-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lead	0.21		0.050	0.023	mg/L	1		6010B	TCLP
Silver	0.015	J	0.050	0.012	mg/L	1		6010B	TCLP
Antimony	0.083	J B	0.20	0.070	mg/L	1		6010B	SPLP West
Barium	0.29		0.20	0.060	mg/L	1		6010B	SPLP West
Copper	0.048	J B	0.20	0.030	mg/L	1		6010B	SPLP West
Lead	0.14		0.10	0.040	mg/L	1		6010B	SPLP West
Zinc	0.075	J B	0.40	0.060	mg/L	1		6010B	SPLP West
Mercury	0.28	H B	0.040	0.00040	mg/L	20		7470A	TCLP
Mercury	0.69	H	0.020	0.010	mg/L	10		7470A	SPLP West

Client Sample ID: MM-S-09 — Lab Sample ID: 720-59091-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lead	0.31		0.050	0.023	mg/L	1		6010B	TCLP
Silver	0.054		0.050	0.012	mg/L	1		6010B	TCLP
Arsenic	0.055	J	0.10	0.026	mg/L	1		6010B	TCLP
Barium	1.1		0.20	0.060	mg/L	1		6010B	SPLP West
Copper	0.095	J B	0.20	0.030	mg/L	1		6010B	SPLP West
Lead	0.29		0.10	0.040	mg/L	1		6010B	SPLP West
Zinc	0.14	J B	0.40	0.060	mg/L	1		6010B	SPLP West
Silver	0.077	J	0.20	0.060	mg/L	1		6010B	SPLP West
Mercury	0.0042	H B	0.0020	0.000020	mg/L	1		7470A	TCLP
Mercury	0.018	H	0.0020	0.0010	mg/L	1		7470A	SPLP West

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-3

Client Sample ID: MM-S-01

Lab Sample ID: 720-59091-8

Date Collected: 07/31/14 15:15

Matrix: Solid

Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**3.1**		0.050	0.023	mg/L		09/11/14 12:13	09/11/14 23:49	1
Silver	ND		0.050	0.012	mg/L		09/11/14 12:13	09/11/14 23:49	1
Arsenic	ND		0.10	0.026	mg/L		09/11/14 12:13	09/11/14 23:49	1

Method: 6010B - Metals (ICP) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.27**	**B**	0.20	0.070	mg/L		09/10/14 14:46	09/11/14 13:11	1
Arsenic	ND		0.20	0.070	mg/L		09/10/14 14:46	09/11/14 13:11	1
Barium	ND		0.20	0.060	mg/L		09/10/14 14:46	09/11/14 13:11	1
Beryllium	ND		0.080	0.010	mg/L		09/10/14 14:46	09/11/14 13:11	1
Cadmium	ND		0.10	0.020	mg/L		09/10/14 14:46	09/11/14 13:11	1
Chromium	ND		0.10	0.020	mg/L		09/10/14 14:46	09/11/14 13:11	1
Cobalt	ND		0.20	0.020	mg/L		09/10/14 14:46	09/11/14 13:11	1
Copper	ND		0.20	0.030	mg/L		09/10/14 14:46	09/11/14 13:11	1
Lead	**0.26**		0.10	0.040	mg/L		09/10/14 14:46	09/11/14 13:11	1
Molybdenum	ND		0.40	0.020	mg/L		09/10/14 14:46	09/11/14 13:11	1
Nickel	ND		0.20	0.020	mg/L		09/10/14 14:46	09/11/14 13:11	1
Selenium	ND		0.10	0.080	mg/L		09/10/14 14:46	09/11/14 13:11	1
Thallium	ND		0.10	0.080	mg/L		09/10/14 14:46	09/11/14 13:11	1
Vanadium	ND		0.20	0.030	mg/L		09/10/14 14:46	09/11/14 13:11	1
Zinc	**0.11**	**J B**	0.40	0.060	mg/L		09/10/14 14:46	09/11/14 13:11	1
Silver	ND		0.20	0.060	mg/L		09/10/14 14:46	09/11/14 13:11	1

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.00034**	**J H B**	0.0020	0.000020	mg/L		09/12/14 10:58	09/12/14 14:59	1

Method: 7470A - Mercury (CVAA) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.011**	**H**	0.0020	0.0010	mg/L		09/10/14 16:50	09/10/14 17:33	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-3

Client Sample ID: MM-S-04

Lab Sample ID: 720-59091-11

Date Collected: 07/31/14 15:45
Matrix: Solid
Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**0.21**		0.050	0.023	mg/L		09/11/14 12:13	09/11/14 23:54	1
Silver	**0.015**	**J**	0.050	0.012	mg/L		09/11/14 12:13	09/11/14 23:54	1
Arsenic	ND		0.10	0.026	mg/L		09/11/14 12:13	09/11/14 23:54	1

Method: 6010B - Metals (ICP) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.083**	**J B**	0.20	0.070	mg/L		09/10/14 14:46	09/11/14 13:16	1
Arsenic	ND		0.20	0.070	mg/L		09/10/14 14:46	09/11/14 13:16	1
Barium	**0.29**		0.20	0.060	mg/L		09/10/14 14:46	09/11/14 13:16	1
Beryllium	ND		0.080	0.010	mg/L		09/10/14 14:46	09/11/14 13:16	1
Cadmium	ND		0.10	0.020	mg/L		09/10/14 14:46	09/11/14 13:16	1
Chromium	ND		0.10	0.020	mg/L		09/10/14 14:46	09/11/14 13:16	1
Cobalt	ND		0.20	0.020	mg/L		09/10/14 14:46	09/11/14 13:16	1
Copper	**0.048**	**J B**	0.20	0.030	mg/L		09/10/14 14:46	09/11/14 13:16	1
Lead	**0.14**		0.10	0.040	mg/L		09/10/14 14:46	09/11/14 13:16	1
Molybdenum	ND		0.40	0.020	mg/L		09/10/14 14:46	09/11/14 13:16	1
Nickel	ND		0.20	0.020	mg/L		09/10/14 14:46	09/11/14 13:16	1
Selenium	ND		0.10	0.080	mg/L		09/10/14 14:46	09/11/14 13:16	1
Thallium	ND		0.10	0.080	mg/L		09/10/14 14:46	09/11/14 13:16	1
Vanadium	ND		0.20	0.030	mg/L		09/10/14 14:46	09/11/14 13:16	1
Zinc	**0.075**	**J B**	0.40	0.060	mg/L		09/10/14 14:46	09/11/14 13:16	1
Silver	ND		0.20	0.060	mg/L		09/10/14 14:46	09/11/14 13:16	1

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.28**	**H B**	0.040	0.00040	mg/L		09/12/14 10:58	09/12/14 16:07	20

Method: 7470A - Mercury (CVAA) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.69**	**H**	0.020	0.010	mg/L		09/10/14 16:50	09/10/14 17:50	10

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-3

Client Sample ID: MM-S-09

Lab Sample ID: 720-59091-16

Date Collected: 07/31/14 16:30
Matrix: Solid
Date Received: 08/05/14 18:20

Method: 6010B - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	**0.31**		0.050	0.023	mg/L		09/11/14 12:13	09/11/14 23:59	1
Silver	**0.054**		0.050	0.012	mg/L		09/11/14 12:13	09/11/14 23:59	1
Arsenic	**0.055**	**J**	0.10	0.026	mg/L		09/11/14 12:13	09/11/14 23:59	1

Method: 6010B - Metals (ICP) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.20	0.070	mg/L		09/10/14 14:46	09/11/14 13:18	1
Arsenic	ND		0.20	0.070	mg/L		09/10/14 14:46	09/11/14 13:18	1
Barium	**1.1**		0.20	0.060	mg/L		09/10/14 14:46	09/11/14 13:18	1
Beryllium	ND		0.080	0.010	mg/L		09/10/14 14:46	09/11/14 13:18	1
Cadmium	ND		0.10	0.020	mg/L		09/10/14 14:46	09/11/14 13:18	1
Chromium	ND		0.10	0.020	mg/L		09/10/14 14:46	09/11/14 13:18	1
Cobalt	ND		0.20	0.020	mg/L		09/10/14 14:46	09/11/14 13:18	1
Copper	**0.095**	**J B**	0.20	0.030	mg/L		09/10/14 14:46	09/11/14 13:18	1
Lead	**0.29**		0.10	0.040	mg/L		09/10/14 14:46	09/11/14 13:18	1
Molybdenum	ND		0.40	0.020	mg/L		09/10/14 14:46	09/11/14 13:18	1
Nickel	ND		0.20	0.020	mg/L		09/10/14 14:46	09/11/14 13:18	1
Selenium	ND		0.10	0.080	mg/L		09/10/14 14:46	09/11/14 13:18	1
Thallium	ND		0.10	0.080	mg/L		09/10/14 14:46	09/11/14 13:18	1
Vanadium	ND		0.20	0.030	mg/L		09/10/14 14:46	09/11/14 13:18	1
Zinc	**0.14**	**J B**	0.40	0.060	mg/L		09/10/14 14:46	09/11/14 13:18	1
Silver	**0.077**	**J**	0.20	0.060	mg/L		09/10/14 14:46	09/11/14 13:18	1

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.0042**	**H B**	0.0020	0.000020	mg/L		09/12/14 10:58	09/12/14 16:09	1

Method: 7470A - Mercury (CVAA) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.018**	**H**	0.0020	0.0010	mg/L		09/10/14 16:50	09/10/14 17:43	1

QC Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-3

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 720-166608/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 166674 — **Prep Batch: 166608**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.0050	0.0023	mg/L		09/11/14 12:13	09/11/14 22:36	1
Silver	ND		0.0050	0.0012	mg/L		09/11/14 12:13	09/11/14 22:36	1
Arsenic	ND		0.010	0.0026	mg/L		09/11/14 12:13	09/11/14 22:36	1

Lab Sample ID: LCS 720-166608/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 166674 — **Prep Batch: 166608**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	1.00	0.906		mg/L		91	80 - 120
Silver	0.500	0.459		mg/L		92	80 - 120
Arsenic	1.00	0.883		mg/L		88	80 - 120

Lab Sample ID: LCSD 720-166608/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 166674 — **Prep Batch: 166608**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Lead	1.00	0.905		mg/L		90	80 - 120	0	20
Silver	0.500	0.455		mg/L		91	80 - 120	1	20
Arsenic	1.00	0.887		mg/L		89	80 - 120	0	20

Lab Sample ID: LB 720-166542/1-B — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: TCLP**
Analysis Batch: 166674 — **Prep Batch: 166608**

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.050	0.023	mg/L		09/11/14 12:13	09/11/14 23:10	1
Silver	ND		0.050	0.012	mg/L		09/11/14 12:13	09/11/14 23:10	1
Arsenic	ND		0.10	0.026	mg/L		09/11/14 12:13	09/11/14 23:10	1

Lab Sample ID: MB 440-204806/1-B — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: SPLP West**
Analysis Batch: 205324 — **Prep Batch: 205047**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0744	J	0.20	0.070	mg/L		09/10/14 14:46	09/11/14 13:05	1
Arsenic	ND		0.20	0.070	mg/L		09/10/14 14:46	09/11/14 13:05	1
Barium	ND		0.20	0.060	mg/L		09/10/14 14:46	09/11/14 13:05	1
Beryllium	ND		0.080	0.010	mg/L		09/10/14 14:46	09/11/14 13:05	1
Cadmium	ND		0.10	0.020	mg/L		09/10/14 14:46	09/11/14 13:05	1
Chromium	0.0705	J	0.10	0.020	mg/L		09/10/14 14:46	09/11/14 13:05	1
Cobalt	ND		0.20	0.020	mg/L		09/10/14 14:46	09/11/14 13:05	1
Copper	0.0525	J	0.20	0.030	mg/L		09/10/14 14:46	09/11/14 13:05	1
Lead	ND		0.10	0.040	mg/L		09/10/14 14:46	09/11/14 13:05	1
Molybdenum	ND		0.40	0.020	mg/L		09/10/14 14:46	09/11/14 13:05	1
Nickel	0.0395	J	0.20	0.020	mg/L		09/10/14 14:46	09/11/14 13:05	1
Selenium	ND		0.10	0.080	mg/L		09/10/14 14:46	09/11/14 13:05	1
Thallium	ND		0.10	0.080	mg/L		09/10/14 14:46	09/11/14 13:05	1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: MB 440-204806/1-B
Matrix: Solid
Analysis Batch: 205324

Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 205047

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vanadium	ND		0.20	0.030	mg/L		09/10/14 14:46	09/11/14 13:05	1
Zinc	0.882		0.40	0.060	mg/L		09/10/14 14:46	09/11/14 13:05	1
Silver	ND		0.20	0.060	mg/L		09/10/14 14:46	09/11/14 13:05	1

Lab Sample ID: LCS 440-204806/2-B
Matrix: Solid
Analysis Batch: 205324

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 205047

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	2.00	1.95		mg/L		97	80 - 120
Arsenic	2.00	1.92		mg/L		96	80 - 120
Barium	2.00	2.01		mg/L		101	80 - 120
Beryllium	2.00	1.97		mg/L		98	80 - 120
Cadmium	2.00	1.94		mg/L		97	80 - 120
Chromium	2.00	1.98		mg/L		99	80 - 120
Cobalt	2.00	2.09		mg/L		104	80 - 120
Copper	2.00	2.03		mg/L		101	80 - 120
Lead	2.00	1.95		mg/L		97	80 - 120
Molybdenum	2.00	2.00		mg/L		100	80 - 120
Nickel	2.00	2.00		mg/L		100	80 - 120
Selenium	2.00	1.83		mg/L		92	80 - 120
Thallium	2.00	1.96		mg/L		98	80 - 120
Vanadium	2.00	2.02		mg/L		101	80 - 120
Zinc	2.00	1.89		mg/L		95	80 - 120
Silver	1.00	0.986		mg/L		99	80 - 120

Lab Sample ID: 720-59091-8 MS
Matrix: Solid
Analysis Batch: 205324

Client Sample ID: MM-S-01
Prep Type: SPLP West
Prep Batch: 205047

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.27	B	2.00	2.26		mg/L		100	75 - 125
Arsenic	ND		2.00	1.98		mg/L		99	75 - 125
Barium	ND		2.00	2.09		mg/L		104	75 - 125
Beryllium	ND		2.00	1.98		mg/L		99	75 - 125
Cadmium	ND		2.00	1.98		mg/L		99	75 - 125
Chromium	ND		2.00	2.03		mg/L		101	75 - 125
Cobalt	ND		2.00	2.13		mg/L		107	75 - 125
Copper	ND		2.00	2.09		mg/L		104	75 - 125
Lead	0.26		2.00	2.26		mg/L		100	75 - 125
Molybdenum	ND		2.00	2.04		mg/L		102	75 - 125
Nickel	ND		2.00	2.04		mg/L		102	75 - 125
Selenium	ND		2.00	1.79		mg/L		89	75 - 125
Thallium	ND		2.00	2.04		mg/L		102	75 - 125
Vanadium	ND		2.00	2.09		mg/L		104	75 - 125
Zinc	0.11	J B	2.00	2.02		mg/L		95	75 - 125
Silver	ND		1.00	1.01		mg/L		101	75 - 125

QC Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-3

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 720-166688/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 166723 — **Prep Batch: 166688**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000174	J	0.0020	0.000020	mg/L		09/12/14 09:41	09/12/14 15:39	1

Lab Sample ID: LCS 720-166688/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 166719 — **Prep Batch: 166688**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.0100	0.00978		mg/L		98	80 - 120

Lab Sample ID: LCSD 720-166688/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 166719 — **Prep Batch: 166688**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.0100	0.00960		mg/L		96	80 - 120	2	20

Lab Sample ID: LB 720-166542/1-C — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: TCLP**
Analysis Batch: 166719 — **Prep Batch: 166688**

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000192	J	0.0020	0.000020	mg/L		09/12/14 10:58	09/12/14 14:56	1

Lab Sample ID: MB 440-204806/1-C — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: SPLP West**
Analysis Batch: 205123 — **Prep Batch: 205060**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0020	0.0010	mg/L		09/10/14 16:50	09/10/14 17:28	1

Lab Sample ID: LCS 440-204806/2-C — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: SPLP West**
Analysis Batch: 205123 — **Prep Batch: 205060**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.0800	0.0848		mg/L		106	80 - 120

Lab Sample ID: 720-59091-8 MS — **Client Sample ID: MM-S-01**
Matrix: Solid — **Prep Type: SPLP West**
Analysis Batch: 205123 — **Prep Batch: 205060**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.011	H	0.0800	0.0963		mg/L		107	70 - 130

Lab Sample ID: 720-59091-8 MSD — **Client Sample ID: MM-S-01**
Matrix: Solid — **Prep Type: SPLP West**
Analysis Batch: 205123 — **Prep Batch: 205060**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.011	H	0.0800	0.0965		mg/L		107	70 - 130	0	20

QC Association Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-3

Metals

Leach Batch: 166542

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-8	MM-S-01	TCLP	Solid	1311	
720-59091-11	MM-S-04	TCLP	Solid	1311	
720-59091-16	MM-S-09	TCLP	Solid	1311	
LB 720-166542/1-B	Method Blank	TCLP	Solid	1311	
LB 720-166542/1-C	Method Blank	TCLP	Solid	1311	

Prep Batch: 166608

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-8	MM-S-01	TCLP	Solid	3010A	166542
720-59091-11	MM-S-04	TCLP	Solid	3010A	166542
720-59091-16	MM-S-09	TCLP	Solid	3010A	166542
LB 720-166542/1-B	Method Blank	TCLP	Solid	3010A	166542
LCS 720-166608/2-A	Lab Control Sample	Total/NA	Solid	3010A	
LCSD 720-166608/3-A	Lab Control Sample Dup	Total/NA	Solid	3010A	
MB 720-166608/1-A	Method Blank	Total/NA	Solid	3010A	

Analysis Batch: 166674

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-8	MM-S-01	TCLP	Solid	6010B	166608
720-59091-11	MM-S-04	TCLP	Solid	6010B	166608
720-59091-16	MM-S-09	TCLP	Solid	6010B	166608
LB 720-166542/1-B	Method Blank	TCLP	Solid	6010B	166608
LCS 720-166608/2-A	Lab Control Sample	Total/NA	Solid	6010B	166608
LCSD 720-166608/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	166608
MB 720-166608/1-A	Method Blank	Total/NA	Solid	6010B	166608

Prep Batch: 166688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-8	MM-S-01	TCLP	Solid	7470A	166542
720-59091-11	MM-S-04	TCLP	Solid	7470A	166542
720-59091-16	MM-S-09	TCLP	Solid	7470A	166542
LB 720-166542/1-C	Method Blank	TCLP	Solid	7470A	166542
LCS 720-166688/2-A	Lab Control Sample	Total/NA	Solid	7470A	
LCSD 720-166688/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	
MB 720-166688/1-A	Method Blank	Total/NA	Solid	7470A	

Analysis Batch: 166719

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-8	MM-S-01	TCLP	Solid	7470A	166688
LB 720-166542/1-C	Method Blank	TCLP	Solid	7470A	166688
LCS 720-166688/2-A	Lab Control Sample	Total/NA	Solid	7470A	166688
LCSD 720-166688/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	166688

Analysis Batch: 166723

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 720-166688/1-A	Method Blank	Total/NA	Solid	7470A	166688

Analysis Batch: 166729

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-11	MM-S-04	TCLP	Solid	7470A	166688
720-59091-16	MM-S-09	TCLP	Solid	7470A	166688

Metals (Continued)

Leach Batch: 204806

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-8	MM-S-01	SPLP West	Solid	1312	
720-59091-8 MS	MM-S-01	SPLP West	Solid	1312	
720-59091-8 MSD	MM-S-01	SPLP West	Solid	1312	
720-59091-11	MM-S-04	SPLP West	Solid	1312	
720-59091-16	MM-S-09	SPLP West	Solid	1312	
LCS 440-204806/2-B	Lab Control Sample	SPLP West	Solid	1312	
LCS 440-204806/2-C	Lab Control Sample	SPLP West	Solid	1312	
MB 440-204806/1-B	Method Blank	SPLP West	Solid	1312	
MB 440-204806/1-C	Method Blank	SPLP West	Solid	1312	

Prep Batch: 205047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-8	MM-S-01	SPLP West	Solid	3010A	204806
720-59091-8 MS	MM-S-01	SPLP West	Solid	3010A	204806
720-59091-11	MM-S-04	SPLP West	Solid	3010A	204806
720-59091-16	MM-S-09	SPLP West	Solid	3010A	204806
LCS 440-204806/2-B	Lab Control Sample	SPLP West	Solid	3010A	204806
MB 440-204806/1-B	Method Blank	SPLP West	Solid	3010A	204806

Prep Batch: 205060

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-8	MM-S-01	SPLP West	Solid	7470A	204806
720-59091-8 MS	MM-S-01	SPLP West	Solid	7470A	204806
720-59091-8 MSD	MM-S-01	SPLP West	Solid	7470A	204806
720-59091-11	MM-S-04	SPLP West	Solid	7470A	204806
720-59091-16	MM-S-09	SPLP West	Solid	7470A	204806
LCS 440-204806/2-C	Lab Control Sample	SPLP West	Solid	7470A	204806
MB 440-204806/1-C	Method Blank	SPLP West	Solid	7470A	204806

Analysis Batch: 205123

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-8	MM-S-01	SPLP West	Solid	7470A	205060
720-59091-8 MS	MM-S-01	SPLP West	Solid	7470A	205060
720-59091-8 MSD	MM-S-01	SPLP West	Solid	7470A	205060
720-59091-11	MM-S-04	SPLP West	Solid	7470A	205060
720-59091-16	MM-S-09	SPLP West	Solid	7470A	205060
LCS 440-204806/2-C	Lab Control Sample	SPLP West	Solid	7470A	205060
MB 440-204806/1-C	Method Blank	SPLP West	Solid	7470A	205060

Analysis Batch: 205324

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-59091-8	MM-S-01	SPLP West	Solid	6010B	205047
720-59091-8 MS	MM-S-01	SPLP West	Solid	6010B	205047
720-59091-11	MM-S-04	SPLP West	Solid	6010B	205047
720-59091-16	MM-S-09	SPLP West	Solid	6010B	205047
LCS 440-204806/2-B	Lab Control Sample	SPLP West	Solid	6010B	205047
MB 440-204806/1-B	Method Blank	SPLP West	Solid	6010B	205047

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-3

Client Sample ID: MM-S-01

Lab Sample ID: 720-59091-8

Date Collected: 07/31/14 15:15

Matrix: Solid

Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP West	Leach	1312			204806	09/09/14 18:10	CH	TAL IRV
SPLP West	Prep	3010A			205047	09/10/14 14:46	SN	TAL IRV
SPLP West	Analysis	6010B		1	205324	09/11/14 13:11	TK	TAL IRV
TCLP	Leach	1311			166542	09/10/14 17:49	JCR	TAL PLS
TCLP	Prep	3010A			166608	09/11/14 12:13	JCR	TAL PLS
TCLP	Analysis	6010B		1	166674	09/11/14 23:49	SLK	TAL PLS
SPLP West	Leach	1312			204806	09/09/14 18:10	CH	TAL IRV
SPLP West	Prep	7470A			205060	09/10/14 16:50	JS1	TAL IRV
SPLP West	Analysis	7470A		1	205123	09/10/14 17:33	DB	TAL IRV
TCLP	Leach	1311			166542	09/10/14 17:49	JCR	TAL PLS
TCLP	Prep	7470A			166688	09/12/14 10:58	ECT	TAL PLS
TCLP	Analysis	7470A		1	166719	09/12/14 14:59	EFH	TAL PLS

Client Sample ID: MM-S-04

Lab Sample ID: 720-59091-11

Date Collected: 07/31/14 15:45

Matrix: Solid

Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP West	Leach	1312			204806	09/09/14 18:10	CH	TAL IRV
SPLP West	Prep	3010A			205047	09/10/14 14:46	SN	TAL IRV
SPLP West	Analysis	6010B		1	205324	09/11/14 13:16	TK	TAL IRV
TCLP	Leach	1311			166542	09/10/14 17:49	JCR	TAL PLS
TCLP	Prep	3010A			166608	09/11/14 12:13	JCR	TAL PLS
TCLP	Analysis	6010B		1	166674	09/11/14 23:54	SLK	TAL PLS
SPLP West	Leach	1312			204806	09/09/14 18:10	CH	TAL IRV
SPLP West	Prep	7470A			205060	09/10/14 16:50	JS1	TAL IRV
SPLP West	Analysis	7470A		10	205123	09/10/14 17:50	DB	TAL IRV
TCLP	Leach	1311			166542	09/10/14 17:49	JCR	TAL PLS
TCLP	Prep	7470A			166688	09/12/14 10:58	ECT	TAL PLS
TCLP	Analysis	7470A		20	166729	09/12/14 16:07	SLK	TAL PLS

Client Sample ID: MM-S-09

Lab Sample ID: 720-59091-16

Date Collected: 07/31/14 16:30

Matrix: Solid

Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP West	Leach	1312			204806	09/09/14 18:10	CH	TAL IRV
SPLP West	Prep	3010A			205047	09/10/14 14:46	SN	TAL IRV
SPLP West	Analysis	6010B		1	205324	09/11/14 13:18	TK	TAL IRV
TCLP	Leach	1311			166542	09/10/14 17:49	JCR	TAL PLS
TCLP	Prep	3010A			166608	09/11/14 12:13	JCR	TAL PLS
TCLP	Analysis	6010B		1	166674	09/11/14 23:59	SLK	TAL PLS
SPLP West	Leach	1312			204806	09/09/14 18:10	CH	TAL IRV
SPLP West	Prep	7470A			205060	09/10/14 16:50	JS1	TAL IRV

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-3

Client Sample ID: MM-S-09

Lab Sample ID: 720-59091-16

Date Collected: 07/31/14 16:30

Matrix: Solid

Date Received: 08/05/14 18:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP West	Analysis	7470A		1	205123	09/10/14 17:43	DB	TAL IRV
TCLP	Leach	1311			166542	09/10/14 17:49	JCR	TAL PLS
TCLP	Prep	7470A			166688	09/12/14 10:58	ECT	TAL PLS
TCLP	Analysis	7470A		1	166729	09/12/14 16:09	SLK	TAL PLS

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-3

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-16

Laboratory: TestAmerica Irvine

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	CA01531	06-30-15
Arizona	State Program	9	AZ0671	10-13-14 *
California	LA Cty Sanitation Districts	9	10256	01-31-15
California	State Program	9	2706	06-30-16
Guam	State Program	9	Cert. No. 12.002r	01-23-15
Hawaii	State Program	9	N/A	01-29-15 *
Nevada	State Program	9	CA015312007A	07-31-15
New Mexico	State Program	6	N/A	01-29-15
Northern Mariana Islands	State Program	9	MP0002	01-29-15
Oregon	NELAP	10	4005	01-29-15
USDA	Federal		P330-09-00080	06-06-15
USEPA UCMR	Federal	1	CA01531	01-31-15

* Certification renewal pending - certification considered valid.

Method Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-3

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL IRV
6010B	Metals (ICP)	SW846	TAL PLS
7470A	Mercury (CVAA)	SW846	TAL IRV
7470A	Mercury (CVAA)	SW846	TAL PLS

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PASI

TestAmerica Job ID: 720-59091-3

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-59091-8	MM-S-01	Solid	07/31/14 15:15	08/05/14 18:20
720-59091-11	MM-S-04	Solid	07/31/14 15:45	08/05/14 18:20
720-59091-16	MM-S-09	Solid	07/31/14 16:30	08/05/14 18:20

Sharma, Dimple

720-59091-3

From: Samantha Caruthers-Knight <Samantha.Caruthers-Knight@errg.com>
Sent: Friday, September 05, 2014 4:31 PM
To: Sharma, Dimple
Subject: SPLP for 720-59091-1

I'd like to run the following samples from report 720-59091-1 for SPLP and TCLP. Please run SPLP for all metals analyzed in the original report (CAM 17 incl Hg). For TCLP please run arsenic, lead, mercury, and silver.

MM-S-01
MM-S-04
MM-S-09

I suspect we may be outside the hold time for mercury, but please run the analysis anyway and flag that data as outside hold.

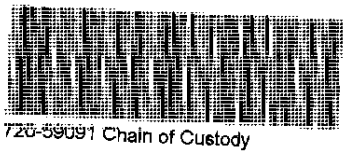
Please also continue to hold the remaining volume of all other samples until further notice.

Thanks
Samantha

Samantha Caruthers-Knight P.G.
Project Geologist
Engineering/Remediation Resources Group, Inc

115 Sansome St, Suite 200
San Francisco CA, 94108
samantha.knight@errg.com

Main (925) 969-0750
Direct (415) 848-7100
Cell (510) 851-3279


720-59091 Chain of Custody

Login Sample Receipt Checklist

Client: Engineering Remediation Resources Group.

Job Number: 720-59091-3

Login Number: 59091

List Source: TestAmerica Pleasanton

List Number: 1

Creator: Bullock, Tracy

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Engineering Remediation Resources Group.

Job Number: 720-59091-3

Login Number: 59091
List Number: 2
Creator: Salas, Margarita

List Source: TestAmerica Irvine
List Creation: 09/09/14 12:11 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-65322-1
Client Project/Site: Mammoth PA/SI

For:
Engineering Remediation Resources Group.
4585 Pacheco Boulevard
Suite 200
Martinez, California 94553-2233

Attn: Ms. Samantha C Knight

Authorized for release by:
6/15/2015 6:05:30 PM

Dimple Sharma, Senior Project Manager
(925)484-1919
dimple.sharma@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 720-65322-1

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-65322-1

Comments
No additional comments.

Receipt
The samples were received on 6/8/2015 3:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.5º C and 2.0º C.

Metals
Method 6010B: The serial dilution performed for the following sample associated with batch 720-183369 was outside control limits: (720-65322-A-4-D SD)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-SD-04 — Lab Sample ID: 720-65322-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.93	B	0.36	0.059	mg/Kg	1		6010B	Total/NA
Arsenic	8.7		2.9	0.24	mg/Kg	4		6010B	Total/NA
Barium	280		1.4	0.20	mg/Kg	4		6010B	Total/NA
Beryllium	0.12		0.071	0.023	mg/Kg	1		6010B	Total/NA
Cadmium	1.2		0.36	0.035	mg/Kg	4		6010B	Total/NA
Chromium	8.3		1.4	0.15	mg/Kg	4		6010B	Total/NA
Cobalt	7.0		0.57	0.057	mg/Kg	4		6010B	Total/NA
Copper	19		4.3	2.0	mg/Kg	4		6010B	Total/NA
Lead	46		1.4	0.30	mg/Kg	4		6010B	Total/NA
Molybdenum	0.36		0.36	0.046	mg/Kg	1		6010B	Total/NA
Nickel	28		1.4	0.15	mg/Kg	4		6010B	Total/NA
Selenium	0.23	J	0.71	0.11	mg/Kg	1		6010B	Total/NA
Silver	4.6		0.71	0.14	mg/Kg	4		6010B	Total/NA
Vanadium	25		1.4	0.19	mg/Kg	4		6010B	Total/NA
Zinc	140		4.3	1.8	mg/Kg	4		6010B	Total/NA
Mercury	3.6		0.042	0.011	mg/Kg	5		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.91		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-SD-05 — Lab Sample ID: 720-65322-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	2.4	B	1.6	0.27	mg/Kg	4		6010B	Total/NA
Arsenic	8.9		3.2	0.27	mg/Kg	4		6010B	Total/NA
Barium	210		1.6	0.23	mg/Kg	4		6010B	Total/NA
Beryllium	0.14		0.081	0.026	mg/Kg	1		6010B	Total/NA
Cadmium	0.29		0.10	0.010	mg/Kg	1		6010B	Total/NA
Chromium	10		1.6	0.17	mg/Kg	4		6010B	Total/NA
Cobalt	7.2		0.65	0.065	mg/Kg	4		6010B	Total/NA
Copper	30		4.8	2.3	mg/Kg	4		6010B	Total/NA
Lead	130		1.6	0.34	mg/Kg	4		6010B	Total/NA
Molybdenum	0.40		0.40	0.052	mg/Kg	1		6010B	Total/NA
Nickel	23		1.6	0.16	mg/Kg	4		6010B	Total/NA
Selenium	0.29	J	0.81	0.12	mg/Kg	1		6010B	Total/NA
Silver	4.5		0.81	0.16	mg/Kg	4		6010B	Total/NA
Vanadium	27		1.6	0.22	mg/Kg	4		6010B	Total/NA
Zinc	59		4.8	2.0	mg/Kg	4		6010B	Total/NA
Mercury	64		1.0	0.25	mg/Kg	100		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.25		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-SD-06 — Lab Sample ID: 720-65322-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	2.7	B	1.7	0.29	mg/Kg	4		6010B	Total/NA
Arsenic	16		3.4	0.29	mg/Kg	4		6010B	Total/NA
Barium	270		1.7	0.24	mg/Kg	4		6010B	Total/NA
Beryllium	0.19		0.086	0.028	mg/Kg	1		6010B	Total/NA
Cadmium	0.93		0.43	0.043	mg/Kg	4		6010B	Total/NA
Chromium	10		1.7	0.18	mg/Kg	4		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-SD-06 (Continued) — Lab Sample ID: 720-65322-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	6.9		0.69	0.069	mg/Kg	4		6010B	Total/NA
Copper	78		5.2	2.5	mg/Kg	4		6010B	Total/NA
Lead	180		1.7	0.36	mg/Kg	4		6010B	Total/NA
Molybdenum	0.71		0.43	0.055	mg/Kg	1		6010B	Total/NA
Nickel	24		1.7	0.18	mg/Kg	4		6010B	Total/NA
Selenium	0.77	J	0.86	0.13	mg/Kg	1		6010B	Total/NA
Silver	19		0.86	0.17	mg/Kg	4		6010B	Total/NA
Vanadium	29		1.7	0.23	mg/Kg	4		6010B	Total/NA
Zinc	99		5.2	2.2	mg/Kg	4		6010B	Total/NA
Mercury	740		8.5	2.1	mg/Kg	1000		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.86		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-SD-07 — Lab Sample ID: 720-65322-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	6.2	F1	1.7	0.28	mg/Kg	4		6010B	Total/NA
Arsenic	17		3.4	0.29	mg/Kg	4		6010B	Total/NA
Barium	400		1.7	0.24	mg/Kg	4		6010B	Total/NA
Beryllium	0.14		0.085	0.028	mg/Kg	1		6010B	Total/NA
Cadmium	1.4		0.43	0.042	mg/Kg	4		6010B	Total/NA
Chromium	6.4		1.7	0.18	mg/Kg	4		6010B	Total/NA
Cobalt	4.7		0.68	0.068	mg/Kg	4		6010B	Total/NA
Copper	85		5.1	2.4	mg/Kg	4		6010B	Total/NA
Lead	360		1.7	0.36	mg/Kg	4		6010B	Total/NA
Molybdenum	1.8		1.7	0.22	mg/Kg	4		6010B	Total/NA
Nickel	12		1.7	0.17	mg/Kg	4		6010B	Total/NA
Selenium	2.0		0.85	0.13	mg/Kg	1		6010B	Total/NA
Silver	17		0.85	0.17	mg/Kg	4		6010B	Total/NA
Thallium	0.15	J	0.43	0.12	mg/Kg	1		6010B	Total/NA
Vanadium	17		1.7	0.23	mg/Kg	4		6010B	Total/NA
Zinc	100		5.1	2.2	mg/Kg	4		6010B	Total/NA
Mercury	410		10	2.5	mg/Kg	1000		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.05		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-SD-08 — Lab Sample ID: 720-65322-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.26	J	0.30	0.050	mg/Kg	1		6010B	Total/NA
Arsenic	5.7		2.4	0.21	mg/Kg	4		6010B	Total/NA
Barium	86		1.2	0.17	mg/Kg	4		6010B	Total/NA
Cadmium	0.24		0.076	0.0075	mg/Kg	1		6010B	Total/NA
Chromium	8.0		1.2	0.13	mg/Kg	4		6010B	Total/NA
Cobalt	3.0		0.48	0.048	mg/Kg	4		6010B	Total/NA
Copper	7.0		3.6	1.7	mg/Kg	4		6010B	Total/NA
Lead	6.1		1.2	0.25	mg/Kg	4		6010B	Total/NA
Molybdenum	0.39		0.30	0.039	mg/Kg	1		6010B	Total/NA
Nickel	8.5		1.2	0.12	mg/Kg	4		6010B	Total/NA
Silver	0.23		0.15	0.031	mg/Kg	1		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MM-SD-08 (Continued) — Lab Sample ID: 720-65322-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Thallium	0.20	J	0.30	0.088	mg/Kg	1		6010B	Total/NA
Vanadium	23		1.2	0.16	mg/Kg	4		6010B	Total/NA
Zinc	38		3.6	1.5	mg/Kg	4		6010B	Total/NA
Mercury	0.50		0.043	0.011	mg/Kg	5		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.01		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-16 — Lab Sample ID: 720-65322-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	6.1		2.9	0.24	mg/Kg	4		6010B	Total/NA
Barium	88		1.4	0.20	mg/Kg	4		6010B	Total/NA
Beryllium	0.17		0.071	0.023	mg/Kg	1		6010B	Total/NA
Cadmium	0.11		0.089	0.0089	mg/Kg	1		6010B	Total/NA
Chromium	6.5		1.4	0.15	mg/Kg	4		6010B	Total/NA
Cobalt	4.3		0.57	0.057	mg/Kg	4		6010B	Total/NA
Copper	6.7		4.3	2.0	mg/Kg	4		6010B	Total/NA
Lead	8.8		1.4	0.30	mg/Kg	4		6010B	Total/NA
Molybdenum	0.45		0.36	0.046	mg/Kg	1		6010B	Total/NA
Nickel	12		1.4	0.15	mg/Kg	4		6010B	Total/NA
Silver	0.31		0.18	0.036	mg/Kg	1		6010B	Total/NA
Thallium	0.20	J	0.36	0.10	mg/Kg	1		6010B	Total/NA
Vanadium	18		1.4	0.19	mg/Kg	4		6010B	Total/NA
Zinc	29		4.3	1.8	mg/Kg	4		6010B	Total/NA
Mercury	0.75		0.045	0.011	mg/Kg	5		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.09		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-17 — Lab Sample ID: 720-65322-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	7.4		3.1	0.26	mg/Kg	4		6010B	Total/NA
Barium	110		1.5	0.22	mg/Kg	4		6010B	Total/NA
Cadmium	0.083	J	0.096	0.0095	mg/Kg	1		6010B	Total/NA
Chromium	7.1		1.5	0.16	mg/Kg	4		6010B	Total/NA
Cobalt	5.8		0.62	0.062	mg/Kg	4		6010B	Total/NA
Copper	8.5		4.6	2.2	mg/Kg	4		6010B	Total/NA
Lead	5.6		1.5	0.32	mg/Kg	4		6010B	Total/NA
Molybdenum	0.28	J	0.38	0.049	mg/Kg	1		6010B	Total/NA
Nickel	16		1.5	0.16	mg/Kg	4		6010B	Total/NA
Silver	0.098	J	0.19	0.039	mg/Kg	1		6010B	Total/NA
Thallium	0.17	J	0.38	0.11	mg/Kg	1		6010B	Total/NA
Vanadium	26		1.5	0.21	mg/Kg	4		6010B	Total/NA
Zinc	29		4.6	2.0	mg/Kg	4		6010B	Total/NA
Mercury	0.55		0.045	0.011	mg/Kg	5		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.16		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-18 — Lab Sample ID: 720-65322-8

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-18 (Continued) — Lab Sample ID: 720-65322-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	1.3		0.46	0.076	mg/Kg	1		6010B	Total/NA
Arsenic	30		3.7	0.31	mg/Kg	4		6010B	Total/NA
Barium	260		1.8	0.26	mg/Kg	4		6010B	Total/NA
Cadmium	0.34		0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	9.0		1.8	0.19	mg/Kg	4		6010B	Total/NA
Cobalt	7.4		0.73	0.073	mg/Kg	4		6010B	Total/NA
Copper	21		5.5	2.6	mg/Kg	4		6010B	Total/NA
Lead	91		1.8	0.39	mg/Kg	4		6010B	Total/NA
Molybdenum	0.47		0.46	0.059	mg/Kg	1		6010B	Total/NA
Nickel	28		1.8	0.19	mg/Kg	4		6010B	Total/NA
Selenium	0.28	J	0.92	0.14	mg/Kg	1		6010B	Total/NA
Silver	2.3		0.92	0.19	mg/Kg	4		6010B	Total/NA
Thallium	0.27	J	0.46	0.13	mg/Kg	1		6010B	Total/NA
Vanadium	24		1.8	0.25	mg/Kg	4		6010B	Total/NA
Zinc	75		5.5	2.3	mg/Kg	4		6010B	Total/NA
Mercury	1.8		1.0	0.25	mg/Kg	100		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.61		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-19 — Lab Sample ID: 720-65322-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	1.0		0.46	0.077	mg/Kg	1		6010B	Total/NA
Arsenic	11		3.7	0.31	mg/Kg	4		6010B	Total/NA
Barium	290		1.9	0.26	mg/Kg	4		6010B	Total/NA
Cadmium	0.28		0.12	0.011	mg/Kg	1		6010B	Total/NA
Chromium	9.9		1.9	0.20	mg/Kg	4		6010B	Total/NA
Cobalt	8.6		0.74	0.074	mg/Kg	4		6010B	Total/NA
Copper	18		5.6	2.6	mg/Kg	4		6010B	Total/NA
Lead	51		1.9	0.39	mg/Kg	4		6010B	Total/NA
Molybdenum	0.53		0.46	0.059	mg/Kg	1		6010B	Total/NA
Nickel	30		1.9	0.19	mg/Kg	4		6010B	Total/NA
Selenium	0.17	J	0.93	0.14	mg/Kg	1		6010B	Total/NA
Silver	3.1		0.93	0.19	mg/Kg	4		6010B	Total/NA
Thallium	0.29	J	0.46	0.13	mg/Kg	1		6010B	Total/NA
Vanadium	29		1.9	0.25	mg/Kg	4		6010B	Total/NA
Zinc	77		5.6	2.4	mg/Kg	4		6010B	Total/NA
Mercury	4.0		0.92	0.23	mg/Kg	100		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.91		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-20 — Lab Sample ID: 720-65322-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.47		0.45	0.074	mg/Kg	1		6010B	Total/NA
Arsenic	9.6		3.6	0.30	mg/Kg	4		6010B	Total/NA
Barium	97		1.8	0.25	mg/Kg	4		6010B	Total/NA
Beryllium	0.031	J	0.089	0.029	mg/Kg	1		6010B	Total/NA
Cadmium	0.11		0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	8.0		1.8	0.19	mg/Kg	4		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-20 (Continued) — Lab Sample ID: 720-65322-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	4.3		0.71	0.071	mg/Kg	4		6010B	Total/NA
Copper	11		5.4	2.5	mg/Kg	4		6010B	Total/NA
Lead	170		1.8	0.38	mg/Kg	4		6010B	Total/NA
Molybdenum	0.58		0.45	0.057	mg/Kg	1		6010B	Total/NA
Nickel	9.1		1.8	0.18	mg/Kg	4		6010B	Total/NA
Selenium	0.25	J	0.89	0.13	mg/Kg	1		6010B	Total/NA
Silver	2.7		0.89	0.18	mg/Kg	4		6010B	Total/NA
Thallium	0.17	J	0.45	0.13	mg/Kg	1		6010B	Total/NA
Vanadium	16		1.8	0.24	mg/Kg	4		6010B	Total/NA
Zinc	36		5.4	2.3	mg/Kg	4		6010B	Total/NA
Mercury	9.3		0.92	0.23	mg/Kg	100		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.53		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-21 — Lab Sample ID: 720-65322-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	6.4		3.6	0.31	mg/Kg	4		6010B	Total/NA
Barium	87		1.8	0.26	mg/Kg	4		6010B	Total/NA
Cadmium	0.086	J	0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	5.2		1.8	0.19	mg/Kg	4		6010B	Total/NA
Cobalt	3.7		0.73	0.073	mg/Kg	4		6010B	Total/NA
Copper	6.0		5.5	2.6	mg/Kg	4		6010B	Total/NA
Lead	8.3		1.8	0.38	mg/Kg	4		6010B	Total/NA
Molybdenum	0.52		0.45	0.058	mg/Kg	1		6010B	Total/NA
Nickel	8.4		1.8	0.19	mg/Kg	4		6010B	Total/NA
Silver	0.13	J	0.23	0.046	mg/Kg	1		6010B	Total/NA
Thallium	0.21	J	0.45	0.13	mg/Kg	1		6010B	Total/NA
Vanadium	17		1.8	0.25	mg/Kg	4		6010B	Total/NA
Zinc	31		5.5	2.3	mg/Kg	4		6010B	Total/NA
Mercury	0.77		0.049	0.012	mg/Kg	5		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.37		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-22 — Lab Sample ID: 720-65322-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	4.6		3.4	0.29	mg/Kg	4		6010B	Total/NA
Barium	74		1.7	0.24	mg/Kg	4		6010B	Total/NA
Beryllium	0.036	J	0.085	0.028	mg/Kg	1		6010B	Total/NA
Cadmium	0.14		0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	4.5		1.7	0.18	mg/Kg	4		6010B	Total/NA
Cobalt	4.2		0.68	0.068	mg/Kg	4		6010B	Total/NA
Copper	11		5.1	2.4	mg/Kg	4		6010B	Total/NA
Lead	17		1.7	0.36	mg/Kg	4		6010B	Total/NA
Molybdenum	0.78		0.42	0.054	mg/Kg	1		6010B	Total/NA
Nickel	9.4		1.7	0.17	mg/Kg	4		6010B	Total/NA
Silver	0.19	J	0.21	0.043	mg/Kg	1		6010B	Total/NA
Vanadium	12		1.7	0.23	mg/Kg	4		6010B	Total/NA
Zinc	20		5.1	2.2	mg/Kg	4		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MM-S-22 (Continued) — Lab Sample ID: 720-65322-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Mercury	0.58		0.048	0.012	mg/Kg	5		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.83		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-23 — Lab Sample ID: 720-65322-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	6.4		3.5	0.30	mg/Kg	4		6010B	Total/NA
Barium	84		1.8	0.25	mg/Kg	4		6010B	Total/NA
Cadmium	0.20		0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	9.2		1.8	0.19	mg/Kg	4		6010B	Total/NA
Cobalt	3.2		0.71	0.071	mg/Kg	4		6010B	Total/NA
Copper	11		5.3	2.5	mg/Kg	4		6010B	Total/NA
Lead	9.6		1.8	0.37	mg/Kg	4		6010B	Total/NA
Molybdenum	0.55		0.44	0.057	mg/Kg	1		6010B	Total/NA
Nickel	9.4		1.8	0.18	mg/Kg	4		6010B	Total/NA
Selenium	0.16	J	0.88	0.13	mg/Kg	1		6010B	Total/NA
Silver	0.89		0.88	0.18	mg/Kg	4		6010B	Total/NA
Vanadium	20		1.8	0.24	mg/Kg	4		6010B	Total/NA
Zinc	39		5.3	2.2	mg/Kg	4		6010B	Total/NA
Mercury	8.7		0.94	0.23	mg/Kg	100		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.89		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-24 — Lab Sample ID: 720-65322-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	5.8		1.7	0.28	mg/Kg	4		6010B	Total/NA
Arsenic	30		3.4	0.29	mg/Kg	4		6010B	Total/NA
Barium	720		1.7	0.24	mg/Kg	4		6010B	Total/NA
Beryllium	0.029	J	0.085	0.028	mg/Kg	1		6010B	Total/NA
Cadmium	1.3		0.43	0.042	mg/Kg	4		6010B	Total/NA
Chromium	5.3		1.7	0.18	mg/Kg	4		6010B	Total/NA
Cobalt	4.1		0.68	0.068	mg/Kg	4		6010B	Total/NA
Copper	42		5.1	2.4	mg/Kg	4		6010B	Total/NA
Lead	93		1.7	0.36	mg/Kg	4		6010B	Total/NA
Molybdenum	1.9		1.7	0.22	mg/Kg	4		6010B	Total/NA
Nickel	9.5		1.7	0.17	mg/Kg	4		6010B	Total/NA
Selenium	2.2		0.85	0.13	mg/Kg	1		6010B	Total/NA
Silver	15		0.85	0.17	mg/Kg	4		6010B	Total/NA
Thallium	0.19	J	0.43	0.12	mg/Kg	1		6010B	Total/NA
Vanadium	15		1.7	0.23	mg/Kg	4		6010B	Total/NA
Zinc	130		5.1	2.2	mg/Kg	4		6010B	Total/NA
Mercury	120		0.94	0.23	mg/Kg	100		7471A	Total/NA

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.39		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-25 — Lab Sample ID: 720-65322-15

This Detection Summary does not include radiochemical test results.

Client Sample ID: MM-S-25 (Continued) — Lab Sample ID: 720-65322-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	4.4		3.2	0.27	mg/Kg	4		6010B	Total/NA
Barium	76		1.6	0.23	mg/Kg	4		6010B	Total/NA
Cadmium	0.12		0.099	0.0098	mg/Kg	1		6010B	Total/NA
Chromium	6.9		1.6	0.17	mg/Kg	4		6010B	Total/NA
Cobalt	4.8		0.63	0.063	mg/Kg	4		6010B	Total/NA
Copper	6.2		4.8	2.3	mg/Kg	4		6010B	Total/NA
Lead	10		1.6	0.33	mg/Kg	4		6010B	Total/NA
Molybdenum	0.37	J	1.6	0.20	mg/Kg	4		6010B	Total/NA
Nickel	15		1.6	0.16	mg/Kg	4		6010B	Total/NA
Selenium	0.14	J	0.79	0.12	mg/Kg	1		6010B	Total/NA
Silver	0.21		0.20	0.040	mg/Kg	1		6010B	Total/NA
Thallium	0.24	J	0.40	0.12	mg/Kg	1		6010B	Total/NA
Vanadium	21		1.6	0.22	mg/Kg	4		6010B	Total/NA
Zinc	34		4.8	2.0	mg/Kg	4		6010B	Total/NA
Mercury	3.2		1.0	0.25	mg/Kg	100		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	5.95		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-26 — Lab Sample ID: 720-65322-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	4.5		3.4	0.29	mg/Kg	4		6010B	Total/NA
Barium	97		1.7	0.24	mg/Kg	4		6010B	Total/NA
Cadmium	0.16		0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	6.9		1.7	0.18	mg/Kg	4		6010B	Total/NA
Cobalt	4.4		0.68	0.068	mg/Kg	4		6010B	Total/NA
Copper	9.2		5.1	2.4	mg/Kg	4		6010B	Total/NA
Lead	17		1.7	0.36	mg/Kg	4		6010B	Total/NA
Molybdenum	0.49		0.42	0.054	mg/Kg	1		6010B	Total/NA
Nickel	15		1.7	0.17	mg/Kg	4		6010B	Total/NA
Selenium	0.17	J	0.85	0.13	mg/Kg	1		6010B	Total/NA
Silver	0.053	J	0.21	0.043	mg/Kg	1		6010B	Total/NA
Thallium	0.16	J	0.42	0.12	mg/Kg	1		6010B	Total/NA
Vanadium	20		1.7	0.23	mg/Kg	4		6010B	Total/NA
Zinc	34		5.1	2.2	mg/Kg	4		6010B	Total/NA
Mercury	14		0.88	0.22	mg/Kg	100		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	5.96		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-27 — Lab Sample ID: 720-65322-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	5.9		2.7	0.23	mg/Kg	4		6010B	Total/NA
Barium	87		1.4	0.19	mg/Kg	4		6010B	Total/NA
Cadmium	0.13		0.086	0.0085	mg/Kg	1		6010B	Total/NA
Chromium	8.6		1.4	0.15	mg/Kg	4		6010B	Total/NA
Cobalt	6.1		0.55	0.055	mg/Kg	4		6010B	Total/NA
Copper	9.4		4.1	2.0	mg/Kg	4		6010B	Total/NA
Lead	7.1		1.4	0.29	mg/Kg	4		6010B	Total/NA
Molybdenum	0.33	J	0.34	0.044	mg/Kg	1		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MM-S-27 (Continued) — Lab Sample ID: 720-65322-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nickel	21		1.4	0.14	mg/Kg	4		6010B	Total/NA
Silver	0.12	J	0.17	0.035	mg/Kg	1		6010B	Total/NA
Thallium	0.28	J	0.34	0.099	mg/Kg	1		6010B	Total/NA
Vanadium	28		1.4	0.19	mg/Kg	4		6010B	Total/NA
Zinc	37		4.1	1.7	mg/Kg	4		6010B	Total/NA
Mercury	0.61		0.045	0.011	mg/Kg	5		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	6.17		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-28 — Lab Sample ID: 720-65322-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	5.6		1.6	0.26	mg/Kg	4		6010B	Total/NA
Arsenic	25		3.1	0.27	mg/Kg	4		6010B	Total/NA
Barium	450		1.6	0.22	mg/Kg	4		6010B	Total/NA
Beryllium	0.039	J	0.079	0.026	mg/Kg	1		6010B	Total/NA
Cadmium	0.69		0.39	0.039	mg/Kg	4		6010B	Total/NA
Chromium	6.2		1.6	0.17	mg/Kg	4		6010B	Total/NA
Cobalt	5.2		0.63	0.063	mg/Kg	4		6010B	Total/NA
Copper	36		4.7	2.2	mg/Kg	4		6010B	Total/NA
Lead	97		1.6	0.33	mg/Kg	4		6010B	Total/NA
Molybdenum	2.0		1.6	0.20	mg/Kg	4		6010B	Total/NA
Nickel	13		1.6	0.16	mg/Kg	4		6010B	Total/NA
Selenium	1.5		0.79	0.12	mg/Kg	1		6010B	Total/NA
Silver	12		0.79	0.16	mg/Kg	4		6010B	Total/NA
Thallium	0.17	J	0.39	0.11	mg/Kg	1		6010B	Total/NA
Vanadium	19		1.6	0.21	mg/Kg	4		6010B	Total/NA
Zinc	74		4.7	2.0	mg/Kg	4		6010B	Total/NA
Mercury	42		0.92	0.23	mg/Kg	100		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	5.69		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-29 — Lab Sample ID: 720-65322-19

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.31	J	0.46	0.077	mg/Kg	1		6010B	Total/NA
Arsenic	4.6		3.7	0.31	mg/Kg	4		6010B	Total/NA
Barium	99		1.9	0.26	mg/Kg	4		6010B	Total/NA
Beryllium	0.18		0.093	0.030	mg/Kg	1		6010B	Total/NA
Cadmium	0.17		0.12	0.011	mg/Kg	1		6010B	Total/NA
Chromium	6.7		1.9	0.20	mg/Kg	4		6010B	Total/NA
Cobalt	4.8		0.74	0.074	mg/Kg	4		6010B	Total/NA
Copper	8.3		5.6	2.6	mg/Kg	4		6010B	Total/NA
Lead	11		1.9	0.39	mg/Kg	4		6010B	Total/NA
Molybdenum	0.52		0.46	0.059	mg/Kg	1		6010B	Total/NA
Nickel	14		1.9	0.19	mg/Kg	4		6010B	Total/NA
Silver	0.36		0.23	0.047	mg/Kg	1		6010B	Total/NA
Vanadium	21		1.9	0.25	mg/Kg	4		6010B	Total/NA
Zinc	33		5.6	2.4	mg/Kg	4		6010B	Total/NA
Mercury	2.1	B F1 F2	0.94	0.23	mg/Kg	100		7471A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MM-S-29 (Continued) — Lab Sample ID: 720-65322-19

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	5.91		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-30 — Lab Sample ID: 720-65322-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	5.4		1.7	0.27	mg/Kg	4		6010B	Total/NA
Arsenic	39		3.3	0.28	mg/Kg	4		6010B	Total/NA
Barium	520		1.7	0.23	mg/Kg	4		6010B	Total/NA
Cadmium	1.1		0.41	0.041	mg/Kg	4		6010B	Total/NA
Chromium	5.3		1.7	0.18	mg/Kg	4		6010B	Total/NA
Cobalt	3.9		0.66	0.066	mg/Kg	4		6010B	Total/NA
Copper	45		5.0	2.4	mg/Kg	4		6010B	Total/NA
Lead	110		1.7	0.35	mg/Kg	4		6010B	Total/NA
Molybdenum	1.8		1.7	0.21	mg/Kg	4		6010B	Total/NA
Nickel	12		1.7	0.17	mg/Kg	4		6010B	Total/NA
Selenium	2.4		0.83	0.12	mg/Kg	1		6010B	Total/NA
Silver	19		0.83	0.17	mg/Kg	4		6010B	Total/NA
Thallium	0.23	J	0.41	0.12	mg/Kg	1		6010B	Total/NA
Vanadium	17		1.7	0.22	mg/Kg	4		6010B	Total/NA
Zinc	110		5.0	2.1	mg/Kg	4		6010B	Total/NA
Mercury	120	B	0.98	0.25	mg/Kg	100		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	5.49		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-31 — Lab Sample ID: 720-65322-21

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	3.1		0.85	0.073	mg/Kg	1		6010B	Total/NA
Barium	73		1.7	0.24	mg/Kg	4		6010B	Total/NA
Cadmium	0.085	J	0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	6.1		1.7	0.18	mg/Kg	4		6010B	Total/NA
Cobalt	4.6		0.68	0.068	mg/Kg	4		6010B	Total/NA
Copper	5.1		5.1	2.4	mg/Kg	4		6010B	Total/NA
Lead	4.1		1.7	0.36	mg/Kg	4		6010B	Total/NA
Molybdenum	0.39	J	0.43	0.055	mg/Kg	1		6010B	Total/NA
Nickel	13		1.7	0.17	mg/Kg	4		6010B	Total/NA
Thallium	0.25	J	0.43	0.12	mg/Kg	1		6010B	Total/NA
Vanadium	21		1.7	0.23	mg/Kg	4		6010B	Total/NA
Zinc	37		5.1	2.2	mg/Kg	4		6010B	Total/NA
Mercury	0.88	J B	0.90	0.22	mg/Kg	100		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	5.64		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-32 — Lab Sample ID: 720-65322-22

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	4.2		1.3	0.22	mg/Kg	4		6010B	Total/NA
Arsenic	10		2.7	0.23	mg/Kg	4		6010B	Total/NA
Barium	390		1.3	0.19	mg/Kg	4		6010B	Total/NA
Cadmium	0.39		0.33	0.033	mg/Kg	4		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MM-S-32 (Continued) — Lab Sample ID: 720-65322-22

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	6.4		1.3	0.14	mg/Kg	4		6010B	Total/NA
Cobalt	3.9		0.53	0.053	mg/Kg	4		6010B	Total/NA
Copper	21		4.0	1.9	mg/Kg	4		6010B	Total/NA
Lead	50		1.3	0.28	mg/Kg	4		6010B	Total/NA
Molybdenum	0.73		0.33	0.043	mg/Kg	1		6010B	Total/NA
Nickel	14		1.3	0.14	mg/Kg	4		6010B	Total/NA
Selenium	0.59	J	0.67	0.10	mg/Kg	1		6010B	Total/NA
Silver	6.3		0.67	0.13	mg/Kg	4		6010B	Total/NA
Thallium	0.18	J	0.33	0.097	mg/Kg	1		6010B	Total/NA
Vanadium	15		1.3	0.18	mg/Kg	4		6010B	Total/NA
Zinc	64		4.0	1.7	mg/Kg	4		6010B	Total/NA
Mercury	140	B	0.87	0.22	mg/Kg	100		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	6.20		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-33 — Lab Sample ID: 720-65322-23

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	1.3		0.43	0.072	mg/Kg	1		6010B	Total/NA
Arsenic	8.4		3.4	0.29	mg/Kg	4		6010B	Total/NA
Barium	200		1.7	0.24	mg/Kg	4		6010B	Total/NA
Beryllium	0.28		0.086	0.028	mg/Kg	1		6010B	Total/NA
Cadmium	0.27		0.11	0.011	mg/Kg	1		6010B	Total/NA
Chromium	7.1	B	1.7	0.18	mg/Kg	4		6010B	Total/NA
Cobalt	5.0		0.69	0.069	mg/Kg	4		6010B	Total/NA
Copper	15		5.2	2.5	mg/Kg	4		6010B	Total/NA
Lead	49		1.7	0.36	mg/Kg	4		6010B	Total/NA
Molybdenum	1.8		1.7	0.22	mg/Kg	4		6010B	Total/NA
Nickel	12		1.7	0.18	mg/Kg	4		6010B	Total/NA
Selenium	0.21	J	0.86	0.13	mg/Kg	1		6010B	Total/NA
Silver	3.0		0.86	0.17	mg/Kg	4		6010B	Total/NA
Vanadium	18		1.7	0.23	mg/Kg	4		6010B	Total/NA
Zinc	63		5.2	2.2	mg/Kg	4		6010B	Total/NA
Mercury	14	B	0.90	0.22	mg/Kg	100		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	5.81		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-34 — Lab Sample ID: 720-65322-24

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.67		0.33	0.054	mg/Kg	1		6010B	Total/NA
Arsenic	6.8		2.6	0.22	mg/Kg	4		6010B	Total/NA
Barium	94		1.3	0.19	mg/Kg	4		6010B	Total/NA
Beryllium	0.33		0.26	0.085	mg/Kg	4		6010B	Total/NA
Cadmium	0.12		0.082	0.0081	mg/Kg	1		6010B	Total/NA
Chromium	9.1	B	1.3	0.14	mg/Kg	4		6010B	Total/NA
Cobalt	6.9		0.52	0.052	mg/Kg	4		6010B	Total/NA
Copper	8.8		3.9	1.9	mg/Kg	4		6010B	Total/NA
Lead	8.7		1.3	0.27	mg/Kg	4		6010B	Total/NA
Molybdenum	0.79		0.33	0.042	mg/Kg	1		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-34 (Continued) — Lab Sample ID: 720-65322-24

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nickel	19		1.3	0.13	mg/Kg	4		6010B	Total/NA
Silver	0.68		0.65	0.13	mg/Kg	4		6010B	Total/NA
Vanadium	24		1.3	0.18	mg/Kg	4		6010B	Total/NA
Zinc	40		3.9	1.7	mg/Kg	4		6010B	Total/NA
Mercury	4.0	B	0.85	0.21	mg/Kg	100		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	5.84		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-35 — Lab Sample ID: 720-65322-25

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	6.6		2.0	0.33	mg/Kg	4		6010B	Total/NA
Arsenic	24		3.9	0.33	mg/Kg	4		6010B	Total/NA
Barium	630		2.0	0.28	mg/Kg	4		6010B	Total/NA
Beryllium	0.19		0.098	0.032	mg/Kg	1		6010B	Total/NA
Cadmium	0.78		0.49	0.049	mg/Kg	4		6010B	Total/NA
Chromium	6.5	B	2.0	0.21	mg/Kg	4		6010B	Total/NA
Cobalt	3.9		0.78	0.078	mg/Kg	4		6010B	Total/NA
Copper	33		5.9	2.8	mg/Kg	4		6010B	Total/NA
Lead	98		2.0	0.41	mg/Kg	4		6010B	Total/NA
Molybdenum	2.1		2.0	0.25	mg/Kg	4		6010B	Total/NA
Nickel	13		2.0	0.20	mg/Kg	4		6010B	Total/NA
Selenium	1.3		0.98	0.15	mg/Kg	1		6010B	Total/NA
Silver	9.8		0.98	0.20	mg/Kg	4		6010B	Total/NA
Vanadium	20		2.0	0.27	mg/Kg	4		6010B	Total/NA
Zinc	79		5.9	2.5	mg/Kg	4		6010B	Total/NA
Mercury	72	B	0.90	0.22	mg/Kg	100		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	5.94		0.100	0.100	SU	1		9045C	Soluble

Client Sample ID: MM-S-36 — Lab Sample ID: 720-65322-26

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.57		0.38	0.064	mg/Kg	1		6010B	Total/NA
Arsenic	4.3		3.1	0.26	mg/Kg	4		6010B	Total/NA
Barium	85		1.5	0.22	mg/Kg	4		6010B	Total/NA
Beryllium	0.15		0.077	0.025	mg/Kg	1		6010B	Total/NA
Cadmium	0.15		0.096	0.0095	mg/Kg	1		6010B	Total/NA
Chromium	6.8	B	1.5	0.16	mg/Kg	4		6010B	Total/NA
Cobalt	3.7		0.62	0.062	mg/Kg	4		6010B	Total/NA
Copper	8.5		4.6	2.2	mg/Kg	4		6010B	Total/NA
Lead	12		1.5	0.32	mg/Kg	4		6010B	Total/NA
Molybdenum	0.45		0.38	0.049	mg/Kg	1		6010B	Total/NA
Nickel	10		1.5	0.16	mg/Kg	4		6010B	Total/NA
Silver	0.30		0.19	0.039	mg/Kg	1		6010B	Total/NA
Vanadium	17		1.5	0.21	mg/Kg	4		6010B	Total/NA
Zinc	40		4.6	2.0	mg/Kg	4		6010B	Total/NA
Mercury	0.62	B	0.0091	0.0023	mg/Kg	1		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	5.42		0.100	0.100	SU	1		9045C	Soluble

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-37 — Lab Sample ID: 720-65322-27

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.98		0.49	0.081	mg/Kg	1		6010B	Total/NA
Arsenic	6.4		3.9	0.33	mg/Kg	4		6010B	Total/NA
Barium	91		1.9	0.28	mg/Kg	4		6010B	Total/NA
Beryllium	0.13		0.097	0.032	mg/Kg	1		6010B	Total/NA
Cadmium	0.15		0.12	0.012	mg/Kg	1		6010B	Total/NA
Chromium	5.4	B	1.9	0.21	mg/Kg	4		6010B	Total/NA
Cobalt	4.1		0.78	0.078	mg/Kg	4		6010B	Total/NA
Copper	17		5.8	2.8	mg/Kg	4		6010B	Total/NA
Lead	240		1.9	0.41	mg/Kg	4		6010B	Total/NA
Molybdenum	0.42	J	0.49	0.062	mg/Kg	1		6010B	Total/NA
Nickel	7.8		1.9	0.20	mg/Kg	4		6010B	Total/NA
Silver	1.5		0.97	0.20	mg/Kg	4		6010B	Total/NA
Vanadium	13		1.9	0.26	mg/Kg	4		6010B	Total/NA
Zinc	63		5.8	2.5	mg/Kg	4		6010B	Total/NA
Mercury	2.0	B	0.88	0.22	mg/Kg	100		7471A	Total/NA
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	5.36		0.100	0.100	SU	1		9045C	Soluble

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-SD-04

Date Collected: 06/02/15 14:10
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-1

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.93	B	0.36	0.059	mg/Kg		06/09/15 17:56	06/11/15 12:19	1
Arsenic	8.7		2.9	0.24	mg/Kg		06/09/15 17:56	06/11/15 00:43	4
Barium	280		1.4	0.20	mg/Kg		06/09/15 17:56	06/11/15 00:43	4
Beryllium	0.12		0.071	0.023	mg/Kg		06/09/15 17:56	06/11/15 12:19	1
Cadmium	1.2		0.36	0.035	mg/Kg		06/09/15 17:56	06/11/15 00:43	4
Chromium	8.3		1.4	0.15	mg/Kg		06/09/15 17:56	06/11/15 00:43	4
Cobalt	7.0		0.57	0.057	mg/Kg		06/09/15 17:56	06/11/15 00:43	4
Copper	19		4.3	2.0	mg/Kg		06/09/15 17:56	06/11/15 00:43	4
Lead	46		1.4	0.30	mg/Kg		06/09/15 17:56	06/11/15 00:43	4
Molybdenum	0.36		0.36	0.046	mg/Kg		06/09/15 17:56	06/11/15 12:19	1
Nickel	28		1.4	0.15	mg/Kg		06/09/15 17:56	06/11/15 00:43	4
Selenium	0.23	J	0.71	0.11	mg/Kg		06/09/15 17:56	06/11/15 12:19	1
Silver	4.6		0.71	0.14	mg/Kg		06/09/15 17:56	06/11/15 00:43	4
Thallium	ND		0.36	0.10	mg/Kg		06/09/15 17:56	06/11/15 12:19	1
Vanadium	25		1.4	0.19	mg/Kg		06/09/15 17:56	06/11/15 00:43	4
Zinc	140		4.3	1.8	mg/Kg		06/09/15 17:56	06/11/15 00:43	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	3.6		0.042	0.011	mg/Kg		06/10/15 19:24	06/12/15 20:40	5

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.91		0.100	0.100	SU			06/09/15 16:28	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-SD-05

Date Collected: 06/02/15 14:25
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-2

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	2.4	B	1.6	0.27	mg/Kg		06/09/15 17:56	06/11/15 00:48	4
Arsenic	8.9		3.2	0.27	mg/Kg		06/09/15 17:56	06/11/15 00:48	4
Barium	210		1.6	0.23	mg/Kg		06/09/15 17:56	06/11/15 00:48	4
Beryllium	0.14		0.081	0.026	mg/Kg		06/09/15 17:56	06/11/15 12:24	1
Cadmium	0.29		0.10	0.010	mg/Kg		06/09/15 17:56	06/11/15 12:24	1
Chromium	10		1.6	0.17	mg/Kg		06/09/15 17:56	06/11/15 00:48	4
Cobalt	7.2		0.65	0.065	mg/Kg		06/09/15 17:56	06/11/15 00:48	4
Copper	30		4.8	2.3	mg/Kg		06/09/15 17:56	06/11/15 00:48	4
Lead	130		1.6	0.34	mg/Kg		06/09/15 17:56	06/11/15 00:48	4
Molybdenum	0.40		0.40	0.052	mg/Kg		06/09/15 17:56	06/11/15 12:24	1
Nickel	23		1.6	0.16	mg/Kg		06/09/15 17:56	06/11/15 00:48	4
Selenium	0.29	J	0.81	0.12	mg/Kg		06/09/15 17:56	06/11/15 12:24	1
Silver	4.5		0.81	0.16	mg/Kg		06/09/15 17:56	06/11/15 00:48	4
Thallium	ND		0.40	0.12	mg/Kg		06/09/15 17:56	06/11/15 12:24	1
Vanadium	27		1.6	0.22	mg/Kg		06/09/15 17:56	06/11/15 00:48	4
Zinc	59		4.8	2.0	mg/Kg		06/09/15 17:56	06/11/15 00:48	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	64		1.0	0.25	mg/Kg		06/10/15 19:24	06/12/15 20:43	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.25		0.100	0.100	SU			06/09/15 16:34	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-SD-06

Date Collected: 06/02/15 14:35
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-3

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	2.7	B	1.7	0.29	mg/Kg		06/09/15 17:56	06/11/15 00:52	4
Arsenic	16		3.4	0.29	mg/Kg		06/09/15 17:56	06/11/15 00:52	4
Barium	270		1.7	0.24	mg/Kg		06/09/15 17:56	06/11/15 00:52	4
Beryllium	0.19		0.086	0.028	mg/Kg		06/09/15 17:56	06/11/15 12:29	1
Cadmium	0.93		0.43	0.043	mg/Kg		06/09/15 17:56	06/11/15 00:52	4
Chromium	10		1.7	0.18	mg/Kg		06/09/15 17:56	06/11/15 00:52	4
Cobalt	6.9		0.69	0.069	mg/Kg		06/09/15 17:56	06/11/15 00:52	4
Copper	78		5.2	2.5	mg/Kg		06/09/15 17:56	06/11/15 00:52	4
Lead	180		1.7	0.36	mg/Kg		06/09/15 17:56	06/11/15 00:52	4
Molybdenum	0.71		0.43	0.055	mg/Kg		06/09/15 17:56	06/11/15 12:29	1
Nickel	24		1.7	0.18	mg/Kg		06/09/15 17:56	06/11/15 00:52	4
Selenium	0.77	J	0.86	0.13	mg/Kg		06/09/15 17:56	06/11/15 12:29	1
Silver	19		0.86	0.17	mg/Kg		06/09/15 17:56	06/11/15 00:52	4
Thallium	ND		0.43	0.13	mg/Kg		06/09/15 17:56	06/11/15 12:29	1
Vanadium	29		1.7	0.23	mg/Kg		06/09/15 17:56	06/11/15 00:52	4
Zinc	99		5.2	2.2	mg/Kg		06/09/15 17:56	06/11/15 00:52	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	740		8.5	2.1	mg/Kg		06/10/15 19:24	06/12/15 21:05	1000

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.86		0.100	0.100	SU			06/09/15 16:36	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-SD-07

Date Collected: 06/02/15 14:45
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-4

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	6.2	F1	1.7	0.28	mg/Kg		06/09/15 18:43	06/10/15 11:39	4
Arsenic	17		3.4	0.29	mg/Kg		06/09/15 18:43	06/10/15 11:39	4
Barium	400		1.7	0.24	mg/Kg		06/09/15 18:43	06/10/15 11:39	4
Beryllium	0.14		0.085	0.028	mg/Kg		06/09/15 18:43	06/10/15 20:57	1
Cadmium	1.4		0.43	0.042	mg/Kg		06/09/15 18:43	06/10/15 11:39	4
Chromium	6.4		1.7	0.18	mg/Kg		06/09/15 18:43	06/10/15 11:39	4
Cobalt	4.7		0.68	0.068	mg/Kg		06/09/15 18:43	06/10/15 11:39	4
Copper	85		5.1	2.4	mg/Kg		06/09/15 18:43	06/10/15 11:39	4
Lead	360		1.7	0.36	mg/Kg		06/09/15 18:43	06/10/15 11:39	4
Molybdenum	1.8		1.7	0.22	mg/Kg		06/09/15 18:43	06/10/15 11:39	4
Nickel	12		1.7	0.17	mg/Kg		06/09/15 18:43	06/10/15 11:39	4
Selenium	2.0		0.85	0.13	mg/Kg		06/09/15 18:43	06/10/15 20:57	1
Silver	17		0.85	0.17	mg/Kg		06/09/15 18:43	06/10/15 11:39	4
Thallium	0.15	J	0.43	0.12	mg/Kg		06/09/15 18:43	06/10/15 20:57	1
Vanadium	17		1.7	0.23	mg/Kg		06/09/15 18:43	06/10/15 11:39	4
Zinc	100		5.1	2.2	mg/Kg		06/09/15 18:43	06/10/15 11:39	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	410		10	2.5	mg/Kg		06/10/15 19:24	06/12/15 21:07	1000

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.05		0.100	0.100	SU			06/09/15 16:38	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-SD-08

Date Collected: 06/02/15 14:55
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-5

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.26	J	0.30	0.050	mg/Kg		06/09/15 18:43	06/10/15 21:02	1
Arsenic	5.7		2.4	0.21	mg/Kg		06/09/15 18:43	06/10/15 11:44	4
Barium	86		1.2	0.17	mg/Kg		06/09/15 18:43	06/10/15 11:44	4
Beryllium	ND		0.061	0.020	mg/Kg		06/09/15 18:43	06/10/15 21:02	1
Cadmium	0.24		0.076	0.0075	mg/Kg		06/09/15 18:43	06/10/15 21:02	1
Chromium	8.0		1.2	0.13	mg/Kg		06/09/15 18:43	06/10/15 11:44	4
Cobalt	3.0		0.48	0.048	mg/Kg		06/09/15 18:43	06/10/15 11:44	4
Copper	7.0		3.6	1.7	mg/Kg		06/09/15 18:43	06/10/15 11:44	4
Lead	6.1		1.2	0.25	mg/Kg		06/09/15 18:43	06/10/15 11:44	4
Molybdenum	0.39		0.30	0.039	mg/Kg		06/09/15 18:43	06/10/15 21:02	1
Nickel	8.5		1.2	0.12	mg/Kg		06/09/15 18:43	06/10/15 11:44	4
Selenium	ND		0.61	0.091	mg/Kg		06/09/15 18:43	06/10/15 21:02	1
Silver	0.23		0.15	0.031	mg/Kg		06/09/15 18:43	06/10/15 21:02	1
Thallium	0.20	J	0.30	0.088	mg/Kg		06/09/15 18:43	06/10/15 21:02	1
Vanadium	23		1.2	0.16	mg/Kg		06/09/15 18:43	06/10/15 11:44	4
Zinc	38		3.6	1.5	mg/Kg		06/09/15 18:43	06/10/15 11:44	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.50		0.043	0.011	mg/Kg		06/10/15 19:24	06/12/15 22:03	5

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.01		0.100	0.100	SU			06/09/15 16:40	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-16

Date Collected: 06/03/15 09:40
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-6

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.36	0.059	mg/Kg		06/09/15 18:43	06/10/15 21:07	1
Arsenic	**6.1**		2.9	0.24	mg/Kg		06/09/15 18:43	06/10/15 11:48	4
Barium	**88**		1.4	0.20	mg/Kg		06/09/15 18:43	06/10/15 11:48	4
Beryllium	**0.17**		0.071	0.023	mg/Kg		06/09/15 18:43	06/10/15 21:07	1
Cadmium	**0.11**		0.089	0.0089	mg/Kg		06/09/15 18:43	06/10/15 21:07	1
Chromium	**6.5**		1.4	0.15	mg/Kg		06/09/15 18:43	06/10/15 11:48	4
Cobalt	**4.3**		0.57	0.057	mg/Kg		06/09/15 18:43	06/10/15 11:48	4
Copper	**6.7**		4.3	2.0	mg/Kg		06/09/15 18:43	06/10/15 11:48	4
Lead	**8.8**		1.4	0.30	mg/Kg		06/09/15 18:43	06/10/15 11:48	4
Molybdenum	**0.45**		0.36	0.046	mg/Kg		06/09/15 18:43	06/10/15 21:07	1
Nickel	**12**		1.4	0.15	mg/Kg		06/09/15 18:43	06/10/15 11:48	4
Selenium	ND		0.71	0.11	mg/Kg		06/09/15 18:43	06/10/15 21:07	1
Silver	**0.31**		0.18	0.036	mg/Kg		06/09/15 18:43	06/10/15 21:07	1
Thallium	**0.20**	**J**	0.36	0.10	mg/Kg		06/09/15 18:43	06/10/15 21:07	1
Vanadium	**18**		1.4	0.19	mg/Kg		06/09/15 18:43	06/10/15 11:48	4
Zinc	**29**		4.3	1.8	mg/Kg		06/09/15 18:43	06/10/15 11:48	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.75**		0.045	0.011	mg/Kg		06/10/15 19:24	06/12/15 22:05	5

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.09**		0.100	0.100	SU			06/09/15 16:46	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-17

Date Collected: 06/03/15 09:50
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-7

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.38	0.064	mg/Kg		06/09/15 18:43	06/10/15 21:12	1
Arsenic	**7.4**		3.1	0.26	mg/Kg		06/09/15 18:43	06/10/15 12:02	4
Barium	**110**		1.5	0.22	mg/Kg		06/09/15 18:43	06/10/15 12:02	4
Beryllium	ND		0.077	0.025	mg/Kg		06/09/15 18:43	06/10/15 21:12	1
Cadmium	**0.083**	**J**	0.096	0.0095	mg/Kg		06/09/15 18:43	06/10/15 21:12	1
Chromium	**7.1**		1.5	0.16	mg/Kg		06/09/15 18:43	06/10/15 12:02	4
Cobalt	**5.8**		0.62	0.062	mg/Kg		06/09/15 18:43	06/10/15 12:02	4
Copper	**8.5**		4.6	2.2	mg/Kg		06/09/15 18:43	06/10/15 12:02	4
Lead	**5.6**		1.5	0.32	mg/Kg		06/09/15 18:43	06/10/15 12:02	4
Molybdenum	**0.28**	**J**	0.38	0.049	mg/Kg		06/09/15 18:43	06/10/15 21:12	1
Nickel	**16**		1.5	0.16	mg/Kg		06/09/15 18:43	06/10/15 12:02	4
Selenium	ND		0.77	0.12	mg/Kg		06/09/15 18:43	06/10/15 21:12	1
Silver	**0.098**	**J**	0.19	0.039	mg/Kg		06/09/15 18:43	06/10/15 21:12	1
Thallium	**0.17**	**J**	0.38	0.11	mg/Kg		06/09/15 18:43	06/10/15 21:12	1
Vanadium	**26**		1.5	0.21	mg/Kg		06/09/15 18:43	06/10/15 12:02	4
Zinc	**29**		4.6	2.0	mg/Kg		06/09/15 18:43	06/10/15 12:02	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.55**		0.045	0.011	mg/Kg		06/10/15 19:24	06/12/15 22:07	5

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.16**		0.100	0.100	SU			06/09/15 16:50	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-18

Date Collected: 06/03/15 10:00
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-8

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	1.3		0.46	0.076	mg/Kg		06/09/15 18:43	06/10/15 21:16	1
Arsenic	30		3.7	0.31	mg/Kg		06/09/15 18:43	06/10/15 12:07	4
Barium	260		1.8	0.26	mg/Kg		06/09/15 18:43	06/10/15 12:07	4
Beryllium	ND		0.092	0.030	mg/Kg		06/09/15 18:43	06/10/15 21:16	1
Cadmium	0.34		0.11	0.011	mg/Kg		06/09/15 18:43	06/10/15 21:16	1
Chromium	9.0		1.8	0.19	mg/Kg		06/09/15 18:43	06/10/15 12:07	4
Cobalt	7.4		0.73	0.073	mg/Kg		06/09/15 18:43	06/10/15 12:07	4
Copper	21		5.5	2.6	mg/Kg		06/09/15 18:43	06/10/15 12:07	4
Lead	91		1.8	0.39	mg/Kg		06/09/15 18:43	06/10/15 12:07	4
Molybdenum	0.47		0.46	0.059	mg/Kg		06/09/15 18:43	06/10/15 21:16	1
Nickel	28		1.8	0.19	mg/Kg		06/09/15 18:43	06/10/15 12:07	4
Selenium	0.28	J	0.92	0.14	mg/Kg		06/09/15 18:43	06/10/15 21:16	1
Silver	2.3		0.92	0.19	mg/Kg		06/09/15 18:43	06/10/15 12:07	4
Thallium	0.27	J	0.46	0.13	mg/Kg		06/09/15 18:43	06/10/15 21:16	1
Vanadium	24		1.8	0.25	mg/Kg		06/09/15 18:43	06/10/15 12:07	4
Zinc	75		5.5	2.3	mg/Kg		06/09/15 18:43	06/10/15 12:07	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	1.8		1.0	0.25	mg/Kg		06/10/15 19:24	06/12/15 21:17	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.61		0.100	0.100	SU			06/09/15 16:52	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-19

Date Collected: 06/03/15 10:10
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-9

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	1.0		0.46	0.077	mg/Kg		06/09/15 18:43	06/10/15 21:21	1
Arsenic	11		3.7	0.31	mg/Kg		06/09/15 18:43	06/10/15 12:12	4
Barium	290		1.9	0.26	mg/Kg		06/09/15 18:43	06/10/15 12:12	4
Beryllium	ND		0.093	0.030	mg/Kg		06/09/15 18:43	06/10/15 21:21	1
Cadmium	0.28		0.12	0.011	mg/Kg		06/09/15 18:43	06/10/15 21:21	1
Chromium	9.9		1.9	0.20	mg/Kg		06/09/15 18:43	06/10/15 12:12	4
Cobalt	8.6		0.74	0.074	mg/Kg		06/09/15 18:43	06/10/15 12:12	4
Copper	18		5.6	2.6	mg/Kg		06/09/15 18:43	06/10/15 12:12	4
Lead	51		1.9	0.39	mg/Kg		06/09/15 18:43	06/10/15 12:12	4
Molybdenum	0.53		0.46	0.059	mg/Kg		06/09/15 18:43	06/10/15 21:21	1
Nickel	30		1.9	0.19	mg/Kg		06/09/15 18:43	06/10/15 12:12	4
Selenium	0.17	J	0.93	0.14	mg/Kg		06/09/15 18:43	06/10/15 21:21	1
Silver	3.1		0.93	0.19	mg/Kg		06/09/15 18:43	06/10/15 12:12	4
Thallium	0.29	J	0.46	0.13	mg/Kg		06/09/15 18:43	06/10/15 21:21	1
Vanadium	29		1.9	0.25	mg/Kg		06/09/15 18:43	06/10/15 12:12	4
Zinc	77		5.6	2.4	mg/Kg		06/09/15 18:43	06/10/15 12:12	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	4.0		0.92	0.23	mg/Kg		06/10/15 19:24	06/12/15 21:19	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.91		0.100	0.100	SU			06/09/15 16:53	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-20

Date Collected: 06/03/15 10:25
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-10

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.47		0.45	0.074	mg/Kg		06/09/15 18:43	06/10/15 21:26	1
Arsenic	9.6		3.6	0.30	mg/Kg		06/09/15 18:43	06/10/15 12:16	4
Barium	97		1.8	0.25	mg/Kg		06/09/15 18:43	06/10/15 12:16	4
Beryllium	0.031	J	0.089	0.029	mg/Kg		06/09/15 18:43	06/10/15 21:26	1
Cadmium	0.11		0.11	0.011	mg/Kg		06/09/15 18:43	06/10/15 21:26	1
Chromium	8.0		1.8	0.19	mg/Kg		06/09/15 18:43	06/10/15 12:16	4
Cobalt	4.3		0.71	0.071	mg/Kg		06/09/15 18:43	06/10/15 12:16	4
Copper	11		5.4	2.5	mg/Kg		06/09/15 18:43	06/10/15 12:16	4
Lead	170		1.8	0.38	mg/Kg		06/09/15 18:43	06/10/15 12:16	4
Molybdenum	0.58		0.45	0.057	mg/Kg		06/09/15 18:43	06/10/15 21:26	1
Nickel	9.1		1.8	0.18	mg/Kg		06/09/15 18:43	06/10/15 12:16	4
Selenium	0.25	J	0.89	0.13	mg/Kg		06/09/15 18:43	06/10/15 21:26	1
Silver	2.7		0.89	0.18	mg/Kg		06/09/15 18:43	06/10/15 12:16	4
Thallium	0.17	J	0.45	0.13	mg/Kg		06/09/15 18:43	06/10/15 21:26	1
Vanadium	16		1.8	0.24	mg/Kg		06/09/15 18:43	06/10/15 12:16	4
Zinc	36		5.4	2.3	mg/Kg		06/09/15 18:43	06/10/15 12:16	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	9.3		0.92	0.23	mg/Kg		06/10/15 19:24	06/12/15 21:22	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.53		0.100	0.100	SU			06/09/15 16:56	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-21

Date Collected: 06/03/15 10:35
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-11

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.45	0.075	mg/Kg		06/09/15 18:43	06/10/15 21:31	1
Arsenic	**6.4**		3.6	0.31	mg/Kg		06/09/15 18:43	06/10/15 12:21	4
Barium	**87**		1.8	0.26	mg/Kg		06/09/15 18:43	06/10/15 12:21	4
Beryllium	ND		0.091	0.030	mg/Kg		06/09/15 18:43	06/10/15 21:31	1
Cadmium	**0.086**	**J**	0.11	0.011	mg/Kg		06/09/15 18:43	06/10/15 21:31	1
Chromium	**5.2**		1.8	0.19	mg/Kg		06/09/15 18:43	06/10/15 12:21	4
Cobalt	**3.7**		0.73	0.073	mg/Kg		06/09/15 18:43	06/10/15 12:21	4
Copper	**6.0**		5.5	2.6	mg/Kg		06/09/15 18:43	06/10/15 12:21	4
Lead	**8.3**		1.8	0.38	mg/Kg		06/09/15 18:43	06/10/15 12:21	4
Molybdenum	**0.52**		0.45	0.058	mg/Kg		06/09/15 18:43	06/10/15 21:31	1
Nickel	**8.4**		1.8	0.19	mg/Kg		06/09/15 18:43	06/10/15 12:21	4
Selenium	ND		0.91	0.14	mg/Kg		06/09/15 18:43	06/10/15 21:31	1
Silver	**0.13**	**J**	0.23	0.046	mg/Kg		06/09/15 18:43	06/10/15 21:31	1
Thallium	**0.21**	**J**	0.45	0.13	mg/Kg		06/09/15 18:43	06/10/15 21:31	1
Vanadium	**17**		1.8	0.25	mg/Kg		06/09/15 18:43	06/10/15 12:21	4
Zinc	**31**		5.5	2.3	mg/Kg		06/09/15 18:43	06/10/15 12:21	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.77**		0.049	0.012	mg/Kg		06/10/15 19:24	06/12/15 22:10	5

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.37**		0.100	0.100	SU			06/09/15 16:59	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-22

Date Collected: 06/03/15 11:00
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-12

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.42	0.070	mg/Kg		06/09/15 18:43	06/10/15 21:35	1
Arsenic	**4.6**		3.4	0.29	mg/Kg		06/09/15 18:43	06/10/15 12:26	4
Barium	**74**		1.7	0.24	mg/Kg		06/09/15 18:43	06/10/15 12:26	4
Beryllium	**0.036**	**J**	0.085	0.028	mg/Kg		06/09/15 18:43	06/10/15 21:35	1
Cadmium	**0.14**		0.11	0.011	mg/Kg		06/09/15 18:43	06/10/15 21:35	1
Chromium	**4.5**		1.7	0.18	mg/Kg		06/09/15 18:43	06/10/15 12:26	4
Cobalt	**4.2**		0.68	0.068	mg/Kg		06/09/15 18:43	06/10/15 12:26	4
Copper	**11**		5.1	2.4	mg/Kg		06/09/15 18:43	06/10/15 12:26	4
Lead	**17**		1.7	0.36	mg/Kg		06/09/15 18:43	06/10/15 12:26	4
Molybdenum	**0.78**		0.42	0.054	mg/Kg		06/09/15 18:43	06/10/15 21:35	1
Nickel	**9.4**		1.7	0.17	mg/Kg		06/09/15 18:43	06/10/15 12:26	4
Selenium	ND		0.85	0.13	mg/Kg		06/09/15 18:43	06/10/15 21:35	1
Silver	**0.19**	**J**	0.21	0.043	mg/Kg		06/09/15 18:43	06/10/15 21:35	1
Thallium	ND		0.42	0.12	mg/Kg		06/09/15 18:43	06/10/15 21:35	1
Vanadium	**12**		1.7	0.23	mg/Kg		06/09/15 18:43	06/10/15 12:26	4
Zinc	**20**		5.1	2.2	mg/Kg		06/09/15 18:43	06/10/15 12:26	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.58**		0.048	0.012	mg/Kg		06/10/15 19:24	06/12/15 22:13	5

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.83**		0.100	0.100	SU			06/09/15 17:03	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-23

Lab Sample ID: 720-65322-13

Date Collected: 06/03/15 11:05
Matrix: Solid
Date Received: 06/08/15 15:30

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.44	0.073	mg/Kg		06/09/15 18:43	06/10/15 21:40	1
Arsenic	**6.4**		3.5	0.30	mg/Kg		06/09/15 18:43	06/10/15 12:30	4
Barium	**84**		1.8	0.25	mg/Kg		06/09/15 18:43	06/10/15 12:30	4
Beryllium	ND		0.088	0.029	mg/Kg		06/09/15 18:43	06/10/15 21:40	1
Cadmium	**0.20**		0.11	0.011	mg/Kg		06/09/15 18:43	06/10/15 21:40	1
Chromium	**9.2**		1.8	0.19	mg/Kg		06/09/15 18:43	06/10/15 12:30	4
Cobalt	**3.2**		0.71	0.071	mg/Kg		06/09/15 18:43	06/10/15 12:30	4
Copper	**11**		5.3	2.5	mg/Kg		06/09/15 18:43	06/10/15 12:30	4
Lead	**9.6**		1.8	0.37	mg/Kg		06/09/15 18:43	06/10/15 12:30	4
Molybdenum	**0.55**		0.44	0.057	mg/Kg		06/09/15 18:43	06/10/15 21:40	1
Nickel	**9.4**		1.8	0.18	mg/Kg		06/09/15 18:43	06/10/15 12:30	4
Selenium	**0.16**	**J**	0.88	0.13	mg/Kg		06/09/15 18:43	06/10/15 21:40	1
Silver	**0.89**		0.88	0.18	mg/Kg		06/09/15 18:43	06/10/15 12:30	4
Thallium	ND		0.44	0.13	mg/Kg		06/09/15 18:43	06/10/15 21:40	1
Vanadium	**20**		1.8	0.24	mg/Kg		06/09/15 18:43	06/10/15 12:30	4
Zinc	**39**		5.3	2.2	mg/Kg		06/09/15 18:43	06/10/15 12:30	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**8.7**		0.94	0.23	mg/Kg		06/10/15 19:24	06/12/15 21:34	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.89**		0.100	0.100	SU			06/09/15 17:05	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-24

Date Collected: 06/03/15 11:15
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-14

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	5.8		1.7	0.28	mg/Kg		06/09/15 18:43	06/10/15 12:35	4
Arsenic	30		3.4	0.29	mg/Kg		06/09/15 18:43	06/10/15 12:35	4
Barium	720		1.7	0.24	mg/Kg		06/09/15 18:43	06/10/15 12:35	4
Beryllium	0.029	J	0.085	0.028	mg/Kg		06/09/15 18:43	06/10/15 21:54	1
Cadmium	1.3		0.43	0.042	mg/Kg		06/09/15 18:43	06/10/15 12:35	4
Chromium	5.3		1.7	0.18	mg/Kg		06/09/15 18:43	06/10/15 12:35	4
Cobalt	4.1		0.68	0.068	mg/Kg		06/09/15 18:43	06/10/15 12:35	4
Copper	42		5.1	2.4	mg/Kg		06/09/15 18:43	06/10/15 12:35	4
Lead	93		1.7	0.36	mg/Kg		06/09/15 18:43	06/10/15 12:35	4
Molybdenum	1.9		1.7	0.22	mg/Kg		06/09/15 18:43	06/10/15 12:35	4
Nickel	9.5		1.7	0.17	mg/Kg		06/09/15 18:43	06/10/15 12:35	4
Selenium	2.2		0.85	0.13	mg/Kg		06/09/15 18:43	06/10/15 21:54	1
Silver	15		0.85	0.17	mg/Kg		06/09/15 18:43	06/10/15 12:35	4
Thallium	0.19	J	0.43	0.12	mg/Kg		06/09/15 18:43	06/10/15 21:54	1
Vanadium	15		1.7	0.23	mg/Kg		06/09/15 18:43	06/10/15 12:35	4
Zinc	130		5.1	2.2	mg/Kg		06/09/15 18:43	06/10/15 12:35	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	120		0.94	0.23	mg/Kg		06/10/15 19:24	06/12/15 21:36	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.39		0.100	0.100	SU			06/09/15 17:07	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-25

Date Collected: 06/03/15 11:25
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-15

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.40	0.066	mg/Kg		06/09/15 18:43	06/10/15 21:59	1
Arsenic	**4.4**		3.2	0.27	mg/Kg		06/09/15 18:43	06/10/15 12:39	4
Barium	**76**		1.6	0.23	mg/Kg		06/09/15 18:43	06/10/15 12:39	4
Beryllium	ND		0.079	0.026	mg/Kg		06/09/15 18:43	06/10/15 21:59	1
Cadmium	**0.12**		0.099	0.0098	mg/Kg		06/09/15 18:43	06/10/15 21:59	1
Chromium	**6.9**		1.6	0.17	mg/Kg		06/09/15 18:43	06/10/15 12:39	4
Cobalt	**4.8**		0.63	0.063	mg/Kg		06/09/15 18:43	06/10/15 12:39	4
Copper	**6.2**		4.8	2.3	mg/Kg		06/09/15 18:43	06/10/15 12:39	4
Lead	**10**		1.6	0.33	mg/Kg		06/09/15 18:43	06/10/15 12:39	4
Molybdenum	**0.37**	**J**	1.6	0.20	mg/Kg		06/09/15 18:43	06/10/15 12:39	4
Nickel	**15**		1.6	0.16	mg/Kg		06/09/15 18:43	06/10/15 12:39	4
Selenium	**0.14**	**J**	0.79	0.12	mg/Kg		06/09/15 18:43	06/10/15 21:59	1
Silver	**0.21**		0.20	0.040	mg/Kg		06/09/15 18:43	06/10/15 21:59	1
Thallium	**0.24**	**J**	0.40	0.12	mg/Kg		06/09/15 18:43	06/10/15 21:59	1
Vanadium	**21**		1.6	0.22	mg/Kg		06/09/15 18:43	06/10/15 12:39	4
Zinc	**34**		4.8	2.0	mg/Kg		06/09/15 18:43	06/10/15 12:39	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**3.2**		1.0	0.25	mg/Kg		06/10/15 19:24	06/12/15 21:39	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.95**		0.100	0.100	SU			06/09/15 17:09	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-26

Date Collected: 06/03/15 11:35
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-16

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.42	0.070	mg/Kg		06/09/15 18:43	06/10/15 22:04	1
Arsenic	**4.5**		3.4	0.29	mg/Kg		06/09/15 18:43	06/10/15 12:44	4
Barium	**97**		1.7	0.24	mg/Kg		06/09/15 18:43	06/10/15 12:44	4
Beryllium	ND		0.085	0.028	mg/Kg		06/09/15 18:43	06/10/15 22:04	1
Cadmium	**0.16**		0.11	0.011	mg/Kg		06/09/15 18:43	06/10/15 22:04	1
Chromium	**6.9**		1.7	0.18	mg/Kg		06/09/15 18:43	06/10/15 12:44	4
Cobalt	**4.4**		0.68	0.068	mg/Kg		06/09/15 18:43	06/10/15 12:44	4
Copper	**9.2**		5.1	2.4	mg/Kg		06/09/15 18:43	06/10/15 12:44	4
Lead	**17**		1.7	0.36	mg/Kg		06/09/15 18:43	06/10/15 12:44	4
Molybdenum	**0.49**		0.42	0.054	mg/Kg		06/09/15 18:43	06/10/15 22:04	1
Nickel	**15**		1.7	0.17	mg/Kg		06/09/15 18:43	06/10/15 12:44	4
Selenium	**0.17**	**J**	0.85	0.13	mg/Kg		06/09/15 18:43	06/10/15 22:04	1
Silver	**0.053**	**J**	0.21	0.043	mg/Kg		06/09/15 18:43	06/10/15 22:04	1
Thallium	**0.16**	**J**	0.42	0.12	mg/Kg		06/09/15 18:43	06/10/15 22:04	1
Vanadium	**20**		1.7	0.23	mg/Kg		06/09/15 18:43	06/10/15 12:44	4
Zinc	**34**		5.1	2.2	mg/Kg		06/09/15 18:43	06/10/15 12:44	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**14**		0.88	0.22	mg/Kg		06/10/15 19:24	06/12/15 21:41	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.96**		0.100	0.100	SU			06/09/15 17:10	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-27

Date Collected: 06/03/15 11:45
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-17

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.34	0.057	mg/Kg		06/09/15 18:43	06/10/15 22:08	1
Arsenic	**5.9**		2.7	0.23	mg/Kg		06/09/15 18:43	06/10/15 12:58	4
Barium	**87**		1.4	0.19	mg/Kg		06/09/15 18:43	06/10/15 12:58	4
Beryllium	ND		0.068	0.022	mg/Kg		06/09/15 18:43	06/10/15 22:08	1
Cadmium	**0.13**		0.086	0.0085	mg/Kg		06/09/15 18:43	06/10/15 22:08	1
Chromium	**8.6**		1.4	0.15	mg/Kg		06/09/15 18:43	06/10/15 12:58	4
Cobalt	**6.1**		0.55	0.055	mg/Kg		06/09/15 18:43	06/10/15 12:58	4
Copper	**9.4**		4.1	2.0	mg/Kg		06/09/15 18:43	06/10/15 12:58	4
Lead	**7.1**		1.4	0.29	mg/Kg		06/09/15 18:43	06/10/15 12:58	4
Molybdenum	**0.33**	**J**	0.34	0.044	mg/Kg		06/09/15 18:43	06/10/15 22:08	1
Nickel	**21**		1.4	0.14	mg/Kg		06/09/15 18:43	06/10/15 12:58	4
Selenium	ND		0.68	0.10	mg/Kg		06/09/15 18:43	06/10/15 22:08	1
Silver	**0.12**	**J**	0.17	0.035	mg/Kg		06/09/15 18:43	06/10/15 22:08	1
Thallium	**0.28**	**J**	0.34	0.099	mg/Kg		06/09/15 18:43	06/10/15 22:08	1
Vanadium	**28**		1.4	0.19	mg/Kg		06/09/15 18:43	06/10/15 12:58	4
Zinc	**37**		4.1	1.7	mg/Kg		06/09/15 18:43	06/10/15 12:58	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.61**		0.045	0.011	mg/Kg		06/10/15 19:24	06/12/15 22:15	5

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.17**		0.100	0.100	SU			06/09/15 17:12	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-28

Date Collected: 06/03/15 12:05
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-18

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	5.6		1.6	0.26	mg/Kg		06/09/15 18:43	06/10/15 13:03	4
Arsenic	25		3.1	0.27	mg/Kg		06/09/15 18:43	06/10/15 13:03	4
Barium	450		1.6	0.22	mg/Kg		06/09/15 18:43	06/10/15 13:03	4
Beryllium	0.039	J	0.079	0.026	mg/Kg		06/09/15 18:43	06/10/15 22:13	1
Cadmium	0.69		0.39	0.039	mg/Kg		06/09/15 18:43	06/10/15 13:03	4
Chromium	6.2		1.6	0.17	mg/Kg		06/09/15 18:43	06/10/15 13:03	4
Cobalt	5.2		0.63	0.063	mg/Kg		06/09/15 18:43	06/10/15 13:03	4
Copper	36		4.7	2.2	mg/Kg		06/09/15 18:43	06/10/15 13:03	4
Lead	97		1.6	0.33	mg/Kg		06/09/15 18:43	06/10/15 13:03	4
Molybdenum	2.0		1.6	0.20	mg/Kg		06/09/15 18:43	06/10/15 13:03	4
Nickel	13		1.6	0.16	mg/Kg		06/09/15 18:43	06/10/15 13:03	4
Selenium	1.5		0.79	0.12	mg/Kg		06/09/15 18:43	06/10/15 22:13	1
Silver	12		0.79	0.16	mg/Kg		06/09/15 18:43	06/10/15 13:03	4
Thallium	0.17	J	0.39	0.11	mg/Kg		06/09/15 18:43	06/10/15 22:13	1
Vanadium	19		1.6	0.21	mg/Kg		06/09/15 18:43	06/10/15 13:03	4
Zinc	74		4.7	2.0	mg/Kg		06/09/15 18:43	06/10/15 13:03	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	42		0.92	0.23	mg/Kg		06/10/15 19:24	06/12/15 21:46	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.69		0.100	0.100	SU			06/09/15 17:14	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-29

Date Collected: 06/03/15 12:15
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-19

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.31	J	0.46	0.077	mg/Kg		06/09/15 18:43	06/11/15 12:44	1
Arsenic	4.6		3.7	0.31	mg/Kg		06/09/15 18:43	06/10/15 13:07	4
Barium	99		1.9	0.26	mg/Kg		06/09/15 18:43	06/10/15 13:07	4
Beryllium	0.18		0.093	0.030	mg/Kg		06/09/15 18:43	06/11/15 12:44	1
Cadmium	0.17		0.12	0.011	mg/Kg		06/09/15 18:43	06/11/15 12:44	1
Chromium	6.7		1.9	0.20	mg/Kg		06/09/15 18:43	06/10/15 13:07	4
Cobalt	4.8		0.74	0.074	mg/Kg		06/09/15 18:43	06/10/15 13:07	4
Copper	8.3		5.6	2.6	mg/Kg		06/09/15 18:43	06/10/15 13:07	4
Lead	11		1.9	0.39	mg/Kg		06/09/15 18:43	06/10/15 13:07	4
Molybdenum	0.52		0.46	0.059	mg/Kg		06/09/15 18:43	06/11/15 12:44	1
Nickel	14		1.9	0.19	mg/Kg		06/09/15 18:43	06/10/15 13:07	4
Selenium	ND		0.93	0.14	mg/Kg		06/09/15 18:43	06/11/15 12:44	1
Silver	0.36		0.23	0.047	mg/Kg		06/09/15 18:43	06/11/15 12:44	1
Thallium	ND		0.46	0.13	mg/Kg		06/09/15 18:43	06/11/15 12:44	1
Vanadium	21		1.9	0.25	mg/Kg		06/09/15 18:43	06/10/15 13:07	4
Zinc	33		5.6	2.4	mg/Kg		06/09/15 18:43	06/10/15 13:07	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	2.1	B F1 F2	0.94	0.23	mg/Kg		06/10/15 19:56	06/15/15 16:29	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.91		0.100	0.100	SU			06/09/15 17:15	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-30

Date Collected: 06/03/15 12:20
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-20

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	5.4		1.7	0.27	mg/Kg		06/09/15 18:43	06/10/15 13:12	4
Arsenic	39		3.3	0.28	mg/Kg		06/09/15 18:43	06/10/15 13:12	4
Barium	520		1.7	0.23	mg/Kg		06/09/15 18:43	06/10/15 13:12	4
Beryllium	ND		0.083	0.027	mg/Kg		06/09/15 18:43	06/10/15 22:23	1
Cadmium	1.1		0.41	0.041	mg/Kg		06/09/15 18:43	06/10/15 13:12	4
Chromium	5.3		1.7	0.18	mg/Kg		06/09/15 18:43	06/10/15 13:12	4
Cobalt	3.9		0.66	0.066	mg/Kg		06/09/15 18:43	06/10/15 13:12	4
Copper	45		5.0	2.4	mg/Kg		06/09/15 18:43	06/10/15 13:12	4
Lead	110		1.7	0.35	mg/Kg		06/09/15 18:43	06/10/15 13:12	4
Molybdenum	1.8		1.7	0.21	mg/Kg		06/09/15 18:43	06/10/15 13:12	4
Nickel	12		1.7	0.17	mg/Kg		06/09/15 18:43	06/10/15 13:12	4
Selenium	2.4		0.83	0.12	mg/Kg		06/09/15 18:43	06/10/15 22:23	1
Silver	19		0.83	0.17	mg/Kg		06/09/15 18:43	06/10/15 13:12	4
Thallium	0.23	J	0.41	0.12	mg/Kg		06/09/15 18:43	06/10/15 22:23	1
Vanadium	17		1.7	0.22	mg/Kg		06/09/15 18:43	06/10/15 13:12	4
Zinc	110		5.0	2.1	mg/Kg		06/09/15 18:43	06/10/15 13:12	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	120	B	0.98	0.25	mg/Kg		06/10/15 19:56	06/15/15 16:31	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.49		0.100	0.100	SU			06/09/15 17:19	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-31

Date Collected: 06/03/15 12:30
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-21

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.43	0.071	mg/Kg		06/09/15 18:43	06/10/15 22:27	1
Arsenic	**3.1**		0.85	0.073	mg/Kg		06/09/15 18:43	06/10/15 22:27	1
Barium	**73**		1.7	0.24	mg/Kg		06/09/15 18:43	06/10/15 13:17	4
Beryllium	ND		0.085	0.028	mg/Kg		06/09/15 18:43	06/10/15 22:27	1
Cadmium	**0.085**	**J**	0.11	0.011	mg/Kg		06/09/15 18:43	06/10/15 22:27	1
Chromium	**6.1**		1.7	0.18	mg/Kg		06/09/15 18:43	06/10/15 13:17	4
Cobalt	**4.6**		0.68	0.068	mg/Kg		06/09/15 18:43	06/10/15 13:17	4
Copper	**5.1**		5.1	2.4	mg/Kg		06/09/15 18:43	06/10/15 13:17	4
Lead	**4.1**		1.7	0.36	mg/Kg		06/09/15 18:43	06/10/15 13:17	4
Molybdenum	**0.39**	**J**	0.43	0.055	mg/Kg		06/09/15 18:43	06/10/15 22:27	1
Nickel	**13**		1.7	0.17	mg/Kg		06/09/15 18:43	06/10/15 13:17	4
Selenium	ND		0.85	0.13	mg/Kg		06/09/15 18:43	06/10/15 22:27	1
Silver	ND		0.21	0.043	mg/Kg		06/09/15 18:43	06/10/15 22:27	1
Thallium	**0.25**	**J**	0.43	0.12	mg/Kg		06/09/15 18:43	06/10/15 22:27	1
Vanadium	**21**		1.7	0.23	mg/Kg		06/09/15 18:43	06/10/15 13:17	4
Zinc	**37**		5.1	2.2	mg/Kg		06/09/15 18:43	06/10/15 13:17	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.88**	**J B**	0.90	0.22	mg/Kg		06/10/15 19:56	06/15/15 16:33	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.64**		0.100	0.100	SU			06/09/15 21:41	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-32

Date Collected: 06/03/15 12:35
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-22

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	4.2		1.3	0.22	mg/Kg		06/09/15 18:43	06/10/15 13:21	4
Arsenic	10		2.7	0.23	mg/Kg		06/09/15 18:43	06/10/15 13:21	4
Barium	390		1.3	0.19	mg/Kg		06/09/15 18:43	06/10/15 13:21	4
Beryllium	ND		0.067	0.022	mg/Kg		06/09/15 18:43	06/10/15 22:32	1
Cadmium	0.39		0.33	0.033	mg/Kg		06/09/15 18:43	06/10/15 13:21	4
Chromium	6.4		1.3	0.14	mg/Kg		06/09/15 18:43	06/10/15 13:21	4
Cobalt	3.9		0.53	0.053	mg/Kg		06/09/15 18:43	06/10/15 13:21	4
Copper	21		4.0	1.9	mg/Kg		06/09/15 18:43	06/10/15 13:21	4
Lead	50		1.3	0.28	mg/Kg		06/09/15 18:43	06/10/15 13:21	4
Molybdenum	0.73		0.33	0.043	mg/Kg		06/09/15 18:43	06/10/15 22:32	1
Nickel	14		1.3	0.14	mg/Kg		06/09/15 18:43	06/10/15 13:21	4
Selenium	0.59	J	0.67	0.10	mg/Kg		06/09/15 18:43	06/10/15 22:32	1
Silver	6.3		0.67	0.13	mg/Kg		06/09/15 18:43	06/10/15 13:21	4
Thallium	0.18	J	0.33	0.097	mg/Kg		06/09/15 18:43	06/10/15 22:32	1
Vanadium	15		1.3	0.18	mg/Kg		06/09/15 18:43	06/10/15 13:21	4
Zinc	64		4.0	1.7	mg/Kg		06/09/15 18:43	06/10/15 13:21	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	140	B	0.87	0.22	mg/Kg		06/10/15 19:56	06/15/15 16:36	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.20		0.100	0.100	SU			06/09/15 21:47	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-33

Date Collected: 06/03/15 12:40
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-23

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	1.3		0.43	0.072	mg/Kg		06/09/15 19:21	06/10/15 20:33	1
Arsenic	8.4		3.4	0.29	mg/Kg		06/09/15 19:21	06/10/15 13:00	4
Barium	200		1.7	0.24	mg/Kg		06/09/15 19:21	06/10/15 13:00	4
Beryllium	0.28		0.086	0.028	mg/Kg		06/09/15 19:21	06/10/15 20:33	1
Cadmium	0.27		0.11	0.011	mg/Kg		06/09/15 19:21	06/10/15 20:33	1
Chromium	7.1	B	1.7	0.18	mg/Kg		06/09/15 19:21	06/10/15 13:00	4
Cobalt	5.0		0.69	0.069	mg/Kg		06/09/15 19:21	06/10/15 13:00	4
Copper	15		5.2	2.5	mg/Kg		06/09/15 19:21	06/10/15 13:00	4
Lead	49		1.7	0.36	mg/Kg		06/09/15 19:21	06/10/15 13:00	4
Molybdenum	1.8		1.7	0.22	mg/Kg		06/09/15 19:21	06/10/15 13:00	4
Nickel	12		1.7	0.18	mg/Kg		06/09/15 19:21	06/10/15 13:00	4
Selenium	0.21	J	0.86	0.13	mg/Kg		06/09/15 19:21	06/10/15 20:33	1
Silver	3.0		0.86	0.17	mg/Kg		06/09/15 19:21	06/10/15 13:00	4
Thallium	ND		0.43	0.13	mg/Kg		06/09/15 19:21	06/10/15 20:33	1
Vanadium	18		1.7	0.23	mg/Kg		06/09/15 19:21	06/10/15 13:00	4
Zinc	63		5.2	2.2	mg/Kg		06/09/15 19:21	06/10/15 13:00	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	14	B	0.90	0.22	mg/Kg		06/10/15 19:56	06/15/15 16:40	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.81		0.100	0.100	SU			06/09/15 21:48	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-34

Date Collected: 06/03/15 12:55
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-24

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.67		0.33	0.054	mg/Kg		06/09/15 19:21	06/10/15 20:38	1
Arsenic	6.8		2.6	0.22	mg/Kg		06/09/15 19:21	06/10/15 13:05	4
Barium	94		1.3	0.19	mg/Kg		06/09/15 19:21	06/10/15 13:05	4
Beryllium	0.33		0.26	0.085	mg/Kg		06/09/15 19:21	06/10/15 13:05	4
Cadmium	0.12		0.082	0.0081	mg/Kg		06/09/15 19:21	06/10/15 20:38	1
Chromium	9.1	B	1.3	0.14	mg/Kg		06/09/15 19:21	06/10/15 13:05	4
Cobalt	6.9		0.52	0.052	mg/Kg		06/09/15 19:21	06/10/15 13:05	4
Copper	8.8		3.9	1.9	mg/Kg		06/09/15 19:21	06/10/15 13:05	4
Lead	8.7		1.3	0.27	mg/Kg		06/09/15 19:21	06/10/15 13:05	4
Molybdenum	0.79		0.33	0.042	mg/Kg		06/09/15 19:21	06/10/15 20:38	1
Nickel	19		1.3	0.13	mg/Kg		06/09/15 19:21	06/10/15 13:05	4
Selenium	ND		0.65	0.098	mg/Kg		06/09/15 19:21	06/10/15 20:38	1
Silver	0.68		0.65	0.13	mg/Kg		06/09/15 19:21	06/10/15 13:05	4
Thallium	ND		0.33	0.095	mg/Kg		06/09/15 19:21	06/10/15 20:38	1
Vanadium	24		1.3	0.18	mg/Kg		06/09/15 19:21	06/10/15 13:05	4
Zinc	40		3.9	1.7	mg/Kg		06/09/15 19:21	06/10/15 13:05	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	4.0	B	0.85	0.21	mg/Kg		06/10/15 19:56	06/15/15 16:47	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.84		0.100	0.100	SU			06/09/15 21:51	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-35

Date Collected: 06/03/15 13:05
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-25

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	6.6		2.0	0.33	mg/Kg		06/09/15 19:21	06/10/15 13:21	4
Arsenic	24		3.9	0.33	mg/Kg		06/09/15 19:21	06/10/15 13:21	4
Barium	630		2.0	0.28	mg/Kg		06/09/15 19:21	06/10/15 13:21	4
Beryllium	0.19		0.098	0.032	mg/Kg		06/09/15 19:21	06/10/15 20:43	1
Cadmium	0.78		0.49	0.049	mg/Kg		06/09/15 19:21	06/10/15 13:21	4
Chromium	6.5	B	2.0	0.21	mg/Kg		06/09/15 19:21	06/10/15 13:21	4
Cobalt	3.9		0.78	0.078	mg/Kg		06/09/15 19:21	06/10/15 13:21	4
Copper	33		5.9	2.8	mg/Kg		06/09/15 19:21	06/10/15 13:21	4
Lead	98		2.0	0.41	mg/Kg		06/09/15 19:21	06/10/15 13:21	4
Molybdenum	2.1		2.0	0.25	mg/Kg		06/09/15 19:21	06/10/15 13:21	4
Nickel	13		2.0	0.20	mg/Kg		06/09/15 19:21	06/10/15 13:21	4
Selenium	1.3		0.98	0.15	mg/Kg		06/09/15 19:21	06/10/15 20:43	1
Silver	9.8		0.98	0.20	mg/Kg		06/09/15 19:21	06/10/15 13:21	4
Thallium	ND		0.49	0.14	mg/Kg		06/09/15 19:21	06/10/15 20:43	1
Vanadium	20		2.0	0.27	mg/Kg		06/09/15 19:21	06/10/15 13:21	4
Zinc	79		5.9	2.5	mg/Kg		06/09/15 19:21	06/10/15 13:21	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	72	B	0.90	0.22	mg/Kg		06/10/15 19:56	06/15/15 16:50	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.94		0.100	0.100	SU			06/09/15 21:52	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-36

Lab Sample ID: 720-65322-26

Date Collected: 06/03/15 13:10
Matrix: Solid
Date Received: 06/08/15 15:30

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.57		0.38	0.064	mg/Kg		06/09/15 19:21	06/10/15 20:48	1
Arsenic	4.3		3.1	0.26	mg/Kg		06/09/15 19:21	06/10/15 13:25	4
Barium	85		1.5	0.22	mg/Kg		06/09/15 19:21	06/10/15 13:25	4
Beryllium	0.15		0.077	0.025	mg/Kg		06/09/15 19:21	06/10/15 20:48	1
Cadmium	0.15		0.096	0.0095	mg/Kg		06/09/15 19:21	06/10/15 20:48	1
Chromium	6.8	B	1.5	0.16	mg/Kg		06/09/15 19:21	06/10/15 13:25	4
Cobalt	3.7		0.62	0.062	mg/Kg		06/09/15 19:21	06/10/15 13:25	4
Copper	8.5		4.6	2.2	mg/Kg		06/09/15 19:21	06/10/15 13:25	4
Lead	12		1.5	0.32	mg/Kg		06/09/15 19:21	06/10/15 13:25	4
Molybdenum	0.45		0.38	0.049	mg/Kg		06/09/15 19:21	06/10/15 20:48	1
Nickel	10		1.5	0.16	mg/Kg		06/09/15 19:21	06/10/15 13:25	4
Selenium	ND		0.77	0.12	mg/Kg		06/09/15 19:21	06/10/15 20:48	1
Silver	0.30		0.19	0.039	mg/Kg		06/09/15 19:21	06/10/15 20:48	1
Thallium	ND		0.38	0.11	mg/Kg		06/09/15 19:21	06/10/15 20:48	1
Vanadium	17		1.5	0.21	mg/Kg		06/09/15 19:21	06/10/15 13:25	4
Zinc	40		4.6	2.0	mg/Kg		06/09/15 19:21	06/10/15 13:25	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.62	B	0.0091	0.0023	mg/Kg		06/10/15 19:56	06/15/15 17:31	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.42		0.100	0.100	SU			06/09/15 21:55	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-37

Date Collected: 06/03/15 13:20
Date Received: 06/08/15 15:30

Lab Sample ID: 720-65322-27

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.98		0.49	0.081	mg/Kg		06/09/15 19:21	06/10/15 20:53	1
Arsenic	6.4		3.9	0.33	mg/Kg		06/09/15 19:21	06/10/15 13:30	4
Barium	91		1.9	0.28	mg/Kg		06/09/15 19:21	06/10/15 13:30	4
Beryllium	0.13		0.097	0.032	mg/Kg		06/09/15 19:21	06/10/15 20:53	1
Cadmium	0.15		0.12	0.012	mg/Kg		06/09/15 19:21	06/10/15 20:53	1
Chromium	5.4	B	1.9	0.21	mg/Kg		06/09/15 19:21	06/10/15 13:30	4
Cobalt	4.1		0.78	0.078	mg/Kg		06/09/15 19:21	06/10/15 13:30	4
Copper	17		5.8	2.8	mg/Kg		06/09/15 19:21	06/10/15 13:30	4
Lead	240		1.9	0.41	mg/Kg		06/09/15 19:21	06/10/15 13:30	4
Molybdenum	0.42	J	0.49	0.062	mg/Kg		06/09/15 19:21	06/10/15 20:53	1
Nickel	7.8		1.9	0.20	mg/Kg		06/09/15 19:21	06/10/15 13:30	4
Selenium	ND		0.97	0.15	mg/Kg		06/09/15 19:21	06/10/15 20:53	1
Silver	1.5		0.97	0.20	mg/Kg		06/09/15 19:21	06/10/15 13:30	4
Thallium	ND		0.49	0.14	mg/Kg		06/09/15 19:21	06/10/15 20:53	1
Vanadium	13		1.9	0.26	mg/Kg		06/09/15 19:21	06/10/15 13:30	4
Zinc	63		5.8	2.5	mg/Kg		06/09/15 19:21	06/10/15 13:30	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	2.0	B	0.88	0.22	mg/Kg		06/10/15 19:56	06/15/15 16:54	100

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.36		0.100	0.100	SU			06/09/15 21:57	1

QC Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 720-183308/1-A
Matrix: Solid
Analysis Batch: 183414

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 183308

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.215	J	0.50	0.083	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Arsenic	ND		1.0	0.085	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Barium	ND		0.50	0.071	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Beryllium	ND		0.10	0.033	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Cadmium	ND		0.13	0.012	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Chromium	ND		0.50	0.053	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Cobalt	ND		0.20	0.020	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Copper	ND		1.5	0.71	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Lead	ND		0.50	0.11	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Molybdenum	ND		0.50	0.064	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Nickel	ND		0.50	0.051	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Selenium	ND		1.0	0.15	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Silver	ND		0.25	0.051	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Thallium	ND		0.50	0.15	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Vanadium	ND		0.50	0.068	mg/Kg		06/09/15 17:56	06/10/15 22:51	1
Zinc	ND		1.5	0.64	mg/Kg		06/09/15 17:56	06/10/15 22:51	1

Lab Sample ID: LCS 720-183308/2-A
Matrix: Solid
Analysis Batch: 183414

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 183308

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	50.0	47.3		mg/Kg		95	80 - 120
Arsenic	50.0	47.6		mg/Kg		95	80 - 120
Barium	50.0	47.4		mg/Kg		95	80 - 120
Beryllium	50.0	48.4		mg/Kg		97	80 - 120
Cadmium	50.0	48.3		mg/Kg		97	80 - 120
Chromium	50.0	49.3		mg/Kg		99	80 - 120
Cobalt	50.0	50.6		mg/Kg		101	80 - 120
Copper	50.0	49.5		mg/Kg		99	80 - 120
Lead	50.0	49.6		mg/Kg		99	80 - 120
Molybdenum	50.0	50.0		mg/Kg		100	80 - 120
Nickel	50.0	49.5		mg/Kg		99	80 - 120
Selenium	50.0	47.3		mg/Kg		95	80 - 120
Silver	25.0	23.8		mg/Kg		95	80 - 120
Thallium	50.0	49.6		mg/Kg		99	80 - 120
Vanadium	50.0	48.0		mg/Kg		96	80 - 120
Zinc	50.0	48.0		mg/Kg		96	80 - 120

Lab Sample ID: LCSD 720-183308/3-A
Matrix: Solid
Analysis Batch: 183414

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 183308

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	50.0	48.1		mg/Kg		96	80 - 120	2	20
Arsenic	50.0	48.4		mg/Kg		97	80 - 120	2	20
Barium	50.0	47.7		mg/Kg		95	80 - 120	1	20
Beryllium	50.0	48.8		mg/Kg		98	80 - 120	1	20

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCSD 720-183308/3-A
Matrix: Solid
Analysis Batch: 183414

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 183308

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cadmium	50.0	48.8		mg/Kg		98	80 - 120	1	20
Chromium	50.0	49.8		mg/Kg		100	80 - 120	1	20
Cobalt	50.0	51.5		mg/Kg		103	80 - 120	2	20
Copper	50.0	49.9		mg/Kg		100	80 - 120	1	20
Lead	50.0	50.3		mg/Kg		101	80 - 120	1	20
Molybdenum	50.0	50.8		mg/Kg		102	80 - 120	2	20
Nickel	50.0	50.2		mg/Kg		100	80 - 120	1	20
Selenium	50.0	48.1		mg/Kg		96	80 - 120	2	20
Silver	25.0	24.1		mg/Kg		97	80 - 120	1	20
Thallium	50.0	50.2		mg/Kg		100	80 - 120	1	20
Vanadium	50.0	48.2		mg/Kg		96	80 - 120	0	20
Zinc	50.0	48.6		mg/Kg		97	80 - 120	1	20

Lab Sample ID: LCSSRM 720-183308/19-A
Matrix: Solid
Analysis Batch: 183414

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 183308

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	74.6	45.1		mg/Kg		60	11 - 101
Arsenic	45.5	45.0		mg/Kg		99	69 - 119
Barium	579	600		mg/Kg		104	61 - 117
Cadmium	201	191		mg/Kg		95	67 - 118
Chromium	106	104		mg/Kg		98	67 - 121
Cobalt	247	249		mg/Kg		101	64 - 133
Copper	130	130		mg/Kg		100	68 - 126
Lead	302	281		mg/Kg		93	62 - 113
Molybdenum	165	162		mg/Kg		98	62 - 128
Nickel	305	298		mg/Kg		98	65 - 117
Selenium	133	135		mg/Kg		101	63 - 126
Silver	33.5	32.1		mg/Kg		96	51 - 130
Thallium	191	177		mg/Kg		93	64 - 124
Vanadium	214	210		mg/Kg		98	67 - 123
Zinc	388	372		mg/Kg		96	62 - 110

Lab Sample ID: LCSSRM 720-183308/19-A
Matrix: Solid
Analysis Batch: 183444

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 183308

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	155	141		mg/Kg		91	56 - 102

Lab Sample ID: MB 720-183309/1-A
Matrix: Solid
Analysis Batch: 183369

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 183309

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.50	0.083	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Arsenic	ND		1.0	0.085	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Barium	ND		0.50	0.071	mg/Kg		06/09/15 18:43	06/10/15 11:07	1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: MB 720-183309/1-A
Matrix: Solid
Analysis Batch: 183369

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 183309

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.10	0.033	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Cadmium	ND		0.13	0.012	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Chromium	ND		0.50	0.053	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Cobalt	ND		0.20	0.020	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Copper	ND		1.5	0.71	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Lead	ND		0.50	0.11	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Molybdenum	ND		0.50	0.064	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Nickel	ND		0.50	0.051	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Selenium	ND		1.0	0.15	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Silver	ND		0.25	0.051	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Thallium	ND		0.50	0.15	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Vanadium	ND		0.50	0.068	mg/Kg		06/09/15 18:43	06/10/15 11:07	1
Zinc	ND		1.5	0.64	mg/Kg		06/09/15 18:43	06/10/15 11:07	1

Lab Sample ID: LCS 720-183309/2-A
Matrix: Solid
Analysis Batch: 183369

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 183309

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	50.0	48.1		mg/Kg		96	80 - 120
Arsenic	50.0	48.3		mg/Kg		97	80 - 120
Barium	50.0	49.4		mg/Kg		99	80 - 120
Beryllium	50.0	49.2		mg/Kg		98	80 - 120
Cadmium	50.0	48.8		mg/Kg		98	80 - 120
Chromium	50.0	49.8		mg/Kg		100	80 - 120
Cobalt	50.0	49.4		mg/Kg		99	80 - 120
Copper	50.0	49.6		mg/Kg		99	80 - 120
Lead	50.0	49.3		mg/Kg		99	80 - 120
Molybdenum	50.0	49.7		mg/Kg		99	80 - 120
Nickel	50.0	49.3		mg/Kg		99	80 - 120
Selenium	50.0	46.8		mg/Kg		94	80 - 120
Silver	25.0	24.4		mg/Kg		98	80 - 120
Thallium	50.0	49.6		mg/Kg		99	80 - 120
Vanadium	50.0	48.9		mg/Kg		98	80 - 120
Zinc	50.0	48.7		mg/Kg		97	80 - 120

Lab Sample ID: LCSD 720-183309/3-A
Matrix: Solid
Analysis Batch: 183369

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 183309

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	50.0	49.4		mg/Kg		99	80 - 120	3	20
Arsenic	50.0	49.7		mg/Kg		99	80 - 120	3	20
Barium	50.0	47.0		mg/Kg		94	80 - 120	5	20
Beryllium	50.0	46.7		mg/Kg		93	80 - 120	5	20
Cadmium	50.0	49.7		mg/Kg		99	80 - 120	2	20
Chromium	50.0	50.6		mg/Kg		101	80 - 120	2	20
Cobalt	50.0	50.4		mg/Kg		101	80 - 120	2	20
Copper	50.0	50.4		mg/Kg		101	80 - 120	2	20

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCSD 720-183309/3-A
Matrix: Solid
Analysis Batch: 183369

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 183309

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Lead	50.0	50.4		mg/Kg		101	80 - 120	2	20
Molybdenum	50.0	51.1		mg/Kg		102	80 - 120	3	20
Nickel	50.0	50.3		mg/Kg		101	80 - 120	2	20
Selenium	50.0	48.1		mg/Kg		96	80 - 120	3	20
Silver	25.0	25.0		mg/Kg		100	80 - 120	2	20
Thallium	50.0	50.8		mg/Kg		102	80 - 120	2	20
Vanadium	50.0	49.8		mg/Kg		100	80 - 120	2	20
Zinc	50.0	49.7		mg/Kg		99	80 - 120	2	20

Lab Sample ID: LCSSRM 720-183309/25-A
Matrix: Solid
Analysis Batch: 183369

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 183309

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	74.6	58.4		mg/Kg		78	11 - 101
Arsenic	45.5	43.6		mg/Kg		96	69 - 119
Barium	579	567		mg/Kg		98	61 - 117
Beryllium	155	155		mg/Kg		100	56 - 102
Cadmium	201	183		mg/Kg		91	67 - 118
Chromium	106	99.5		mg/Kg		94	67 - 121
Cobalt	247	227		mg/Kg		92	64 - 133
Copper	130	123		mg/Kg		95	68 - 126
Lead	302	268		mg/Kg		89	62 - 113
Molybdenum	165	153		mg/Kg		93	62 - 128
Nickel	305	279		mg/Kg		91	65 - 117
Selenium	133	125		mg/Kg		94	63 - 126
Silver	33.5	31.6		mg/Kg		94	51 - 130
Thallium	191	170		mg/Kg		89	64 - 124
Vanadium	214	204		mg/Kg		95	67 - 123
Zinc	388	349		mg/Kg		90	62 - 110

Lab Sample ID: 720-65322-4 MS
Matrix: Solid
Analysis Batch: 183369

Client Sample ID: MM-SD-07
Prep Type: Total/NA
Prep Batch: 183309

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	6.2	F1	43.9	32.6	F1	mg/Kg		60	75 - 125
Arsenic	17		43.9	54.5		mg/Kg		85	75 - 125
Barium	400		43.9	405	4	mg/Kg		7	75 - 125
Beryllium	0.19	J	43.9	41.9		mg/Kg		95	75 - 125
Cadmium	1.4		43.9	41.9		mg/Kg		93	75 - 125
Chromium	6.4		43.9	47.4		mg/Kg		93	75 - 125
Cobalt	4.7		43.9	45.5		mg/Kg		93	75 - 125
Copper	85		43.9	133		mg/Kg		109	75 - 125
Lead	360		43.9	382	4	mg/Kg		55	75 - 125
Molybdenum	1.8		43.9	44.2		mg/Kg		97	75 - 125
Nickel	12		43.9	53.1		mg/Kg		93	75 - 125
Selenium	2.2	J	43.9	43.7		mg/Kg		95	75 - 125
Silver	17		21.9	35.0		mg/Kg		83	75 - 125

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: 720-65322-4 MS — **Client Sample ID: MM-SD-07**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183369 — **Prep Batch: 183309**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Thallium	ND		43.9	41.2		mg/Kg		94	75 - 125
Vanadium	17		43.9	54.8		mg/Kg		87	75 - 125
Zinc	100		43.9	136		mg/Kg		83	75 - 125

Lab Sample ID: 720-65322-4 MSD — **Client Sample ID: MM-SD-07**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183369 — **Prep Batch: 183309**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	6.2	F1	39.7	28.6	F1	mg/Kg		56	75 - 125	13	20
Arsenic	17		39.7	52.6		mg/Kg		89	75 - 125	4	20
Barium	400		39.7	427	4	mg/Kg		61	75 - 125	5	20
Beryllium	0.19	J	39.7	37.8		mg/Kg		95	75 - 125	11	20
Cadmium	1.4		39.7	37.5		mg/Kg		91	75 - 125	11	20
Chromium	6.4		39.7	43.0		mg/Kg		92	75 - 125	10	20
Cobalt	4.7		39.7	41.0		mg/Kg		91	75 - 125	10	20
Copper	85		39.7	122		mg/Kg		93	75 - 125	9	20
Lead	360		39.7	365	4	mg/Kg		19	75 - 125	4	20
Molybdenum	1.8		39.7	38.2		mg/Kg		92	75 - 125	15	20
Nickel	12		39.7	49.2		mg/Kg		93	75 - 125	8	20
Selenium	2.2	J	39.7	37.9		mg/Kg		90	75 - 125	14	20
Silver	17		19.8	35.4		mg/Kg		94	75 - 125	1	20
Thallium	ND		39.7	36.5		mg/Kg		92	75 - 125	12	20
Vanadium	17		39.7	52.2		mg/Kg		89	75 - 125	5	20
Zinc	100		39.7	138		mg/Kg		97	75 - 125	2	20

Lab Sample ID: MB 720-183314/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183372 — **Prep Batch: 183314**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.50	0.083	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Arsenic	ND		1.0	0.085	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Barium	ND		0.50	0.071	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Beryllium	ND		0.10	0.033	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Cadmium	ND		0.13	0.012	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Chromium	0.0718	J	0.50	0.053	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Cobalt	ND		0.20	0.020	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Copper	ND		1.5	0.71	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Lead	ND		0.50	0.11	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Molybdenum	ND		0.50	0.064	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Nickel	ND		0.50	0.051	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Selenium	ND		1.0	0.15	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Silver	ND		0.25	0.051	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Thallium	ND		0.50	0.15	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Vanadium	ND		0.50	0.068	mg/Kg		06/09/15 19:21	06/10/15 12:20	1
Zinc	ND		1.5	0.64	mg/Kg		06/09/15 19:21	06/10/15 12:20	1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCS 720-183314/2-A
Matrix: Solid
Analysis Batch: 183372

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 183314

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	50.0	46.9		mg/Kg		94	80 - 120
Arsenic	50.0	48.3		mg/Kg		97	80 - 120
Barium	50.0	48.7		mg/Kg		97	80 - 120
Beryllium	50.0	50.6		mg/Kg		101	80 - 120
Cadmium	50.0	50.3		mg/Kg		101	80 - 120
Chromium	50.0	51.0		mg/Kg		102	80 - 120
Cobalt	50.0	52.6		mg/Kg		105	80 - 120
Copper	50.0	50.1		mg/Kg		100	80 - 120
Lead	50.0	49.6		mg/Kg		99	80 - 120
Molybdenum	50.0	50.7		mg/Kg		101	80 - 120
Nickel	50.0	50.8		mg/Kg		102	80 - 120
Selenium	50.0	47.2		mg/Kg		94	80 - 120
Silver	25.0	23.3		mg/Kg		93	80 - 120
Thallium	50.0	49.9		mg/Kg		100	80 - 120
Vanadium	50.0	48.8		mg/Kg		98	80 - 120
Zinc	50.0	51.3		mg/Kg		103	80 - 120

Lab Sample ID: LCSD 720-183314/3-A
Matrix: Solid
Analysis Batch: 183372

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 183314

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	50.0	46.1		mg/Kg		92	80 - 120	2	20
Arsenic	50.0	47.4		mg/Kg		95	80 - 120	2	20
Barium	50.0	47.8		mg/Kg		96	80 - 120	2	20
Beryllium	50.0	49.5		mg/Kg		99	80 - 120	2	20
Cadmium	50.0	49.5		mg/Kg		99	80 - 120	2	20
Chromium	50.0	50.0		mg/Kg		100	80 - 120	2	20
Cobalt	50.0	51.7		mg/Kg		103	80 - 120	2	20
Copper	50.0	49.1		mg/Kg		98	80 - 120	2	20
Lead	50.0	48.8		mg/Kg		98	80 - 120	2	20
Molybdenum	50.0	49.8		mg/Kg		100	80 - 120	2	20
Nickel	50.0	49.8		mg/Kg		100	80 - 120	2	20
Selenium	50.0	46.0		mg/Kg		92	80 - 120	3	20
Silver	25.0	22.8		mg/Kg		91	80 - 120	2	20
Thallium	50.0	49.0		mg/Kg		98	80 - 120	2	20
Vanadium	50.0	47.9		mg/Kg		96	80 - 120	2	20
Zinc	50.0	50.6		mg/Kg		101	80 - 120	1	20

Lab Sample ID: LCSSRM 720-183314/25-A
Matrix: Solid
Analysis Batch: 183372

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 183314

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	74.6	46.9		mg/Kg		63	11 - 101
Arsenic	45.5	43.6		mg/Kg		96	69 - 119
Barium	579	534		mg/Kg		92	61 - 117
Beryllium	155	148		mg/Kg		95	56 - 102

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCSSRM 720-183314/25-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183372 — **Prep Batch: 183314**

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	201	190		mg/Kg		95	67 - 118
Chromium	106	102		mg/Kg		96	67 - 121
Cobalt	247	244		mg/Kg		99	64 - 133
Copper	130	127		mg/Kg		98	68 - 126
Lead	302	275		mg/Kg		91	62 - 113
Molybdenum	165	156		mg/Kg		94	62 - 128
Nickel	305	289		mg/Kg		95	65 - 117
Selenium	133	126		mg/Kg		94	63 - 126
Silver	33.5	30.2		mg/Kg		90	51 - 130
Thallium	191	176		mg/Kg		92	64 - 124
Vanadium	214	202		mg/Kg		94	67 - 123
Zinc	388	374		mg/Kg		96	62 - 110

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 720-183390/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183573 — **Prep Batch: 183390**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.010	0.0025	mg/Kg		06/10/15 19:24	06/12/15 20:23	1

Lab Sample ID: LCS 720-183390/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183573 — **Prep Batch: 183390**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.833	0.950		mg/Kg		114	80 - 120

Lab Sample ID: LCSD 720-183390/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183573 — **Prep Batch: 183390**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.833	0.950		mg/Kg		114	80 - 120	0	20

Lab Sample ID: MB 720-183393/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183648 — **Prep Batch: 183393**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.00600	J	0.010	0.0025	mg/Kg		06/10/15 19:56	06/15/15 16:17	1

Lab Sample ID: LCS 720-183393/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183648 — **Prep Batch: 183393**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.833	0.821		mg/Kg		99	80 - 120

Method: 7471A - Mercury (CVAA) (Continued)

Lab Sample ID: LCSD 720-183393/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183648 — **Prep Batch: 183393**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury			0.833	0.820		mg/Kg		98	80 - 120	0	20

Lab Sample ID: 720-65322-19 MS — **Client Sample ID: MM-S-29**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183648 — **Prep Batch: 183393**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Mercury	2.1	B F1 F2	0.714	2.77		mg/Kg		92	75 - 125		

Lab Sample ID: 720-65322-19 MSD — **Client Sample ID: MM-S-29**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183648 — **Prep Batch: 183393**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	2.1	B F1 F2	0.806	4.49	F1 F2	mg/Kg		294	75 - 125	47	20

Method: 9045C - pH

Lab Sample ID: LCS 720-183298/1 — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183298

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.000		SU		100	99 - 101		

Lab Sample ID: LCS 720-183321/1 — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 183321

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	6.960		SU		99	99 - 101		

Lab Sample ID: 720-65322-1 DU — **Client Sample ID: MM-SD-04**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 183298

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.91			6.920		SU				0.1	20

Lab Sample ID: 720-65322-21 DU — **Client Sample ID: MM-S-31**
Matrix: Solid — **Prep Type: Soluble**
Analysis Batch: 183321

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	5.64			5.720		SU				1	20

Metals

Prep Batch: 183308

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-1	MM-SD-04	Total/NA	Solid	3050B	
720-65322-2	MM-SD-05	Total/NA	Solid	3050B	
720-65322-3	MM-SD-06	Total/NA	Solid	3050B	
LCS 720-183308/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 720-183308/3-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
LCSSRM 720-183308/19-A	Lab Control Sample	Total/NA	Solid	3050B	
MB 720-183308/1-A	Method Blank	Total/NA	Solid	3050B	

Prep Batch: 183309

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-4	MM-SD-07	Total/NA	Solid	3050B	
720-65322-4 MS	MM-SD-07	Total/NA	Solid	3050B	
720-65322-4 MSD	MM-SD-07	Total/NA	Solid	3050B	
720-65322-5	MM-SD-08	Total/NA	Solid	3050B	
720-65322-6	MM-S-16	Total/NA	Solid	3050B	
720-65322-7	MM-S-17	Total/NA	Solid	3050B	
720-65322-8	MM-S-18	Total/NA	Solid	3050B	
720-65322-9	MM-S-19	Total/NA	Solid	3050B	
720-65322-10	MM-S-20	Total/NA	Solid	3050B	
720-65322-11	MM-S-21	Total/NA	Solid	3050B	
720-65322-12	MM-S-22	Total/NA	Solid	3050B	
720-65322-13	MM-S-23	Total/NA	Solid	3050B	
720-65322-14	MM-S-24	Total/NA	Solid	3050B	
720-65322-15	MM-S-25	Total/NA	Solid	3050B	
720-65322-16	MM-S-26	Total/NA	Solid	3050B	
720-65322-17	MM-S-27	Total/NA	Solid	3050B	
720-65322-18	MM-S-28	Total/NA	Solid	3050B	
720-65322-19	MM-S-29	Total/NA	Solid	3050B	
720-65322-20	MM-S-30	Total/NA	Solid	3050B	
720-65322-21	MM-S-31	Total/NA	Solid	3050B	
720-65322-22	MM-S-32	Total/NA	Solid	3050B	
LCS 720-183309/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 720-183309/3-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
LCSSRM 720-183309/25-A	Lab Control Sample	Total/NA	Solid	3050B	
MB 720-183309/1-A	Method Blank	Total/NA	Solid	3050B	

Prep Batch: 183314

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-23	MM-S-33	Total/NA	Solid	3050B	
720-65322-24	MM-S-34	Total/NA	Solid	3050B	
720-65322-25	MM-S-35	Total/NA	Solid	3050B	
720-65322-26	MM-S-36	Total/NA	Solid	3050B	
720-65322-27	MM-S-37	Total/NA	Solid	3050B	
LCS 720-183314/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 720-183314/3-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
LCSSRM 720-183314/25-A	Lab Control Sample	Total/NA	Solid	3050B	
MB 720-183314/1-A	Method Blank	Total/NA	Solid	3050B	

Analysis Batch: 183369

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-4	MM-SD-07	Total/NA	Solid	6010B	183309

Metals (Continued)

Analysis Batch: 183369 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-4 MS	MM-SD-07	Total/NA	Solid	6010B	183309
720-65322-4 MSD	MM-SD-07	Total/NA	Solid	6010B	183309
720-65322-5	MM-SD-08	Total/NA	Solid	6010B	183309
720-65322-6	MM-S-16	Total/NA	Solid	6010B	183309
720-65322-7	MM-S-17	Total/NA	Solid	6010B	183309
720-65322-8	MM-S-18	Total/NA	Solid	6010B	183309
720-65322-9	MM-S-19	Total/NA	Solid	6010B	183309
720-65322-10	MM-S-20	Total/NA	Solid	6010B	183309
720-65322-11	MM-S-21	Total/NA	Solid	6010B	183309
720-65322-12	MM-S-22	Total/NA	Solid	6010B	183309
720-65322-13	MM-S-23	Total/NA	Solid	6010B	183309
720-65322-14	MM-S-24	Total/NA	Solid	6010B	183309
720-65322-15	MM-S-25	Total/NA	Solid	6010B	183309
720-65322-16	MM-S-26	Total/NA	Solid	6010B	183309
720-65322-17	MM-S-27	Total/NA	Solid	6010B	183309
720-65322-18	MM-S-28	Total/NA	Solid	6010B	183309
720-65322-19	MM-S-29	Total/NA	Solid	6010B	183309
720-65322-20	MM-S-30	Total/NA	Solid	6010B	183309
720-65322-21	MM-S-31	Total/NA	Solid	6010B	183309
720-65322-22	MM-S-32	Total/NA	Solid	6010B	183309
LCS 720-183309/2-A	Lab Control Sample	Total/NA	Solid	6010B	183309
LCSD 720-183309/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	183309
LCSSRM 720-183309/25-A	Lab Control Sample	Total/NA	Solid	6010B	183309
MB 720-183309/1-A	Method Blank	Total/NA	Solid	6010B	183309

Analysis Batch: 183372

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-23	MM-S-33	Total/NA	Solid	6010B	183314
720-65322-24	MM-S-34	Total/NA	Solid	6010B	183314
720-65322-25	MM-S-35	Total/NA	Solid	6010B	183314
720-65322-26	MM-S-36	Total/NA	Solid	6010B	183314
720-65322-27	MM-S-37	Total/NA	Solid	6010B	183314
LCS 720-183314/2-A	Lab Control Sample	Total/NA	Solid	6010B	183314
LCSD 720-183314/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	183314
LCSSRM 720-183314/25-A	Lab Control Sample	Total/NA	Solid	6010B	183314
MB 720-183314/1-A	Method Blank	Total/NA	Solid	6010B	183314

Prep Batch: 183390

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-1	MM-SD-04	Total/NA	Solid	7471A	
720-65322-2	MM-SD-05	Total/NA	Solid	7471A	
720-65322-3	MM-SD-06	Total/NA	Solid	7471A	
720-65322-4	MM-SD-07	Total/NA	Solid	7471A	
720-65322-5	MM-SD-08	Total/NA	Solid	7471A	
720-65322-6	MM-S-16	Total/NA	Solid	7471A	
720-65322-7	MM-S-17	Total/NA	Solid	7471A	
720-65322-8	MM-S-18	Total/NA	Solid	7471A	
720-65322-9	MM-S-19	Total/NA	Solid	7471A	
720-65322-10	MM-S-20	Total/NA	Solid	7471A	
720-65322-11	MM-S-21	Total/NA	Solid	7471A	
720-65322-12	MM-S-22	Total/NA	Solid	7471A	

Metals (Continued)

Prep Batch: 183390 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-13	MM-S-23	Total/NA	Solid	7471A	
720-65322-14	MM-S-24	Total/NA	Solid	7471A	
720-65322-15	MM-S-25	Total/NA	Solid	7471A	
720-65322-16	MM-S-26	Total/NA	Solid	7471A	
720-65322-17	MM-S-27	Total/NA	Solid	7471A	
720-65322-18	MM-S-28	Total/NA	Solid	7471A	
LCS 720-183390/2-A	Lab Control Sample	Total/NA	Solid	7471A	
LCSD 720-183390/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	
MB 720-183390/1-A	Method Blank	Total/NA	Solid	7471A	

Prep Batch: 183393

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-19	MM-S-29	Total/NA	Solid	7471A	
720-65322-19 MS	MM-S-29	Total/NA	Solid	7471A	
720-65322-19 MSD	MM-S-29	Total/NA	Solid	7471A	
720-65322-20	MM-S-30	Total/NA	Solid	7471A	
720-65322-21	MM-S-31	Total/NA	Solid	7471A	
720-65322-22	MM-S-32	Total/NA	Solid	7471A	
720-65322-23	MM-S-33	Total/NA	Solid	7471A	
720-65322-24	MM-S-34	Total/NA	Solid	7471A	
720-65322-25	MM-S-35	Total/NA	Solid	7471A	
720-65322-26	MM-S-36	Total/NA	Solid	7471A	
720-65322-27	MM-S-37	Total/NA	Solid	7471A	
LCS 720-183393/2-A	Lab Control Sample	Total/NA	Solid	7471A	
LCSD 720-183393/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	
MB 720-183393/1-A	Method Blank	Total/NA	Solid	7471A	

Analysis Batch: 183409

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-23	MM-S-33	Total/NA	Solid	6010B	183314
720-65322-24	MM-S-34	Total/NA	Solid	6010B	183314
720-65322-25	MM-S-35	Total/NA	Solid	6010B	183314
720-65322-26	MM-S-36	Total/NA	Solid	6010B	183314
720-65322-27	MM-S-37	Total/NA	Solid	6010B	183314

Analysis Batch: 183413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-4	MM-SD-07	Total/NA	Solid	6010B	183309
720-65322-5	MM-SD-08	Total/NA	Solid	6010B	183309
720-65322-6	MM-S-16	Total/NA	Solid	6010B	183309
720-65322-7	MM-S-17	Total/NA	Solid	6010B	183309
720-65322-8	MM-S-18	Total/NA	Solid	6010B	183309
720-65322-9	MM-S-19	Total/NA	Solid	6010B	183309
720-65322-10	MM-S-20	Total/NA	Solid	6010B	183309
720-65322-11	MM-S-21	Total/NA	Solid	6010B	183309
720-65322-12	MM-S-22	Total/NA	Solid	6010B	183309
720-65322-13	MM-S-23	Total/NA	Solid	6010B	183309
720-65322-14	MM-S-24	Total/NA	Solid	6010B	183309
720-65322-15	MM-S-25	Total/NA	Solid	6010B	183309
720-65322-16	MM-S-26	Total/NA	Solid	6010B	183309
720-65322-17	MM-S-27	Total/NA	Solid	6010B	183309

Metals (Continued)

Analysis Batch: 183413 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-18	MM-S-28	Total/NA	Solid	6010B	183309
720-65322-20	MM-S-30	Total/NA	Solid	6010B	183309
720-65322-21	MM-S-31	Total/NA	Solid	6010B	183309
720-65322-22	MM-S-32	Total/NA	Solid	6010B	183309

Analysis Batch: 183414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-1	MM-SD-04	Total/NA	Solid	6010B	183308
720-65322-2	MM-SD-05	Total/NA	Solid	6010B	183308
720-65322-3	MM-SD-06	Total/NA	Solid	6010B	183308
LCS 720-183308/2-A	Lab Control Sample	Total/NA	Solid	6010B	183308
LCSD 720-183308/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	183308
LCSSRM 720-183308/19-A	Lab Control Sample	Total/NA	Solid	6010B	183308
MB 720-183308/1-A	Method Blank	Total/NA	Solid	6010B	183308

Analysis Batch: 183444

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-1	MM-SD-04	Total/NA	Solid	6010B	183308
720-65322-2	MM-SD-05	Total/NA	Solid	6010B	183308
720-65322-3	MM-SD-06	Total/NA	Solid	6010B	183308
LCSSRM 720-183308/19-A	Lab Control Sample	Total/NA	Solid	6010B	183308

Analysis Batch: 183445

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-19	MM-S-29	Total/NA	Solid	6010B	183309

Analysis Batch: 183573

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-1	MM-SD-04	Total/NA	Solid	7471A	183390
720-65322-2	MM-SD-05	Total/NA	Solid	7471A	183390
720-65322-3	MM-SD-06	Total/NA	Solid	7471A	183390
720-65322-4	MM-SD-07	Total/NA	Solid	7471A	183390
720-65322-5	MM-SD-08	Total/NA	Solid	7471A	183390
720-65322-6	MM-S-16	Total/NA	Solid	7471A	183390
720-65322-7	MM-S-17	Total/NA	Solid	7471A	183390
720-65322-8	MM-S-18	Total/NA	Solid	7471A	183390
720-65322-9	MM-S-19	Total/NA	Solid	7471A	183390
720-65322-10	MM-S-20	Total/NA	Solid	7471A	183390
720-65322-11	MM-S-21	Total/NA	Solid	7471A	183390
720-65322-12	MM-S-22	Total/NA	Solid	7471A	183390
720-65322-13	MM-S-23	Total/NA	Solid	7471A	183390
720-65322-14	MM-S-24	Total/NA	Solid	7471A	183390
720-65322-15	MM-S-25	Total/NA	Solid	7471A	183390
720-65322-16	MM-S-26	Total/NA	Solid	7471A	183390
720-65322-17	MM-S-27	Total/NA	Solid	7471A	183390
720-65322-18	MM-S-28	Total/NA	Solid	7471A	183390
LCS 720-183390/2-A	Lab Control Sample	Total/NA	Solid	7471A	183390
LCSD 720-183390/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	183390
MB 720-183390/1-A	Method Blank	Total/NA	Solid	7471A	183390

Metals (Continued)

Analysis Batch: 183648

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-19	MM-S-29	Total/NA	Solid	7471A	183393
720-65322-19 MS	MM-S-29	Total/NA	Solid	7471A	183393
720-65322-19 MSD	MM-S-29	Total/NA	Solid	7471A	183393
720-65322-20	MM-S-30	Total/NA	Solid	7471A	183393
720-65322-21	MM-S-31	Total/NA	Solid	7471A	183393
720-65322-22	MM-S-32	Total/NA	Solid	7471A	183393
720-65322-23	MM-S-33	Total/NA	Solid	7471A	183393
720-65322-24	MM-S-34	Total/NA	Solid	7471A	183393
720-65322-25	MM-S-35	Total/NA	Solid	7471A	183393
720-65322-26	MM-S-36	Total/NA	Solid	7471A	183393
720-65322-27	MM-S-37	Total/NA	Solid	7471A	183393
LCS 720-183393/2-A	Lab Control Sample	Total/NA	Solid	7471A	183393
LCSD 720-183393/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	183393
MB 720-183393/1-A	Method Blank	Total/NA	Solid	7471A	183393

General Chemistry

Leach Batch: 183237

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-1	MM-SD-04	Soluble	Solid	DI Leach	
720-65322-1 DU	MM-SD-04	Soluble	Solid	DI Leach	
720-65322-2	MM-SD-05	Soluble	Solid	DI Leach	
720-65322-3	MM-SD-06	Soluble	Solid	DI Leach	
720-65322-4	MM-SD-07	Soluble	Solid	DI Leach	
720-65322-5	MM-SD-08	Soluble	Solid	DI Leach	
720-65322-6	MM-S-16	Soluble	Solid	DI Leach	
720-65322-7	MM-S-17	Soluble	Solid	DI Leach	
720-65322-8	MM-S-18	Soluble	Solid	DI Leach	
720-65322-9	MM-S-19	Soluble	Solid	DI Leach	
720-65322-10	MM-S-20	Soluble	Solid	DI Leach	
720-65322-11	MM-S-21	Soluble	Solid	DI Leach	
720-65322-12	MM-S-22	Soluble	Solid	DI Leach	
720-65322-13	MM-S-23	Soluble	Solid	DI Leach	
720-65322-14	MM-S-24	Soluble	Solid	DI Leach	
720-65322-15	MM-S-25	Soluble	Solid	DI Leach	
720-65322-16	MM-S-26	Soluble	Solid	DI Leach	
720-65322-17	MM-S-27	Soluble	Solid	DI Leach	
720-65322-18	MM-S-28	Soluble	Solid	DI Leach	
720-65322-19	MM-S-29	Soluble	Solid	DI Leach	
720-65322-20	MM-S-30	Soluble	Solid	DI Leach	

Leach Batch: 183259

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-21	MM-S-31	Soluble	Solid	DI Leach	
720-65322-21 DU	MM-S-31	Soluble	Solid	DI Leach	
720-65322-22	MM-S-32	Soluble	Solid	DI Leach	
720-65322-23	MM-S-33	Soluble	Solid	DI Leach	
720-65322-24	MM-S-34	Soluble	Solid	DI Leach	
720-65322-25	MM-S-35	Soluble	Solid	DI Leach	
720-65322-26	MM-S-36	Soluble	Solid	DI Leach	

General Chemistry (Continued)

Leach Batch: 183259 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-27	MM-S-37	Soluble	Solid	DI Leach	

Analysis Batch: 183298

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-1	MM-SD-04	Soluble	Solid	9045C	183237
720-65322-1 DU	MM-SD-04	Soluble	Solid	9045C	183237
720-65322-2	MM-SD-05	Soluble	Solid	9045C	183237
720-65322-3	MM-SD-06	Soluble	Solid	9045C	183237
720-65322-4	MM-SD-07	Soluble	Solid	9045C	183237
720-65322-5	MM-SD-08	Soluble	Solid	9045C	183237
720-65322-6	MM-S-16	Soluble	Solid	9045C	183237
720-65322-7	MM-S-17	Soluble	Solid	9045C	183237
720-65322-8	MM-S-18	Soluble	Solid	9045C	183237
720-65322-9	MM-S-19	Soluble	Solid	9045C	183237
720-65322-10	MM-S-20	Soluble	Solid	9045C	183237
720-65322-11	MM-S-21	Soluble	Solid	9045C	183237
720-65322-12	MM-S-22	Soluble	Solid	9045C	183237
720-65322-13	MM-S-23	Soluble	Solid	9045C	183237
720-65322-14	MM-S-24	Soluble	Solid	9045C	183237
720-65322-15	MM-S-25	Soluble	Solid	9045C	183237
720-65322-16	MM-S-26	Soluble	Solid	9045C	183237
720-65322-17	MM-S-27	Soluble	Solid	9045C	183237
720-65322-18	MM-S-28	Soluble	Solid	9045C	183237
720-65322-19	MM-S-29	Soluble	Solid	9045C	183237
720-65322-20	MM-S-30	Soluble	Solid	9045C	183237
LCS 720-183298/1	Lab Control Sample	Total/NA	Solid	9045C	

Analysis Batch: 183321

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-21	MM-S-31	Soluble	Solid	9045C	183259
720-65322-21 DU	MM-S-31	Soluble	Solid	9045C	183259
720-65322-22	MM-S-32	Soluble	Solid	9045C	183259
720-65322-23	MM-S-33	Soluble	Solid	9045C	183259
720-65322-24	MM-S-34	Soluble	Solid	9045C	183259
720-65322-25	MM-S-35	Soluble	Solid	9045C	183259
720-65322-26	MM-S-36	Soluble	Solid	9045C	183259
720-65322-27	MM-S-37	Soluble	Solid	9045C	183259
LCS 720-183321/1	Lab Control Sample	Total/NA	Solid	9045C	

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-SD-04 — Lab Sample ID: 720-65322-1

Date Collected: 06/02/15 14:10 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183308	06/09/15 17:56	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183414	06/11/15 00:43	SLK	TAL PLS
Total/NA	Prep	3050B			183308	06/09/15 17:56	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183444	06/11/15 12:19	EFH	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		5	183573	06/12/15 20:40	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 16:28	EYT	TAL PLS

Client Sample ID: MM-SD-05 — Lab Sample ID: 720-65322-2

Date Collected: 06/02/15 14:25 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183308	06/09/15 17:56	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183414	06/11/15 00:48	SLK	TAL PLS
Total/NA	Prep	3050B			183308	06/09/15 17:56	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183444	06/11/15 12:24	EFH	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		100	183573	06/12/15 20:43	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 16:34	EYT	TAL PLS

Client Sample ID: MM-SD-06 — Lab Sample ID: 720-65322-3

Date Collected: 06/02/15 14:35 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183308	06/09/15 17:56	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183414	06/11/15 00:52	SLK	TAL PLS
Total/NA	Prep	3050B			183308	06/09/15 17:56	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183444	06/11/15 12:29	EFH	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		1000	183573	06/12/15 21:05	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 16:36	EYT	TAL PLS

Client Sample ID: MM-SD-07 — Lab Sample ID: 720-65322-4

Date Collected: 06/02/15 14:45 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS

Client Sample ID: MM-SD-07 — Lab Sample ID: 720-65322-4

Date Collected: 06/02/15 14:45 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6010B		4	183369	06/10/15 11:39	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 20:57	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		1000	183573	06/12/15 21:07	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 16:38	EYT	TAL PLS

Client Sample ID: MM-SD-08 — Lab Sample ID: 720-65322-5

Date Collected: 06/02/15 14:55 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 11:44	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 21:02	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		5	183573	06/12/15 22:03	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 16:40	EYT	TAL PLS

Client Sample ID: MM-S-16 — Lab Sample ID: 720-65322-6

Date Collected: 06/03/15 09:40 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 11:48	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 21:07	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		5	183573	06/12/15 22:05	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 16:46	EYT	TAL PLS

Client Sample ID: MM-S-17 — Lab Sample ID: 720-65322-7

Date Collected: 06/03/15 09:50 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 12:02	EFH	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-17 — Lab Sample ID: 720-65322-7

Date Collected: 06/03/15 09:50 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 21:12	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		5	183573	06/12/15 22:07	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 16:50	EYT	TAL PLS

Client Sample ID: MM-S-18 — Lab Sample ID: 720-65322-8

Date Collected: 06/03/15 10:00 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 12:07	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 21:16	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		100	183573	06/12/15 21:17	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 16:52	EYT	TAL PLS

Client Sample ID: MM-S-19 — Lab Sample ID: 720-65322-9

Date Collected: 06/03/15 10:10 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 12:12	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 21:21	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		100	183573	06/12/15 21:19	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 16:53	EYT	TAL PLS

Client Sample ID: MM-S-20 — Lab Sample ID: 720-65322-10

Date Collected: 06/03/15 10:25 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 12:16	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-20 — Lab Sample ID: 720-65322-10

Date Collected: 06/03/15 10:25 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6010B		1	183413	06/10/15 21:26	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		100	183573	06/12/15 21:22	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 16:56	EYT	TAL PLS

Client Sample ID: MM-S-21 — Lab Sample ID: 720-65322-11

Date Collected: 06/03/15 10:35 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 12:21	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 21:31	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		5	183573	06/12/15 22:10	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 16:59	EYT	TAL PLS

Client Sample ID: MM-S-22 — Lab Sample ID: 720-65322-12

Date Collected: 06/03/15 11:00 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 12:26	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 21:35	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		5	183573	06/12/15 22:13	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 17:03	EYT	TAL PLS

Client Sample ID: MM-S-23 — Lab Sample ID: 720-65322-13

Date Collected: 06/03/15 11:05 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 12:30	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 21:40	SLK	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-23 — Lab Sample ID: 720-65322-13

Date Collected: 06/03/15 11:05 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		100	183573	06/12/15 21:34	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 17:05	EYT	TAL PLS

Client Sample ID: MM-S-24 — Lab Sample ID: 720-65322-14

Date Collected: 06/03/15 11:15 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 12:35	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 21:54	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		100	183573	06/12/15 21:36	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 17:07	EYT	TAL PLS

Client Sample ID: MM-S-25 — Lab Sample ID: 720-65322-15

Date Collected: 06/03/15 11:25 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 12:39	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 21:59	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		100	183573	06/12/15 21:39	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 17:09	EYT	TAL PLS

Client Sample ID: MM-S-26 — Lab Sample ID: 720-65322-16

Date Collected: 06/03/15 11:35 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 12:44	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 22:04	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-26 — Lab Sample ID: 720-65322-16

Date Collected: 06/03/15 11:35
Date Received: 06/08/15 15:30
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7471A		100	183573	06/12/15 21:41	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 17:10	EYT	TAL PLS

Client Sample ID: MM-S-27 — Lab Sample ID: 720-65322-17

Date Collected: 06/03/15 11:45
Date Received: 06/08/15 15:30
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 12:58	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 22:08	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		5	183573	06/12/15 22:15	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 17:12	EYT	TAL PLS

Client Sample ID: MM-S-28 — Lab Sample ID: 720-65322-18

Date Collected: 06/03/15 12:05
Date Received: 06/08/15 15:30
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 13:03	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 22:13	SLK	TAL PLS
Total/NA	Prep	7471A			183390	06/10/15 19:24	ASB	TAL PLS
Total/NA	Analysis	7471A		100	183573	06/12/15 21:46	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 17:14	EYT	TAL PLS

Client Sample ID: MM-S-29 — Lab Sample ID: 720-65322-19

Date Collected: 06/03/15 12:15
Date Received: 06/08/15 15:30
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 13:07	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183445	06/11/15 12:44	EFH	TAL PLS
Total/NA	Prep	7471A			183393	06/10/15 19:56	ECT	TAL PLS
Total/NA	Analysis	7471A		100	183648	06/15/15 16:29	SLK	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-29 — Lab Sample ID: 720-65322-19

Date Collected: 06/03/15 12:15 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 17:15	EYT	TAL PLS

Client Sample ID: MM-S-30 — Lab Sample ID: 720-65322-20

Date Collected: 06/03/15 12:20 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 13:12	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 22:23	SLK	TAL PLS
Total/NA	Prep	7471A			183393	06/10/15 19:56	ECT	TAL PLS
Total/NA	Analysis	7471A		100	183648	06/15/15 16:31	SLK	TAL PLS
Soluble	Leach	DI Leach			183237	06/09/15 09:55	EYT	TAL PLS
Soluble	Analysis	9045C		1	183298	06/09/15 17:19	EYT	TAL PLS

Client Sample ID: MM-S-31 — Lab Sample ID: 720-65322-21

Date Collected: 06/03/15 12:30 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 13:17	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 22:27	SLK	TAL PLS
Total/NA	Prep	7471A			183393	06/10/15 19:56	ECT	TAL PLS
Total/NA	Analysis	7471A		100	183648	06/15/15 16:33	SLK	TAL PLS
Soluble	Leach	DI Leach			183259	06/09/15 17:58	MJK	TAL PLS
Soluble	Analysis	9045C		1	183321	06/09/15 21:41	EYT	TAL PLS

Client Sample ID: MM-S-32 — Lab Sample ID: 720-65322-22

Date Collected: 06/03/15 12:35 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183369	06/10/15 13:21	EFH	TAL PLS
Total/NA	Prep	3050B			183309	06/09/15 18:43	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183413	06/10/15 22:32	SLK	TAL PLS
Total/NA	Prep	7471A			183393	06/10/15 19:56	ECT	TAL PLS
Total/NA	Analysis	7471A		100	183648	06/15/15 16:36	SLK	TAL PLS
Soluble	Leach	DI Leach			183259	06/09/15 17:58	MJK	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-32 — Lab Sample ID: 720-65322-22

Date Collected: 06/03/15 12:35 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Analysis	9045C		1	183321	06/09/15 21:47	EYT	TAL PLS

Client Sample ID: MM-S-33 — Lab Sample ID: 720-65322-23

Date Collected: 06/03/15 12:40 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183314	06/09/15 19:21	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183372	06/10/15 13:00	EFH	TAL PLS
Total/NA	Prep	3050B			183314	06/09/15 19:21	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183409	06/10/15 20:33	SLK	TAL PLS
Total/NA	Prep	7471A			183393	06/10/15 19:56	ECT	TAL PLS
Total/NA	Analysis	7471A		100	183648	06/15/15 16:40	SLK	TAL PLS
Soluble	Leach	DI Leach			183259	06/09/15 17:58	MJK	TAL PLS
Soluble	Analysis	9045C		1	183321	06/09/15 21:48	EYT	TAL PLS

Client Sample ID: MM-S-34 — Lab Sample ID: 720-65322-24

Date Collected: 06/03/15 12:55 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183314	06/09/15 19:21	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183372	06/10/15 13:05	EFH	TAL PLS
Total/NA	Prep	3050B			183314	06/09/15 19:21	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183409	06/10/15 20:38	SLK	TAL PLS
Total/NA	Prep	7471A			183393	06/10/15 19:56	ECT	TAL PLS
Total/NA	Analysis	7471A		100	183648	06/15/15 16:47	SLK	TAL PLS
Soluble	Leach	DI Leach			183259	06/09/15 17:58	MJK	TAL PLS
Soluble	Analysis	9045C		1	183321	06/09/15 21:51	EYT	TAL PLS

Client Sample ID: MM-S-35 — Lab Sample ID: 720-65322-25

Date Collected: 06/03/15 13:05 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183314	06/09/15 19:21	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183372	06/10/15 13:21	EFH	TAL PLS
Total/NA	Prep	3050B			183314	06/09/15 19:21	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183409	06/10/15 20:43	SLK	TAL PLS
Total/NA	Prep	7471A			183393	06/10/15 19:56	ECT	TAL PLS
Total/NA	Analysis	7471A		100	183648	06/15/15 16:50	SLK	TAL PLS
Soluble	Leach	DI Leach			183259	06/09/15 17:58	MJK	TAL PLS
Soluble	Analysis	9045C		1	183321	06/09/15 21:52	EYT	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Client Sample ID: MM-S-36

Lab Sample ID: 720-65322-26

Date Collected: 06/03/15 13:10
Date Received: 06/08/15 15:30

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183314	06/09/15 19:21	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183372	06/10/15 13:25	EFH	TAL PLS
Total/NA	Prep	3050B			183314	06/09/15 19:21	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183409	06/10/15 20:48	SLK	TAL PLS
Total/NA	Prep	7471A			183393	06/10/15 19:56	ECT	TAL PLS
Total/NA	Analysis	7471A		1	183648	06/15/15 17:31	SLK	TAL PLS
Soluble	Leach	DI Leach			183259	06/09/15 17:58	MJK	TAL PLS
Soluble	Analysis	9045C		1	183321	06/09/15 21:55	EYT	TAL PLS

Client Sample ID: MM-S-37

Lab Sample ID: 720-65322-27

Date Collected: 06/03/15 13:20
Date Received: 06/08/15 15:30

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			183314	06/09/15 19:21	CTD	TAL PLS
Total/NA	Analysis	6010B		4	183372	06/10/15 13:30	EFH	TAL PLS
Total/NA	Prep	3050B			183314	06/09/15 19:21	CTD	TAL PLS
Total/NA	Analysis	6010B		1	183409	06/10/15 20:53	SLK	TAL PLS
Total/NA	Prep	7471A			183393	06/10/15 19:56	ECT	TAL PLS
Total/NA	Analysis	7471A		100	183648	06/15/15 16:54	SLK	TAL PLS
Soluble	Leach	DI Leach			183259	06/09/15 17:58	MJK	TAL PLS
Soluble	Analysis	9045C		1	183321	06/09/15 21:57	EYT	TAL PLS

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-16

Method Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL PLS
7471A	Mercury (CVAA)	SW846	TAL PLS
9045C	pH	SW846	TAL PLS

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-65322-1	MM-SD-04	Solid	06/02/15 14:10	06/08/15 15:30
720-65322-2	MM-SD-05	Solid	06/02/15 14:25	06/08/15 15:30
720-65322-3	MM-SD-06	Solid	06/02/15 14:35	06/08/15 15:30
720-65322-4	MM-SD-07	Solid	06/02/15 14:45	06/08/15 15:30
720-65322-5	MM-SD-08	Solid	06/02/15 14:55	06/08/15 15:30
720-65322-6	MM-S-16	Solid	06/03/15 09:40	06/08/15 15:30
720-65322-7	MM-S-17	Solid	06/03/15 09:50	06/08/15 15:30
720-65322-8	MM-S-18	Solid	06/03/15 10:00	06/08/15 15:30
720-65322-9	MM-S-19	Solid	06/03/15 10:10	06/08/15 15:30
720-65322-10	MM-S-20	Solid	06/03/15 10:25	06/08/15 15:30
720-65322-11	MM-S-21	Solid	06/03/15 10:35	06/08/15 15:30
720-65322-12	MM-S-22	Solid	06/03/15 11:00	06/08/15 15:30
720-65322-13	MM-S-23	Solid	06/03/15 11:05	06/08/15 15:30
720-65322-14	MM-S-24	Solid	06/03/15 11:15	06/08/15 15:30
720-65322-15	MM-S-25	Solid	06/03/15 11:25	06/08/15 15:30
720-65322-16	MM-S-26	Solid	06/03/15 11:35	06/08/15 15:30
720-65322-17	MM-S-27	Solid	06/03/15 11:45	06/08/15 15:30
720-65322-18	MM-S-28	Solid	06/03/15 12:05	06/08/15 15:30
720-65322-19	MM-S-29	Solid	06/03/15 12:15	06/08/15 15:30
720-65322-20	MM-S-30	Solid	06/03/15 12:20	06/08/15 15:30
720-65322-21	MM-S-31	Solid	06/03/15 12:30	06/08/15 15:30
720-65322-22	MM-S-32	Solid	06/03/15 12:35	06/08/15 15:30
720-65322-23	MM-S-33	Solid	06/03/15 12:40	06/08/15 15:30
720-65322-24	MM-S-34	Solid	06/03/15 12:55	06/08/15 15:30
720-65322-25	MM-S-35	Solid	06/03/15 13:05	06/08/15 15:30
720-65322-26	MM-S-36	Solid	06/03/15 13:10	06/08/15 15:30
720-65322-27	MM-S-37	Solid	06/03/15 13:20	06/08/15 15:30

161662

ERRG
Engineering / Remediation Resources Group, Inc.
115 Sansome Street, Suite 200
San Francisco, CA 94104
Phone: (415) 395-9974
Fax: (415) 395-9983

720-65322

Lab No.
Address

6/15/2015

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To):	California EDF Report? ☐ Yes ☐ No
Laboratory: TestAmerica	Electronic Deliverables To (Email Address): Samantha.Caruthers-Knight@errg.com
Phone No.: / Fax No.:	Sampler : SCKnight
Project Number: 2014-083 / Phase # / Task # 8.02	
Project Name: Mammoth Mill PA/SI	Project Address: Mammoth Lakes
Project Manager: Samantha Caruthers-Knight	

Analysis Request

Sample Designation	Sampling Date	Sampling Time	Container: 8 oz Jar	Matrix: Soil	Matrix: Water	Cam 17 Metals	Paste pH	Hold	12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
MM-SD-04	6/2/15	1410	2	X		X	X		std	2		
MM-SD-05	6/2/15	1425	2	X		X	X		std	2		
MM-SD-06	6/2/15	1435	2	X		X	X		std	2		
MM-SD-07	6/2/15	1445	2	X		X	X		std	2		
MM-SD-08	6/2/15	1455	2	X		X	X		std	2		
MM-S-16	6/3/15	940	2	X		X	X		std	2		
MM-S-17	6/3/15	950	2	X		X	X		std	2		
MM-S-18	6/3/15	1000	2	X		X	X		std	2		
MM-S-19	6/3/15	1010	2	X		X	X		std	2		
MM-S-20	6/3/15	1025	2	X		X	X		std	2		

Relinquished by:	Date	Time	Received by:
[signature]	6/16/15	1250	[signature]
[signature]	6-18-15	1530	[signature]

Remarks:
6/18/15 CAT
2°/1.5°

Bill to: Engineering / Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, CA 94553

720-65322 Chain of Custody

161662

ERRG

Engineering / Remediation Resources Group, Inc.
115 Sansome Street, Suite 200
San Francisco, CA 94104
Phone: (415) 395-9974
Fax: (415) 395-9983

720-65322

Lab No.
Address

6/15/2015

Project Contact (Hardcopy or PDF To):		California EDF Report? ☐ Yes ☐ No
Laboratory: TestAmerica		Electronic Deliverables To (Email Address): Samantha.Caruthers-Knight@errg.com
Phone No.:	Fax No.:	Sampler : SCKnight
Project Number: 2014-083	Phase # / Task # 8.02	
Project Name: Mammoth Mill PA/SI		Project Address: Mammoth Lakes
Project Manager: Samantha Caruthers-Knight		

Chain-of-Custody Record and Analysis Request

Sample	Designation	Sampling Date	Sampling Time	Container: 8 oz Jar					Matrix: Soil	Water		Analysis Request: Cam 17 Metals	Paste pH	Hold								12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
MM-S-21		6/3/15	1035	2					X			X	X									std	2		
MM-S-22		6/3/15	1100	2					X			X	X									std	2		
MM-S-23		6/3/15	1105	2					X			X	X									std	2		
MM-S-24		6/3/15	1115	2					X			X	X									std	2		
MM-S-25		6/3/15	1125	2					X			X	X									std	2		
MM-S-26		6/3/15	1135	2					X			X	X									std	2		
MM-S-27		6/3/15	1145	2					X			X	X									std	2		
MM-S-28		6/3/15	1205	2					X			X	X									std	2		
MM-S-29		6/3/15	1215	2					X			X	X									std	2		
MM-S-30		6/3/15	1220	2					X			X	X									std	2		

Relinquished by:	Date	Time	Received by:
[signature]	6/15/15	1450	[signature]
Relinquished by: [signature]	Date 6-8-15	Time 1530	Received by: [signature]
Relinquished by:	Date	Time	Received by Laboratory:

Remarks:

Bill to: Engineering / Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, CA 94553

161662

ERRG

Engineering / Remediation Resources Group, Inc.
115 Sansome Street, Suite 200
San Francisco, CA 94104
Phone: (415) 395-9974
Fax: (415) 395-9983

720-65322

Lab No.
Address

6/15/2015

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To):	California EDF Report? ☐ Yes ☐ No
Laboratory: TestAmerica	Electronic Deliverables To (Email Address): Samantha.Caruthers-Knight@errg.com
Phone No.: / Fax No.:	Sampler : SCKnight
Project Number: 2014-083 / Phase # / Task # 8.02	
Project Name: Mammoth Mill PA/SI	Project Address: Mammoth Lakes
Project Manager: Samantha Caruthers-Knight	

Sample Designation	Sampling Date	Sampling Time	Container: 8 oz Jar	Matrix: Soil	Matrix: Water	Analysis Request: Cam 17 Metals	Paste pH	Hold	12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
MM-S-31	6/3/15	1230	2	X		X	X		std	2		
MM-S-32	6/3/15	1235	2	X		X	X		std	2		
MM-S-33	6/3/15	1240	2	X		X	X		std	2		
MM-S-34	6/3/15	1255	2	X		X	X		std	2		
MM-S-35	6/3/15	1305	2	X		X	X		std	2		
MM-S-36	6/3/15	1310	2	X		X	X		std	2		
MM-S-37	6/3/15	1320	2	X		X	X		std	2		
MM-BG-02	6/3/15	1450	2	X		X	X	X	std	2		
MM-BG-03	6/3/15	1500	2	X		X	X	X	std	2		
MM-BG-04	6/3/15	1510	2	X		X	X	X	std	2		

Relinquished by:	Date	Time	Received by:
[signature]	6/4/15	1250	[signature]
Relinquished by: [signature]	6-8-15	1530	Received by: [signature]
Relinquished by:	Date	Time	Received by Laboratory:

Remarks:

Bill to: Engineering / Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, CA 94553

161662

ERRG

Engineering / Remediation Resources Group, Inc.
115 Sansome Street, Suite 200
San Francisco, CA 94104
Phone: (415) 395-9974
Fax: (415) 395-9983

720-65322

Lab No. _____
Address _____

6/15/2015

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To):	California EDF Report? ☐ Yes ☐ No
Laboratory: TestAmerica	Electronic Deliverables To (Email Address): Samantha.Caruthers-Knight@errg.com
Phone No.: / Fax No.:	Sampler : SCKnight
Project Number: 2014-083 / Phase # / Task # 8.02	
Project Name: Mammoth Mill PA/SI	Project Address: Mammoth Lakes
Project Manager: Samantha Caruthers-Knight	

Sample Designation	Sampling Date	Sampling Time	Container: 8 oz Jar	Matrix: Soil	Matrix: Water	Analysis Request: Cam 17 Metals	Paste pH	Hold	12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
MM-BG-05	6/3/15	1525	2	X		X	X	X	std	2		
MM-BG-06	6/3/15	1535	2	X		X	X	X	std	2		
MM-BG-07	6/3/15	1540	2	X		X	X	X	std	2		
MM-BG-08	6/3/15	1600	2	X		X	X	X	std	2		
MM-BG-09	6/3/15	1615	2	X		X	X	X	std	2		
MM-BG-10	6/3/15	1625	2	X		X	X	X	std	2		

Relinquished by:	Date	Time	Received by:
	6/5/15	1450	
Relinquished by:	Date	Time	Received by:
	6-8-15	1530	
Relinquished by:	Date	Time	Received by Laboratory:

Remarks:

Bill to: Engineering / Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, CA 94553

Login Sample Receipt Checklist

Client: Engineering Remediation Resources Group.

Job Number: 720-65322-1

Login Number: 65322
List Number: 1
Creator: Gonzales, Justinn

List Source: TestAmerica Pleasanton

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-65322-2
Client Project/Site: Mammoth PA/SI

For:
Engineering Remediation Resources Group.
4585 Pacheco Boulevard
Suite 200
Martinez, California 94553-2233

Attn: Ms. Samantha C Knight

Authorized for release by:
6/29/2015 6:13:35 PM
Micah Smith, Project Manager II
(925)484-1919
micah.smith@testamericainc.com

Designee for

Dimple Sharma, Senior Project Manager
(925)484-1919
dimple.sharma@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 720-65322-2

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-65322-2

Comments
No additional comments.

Receipt
The samples were received on 6/8/2015 3:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.5º C and 2.0º C.

Metals
Method(s) 6010B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 720-184205 and analytical batch 720-184297 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 6010B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 720-184205 and analytical batch 720-184384 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 6010B: The serial dilution performed for the following sample associated with batch 720-184384 was outside control limits: (720-65322-A-31-C SD)

Method(s) 7471A: The matrix spike / matrix spike duplicate / sample duplicate (MS/MSD/DUP) precision for preparation batch 720-184214 and analytical batch 720-184337 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) precision was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-02 — Lab Sample ID: 720-65322-28

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.40	J	0.41	0.068	mg/Kg	1		6010B	Total/NA
Arsenic	5.6		3.3	0.28	mg/Kg	4		6010B	Total/NA
Barium	83		1.6	0.23	mg/Kg	4		6010B	Total/NA
Beryllium	0.11		0.082	0.027	mg/Kg	1		6010B	Total/NA
Cadmium	0.12		0.10	0.010	mg/Kg	1		6010B	Total/NA
Chromium	5.7		1.6	0.17	mg/Kg	4		6010B	Total/NA
Cobalt	3.8		0.66	0.066	mg/Kg	4		6010B	Total/NA
Copper	6.9		4.9	2.3	mg/Kg	4		6010B	Total/NA
Lead	8.6		1.6	0.34	mg/Kg	4		6010B	Total/NA
Molybdenum	0.41		0.41	0.052	mg/Kg	1		6010B	Total/NA
Nickel	12		1.6	0.17	mg/Kg	4		6010B	Total/NA
Selenium	0.18	J	0.82	0.12	mg/Kg	1		6010B	Total/NA
Silver	0.056	J	0.20	0.041	mg/Kg	1		6010B	Total/NA
Vanadium	18		1.6	0.22	mg/Kg	4		6010B	Total/NA
Zinc	35		4.9	2.1	mg/Kg	4		6010B	Total/NA
Mercury	0.17	F1 B	0.0090	0.0022	mg/Kg	1		7471A	Total/NA

Client Sample ID: MM-BG-03 — Lab Sample ID: 720-65322-29

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.88		0.35	0.058	mg/Kg	1		6010B	Total/NA
Arsenic	6.9		2.8	0.24	mg/Kg	4		6010B	Total/NA
Barium	200		1.4	0.20	mg/Kg	4		6010B	Total/NA
Beryllium	0.11		0.070	0.023	mg/Kg	1		6010B	Total/NA
Cadmium	0.15		0.087	0.0087	mg/Kg	1		6010B	Total/NA
Chromium	12		1.4	0.15	mg/Kg	4		6010B	Total/NA
Cobalt	7.0		0.56	0.056	mg/Kg	4		6010B	Total/NA
Copper	21		4.2	2.0	mg/Kg	4		6010B	Total/NA
Lead	9.5		1.4	0.29	mg/Kg	4		6010B	Total/NA
Molybdenum	0.34	J	0.35	0.045	mg/Kg	1		6010B	Total/NA
Nickel	22		1.4	0.14	mg/Kg	4		6010B	Total/NA
Selenium	0.21	J	0.70	0.10	mg/Kg	1		6010B	Total/NA
Silver	0.32		0.17	0.035	mg/Kg	1		6010B	Total/NA
Vanadium	38		1.4	0.19	mg/Kg	4		6010B	Total/NA
Zinc	50		4.2	1.8	mg/Kg	4		6010B	Total/NA
Mercury	0.32	B	0.0092	0.0023	mg/Kg	1		7471A	Total/NA

Client Sample ID: MM-BG-04 — Lab Sample ID: 720-65322-30

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.37	J	0.39	0.065	mg/Kg	1		6010B	Total/NA
Arsenic	4.9		3.1	0.27	mg/Kg	4		6010B	Total/NA
Barium	120		1.6	0.22	mg/Kg	4		6010B	Total/NA
Beryllium	0.19		0.079	0.026	mg/Kg	1		6010B	Total/NA
Cadmium	0.13		0.098	0.0098	mg/Kg	1		6010B	Total/NA
Chromium	6.6		1.6	0.17	mg/Kg	4		6010B	Total/NA
Cobalt	4.8		0.63	0.063	mg/Kg	4		6010B	Total/NA
Copper	10		4.7	2.2	mg/Kg	4		6010B	Total/NA
Lead	9.1		1.6	0.33	mg/Kg	4		6010B	Total/NA
Molybdenum	0.47		0.39	0.050	mg/Kg	1		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-04 (Continued) — Lab Sample ID: 720-65322-30

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nickel	15		1.6	0.16	mg/Kg	4		6010B	Total/NA
Vanadium	21		1.6	0.21	mg/Kg	4		6010B	Total/NA
Zinc	36		4.7	2.0	mg/Kg	4		6010B	Total/NA
Mercury	0.21	B	0.0088	0.0022	mg/Kg	1		7471A	Total/NA

Client Sample ID: MM-BG-05 — Lab Sample ID: 720-65322-31

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.12	J F1	0.48	0.080	mg/Kg	1		6010B	Total/NA
Arsenic	5.1		3.8	0.33	mg/Kg	4		6010B	Total/NA
Barium	80		1.9	0.27	mg/Kg	4		6010B	Total/NA
Cadmium	0.049	J	0.12	0.012	mg/Kg	1		6010B	Total/NA
Chromium	7.3		1.9	0.20	mg/Kg	4		6010B	Total/NA
Cobalt	3.5		0.77	0.077	mg/Kg	4		6010B	Total/NA
Copper	5.8		5.8	2.7	mg/Kg	4		6010B	Total/NA
Lead	8.9		1.9	0.40	mg/Kg	4		6010B	Total/NA
Molybdenum	0.61	F1	0.48	0.062	mg/Kg	1		6010B	Total/NA
Nickel	11		1.9	0.20	mg/Kg	4		6010B	Total/NA
Selenium	0.73	J B	0.96	0.14	mg/Kg	1		6010B	Total/NA
Silver	0.18	J F1	0.24	0.049	mg/Kg	1		6010B	Total/NA
Vanadium	22		1.9	0.26	mg/Kg	4		6010B	Total/NA
Zinc	23		1.4	0.61	mg/Kg	1		6010B	Total/NA
Mercury	1.4	B	0.085	0.021	mg/Kg	10		7471A	Total/NA

Client Sample ID: MM-BG-06 — Lab Sample ID: 720-65322-32

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	3.9		3.6	0.30	mg/Kg	4		6010B	Total/NA
Barium	92		1.8	0.25	mg/Kg	4		6010B	Total/NA
Chromium	6.1		1.8	0.19	mg/Kg	4		6010B	Total/NA
Cobalt	2.5		0.71	0.071	mg/Kg	4		6010B	Total/NA
Copper	3.8		1.3	0.64	mg/Kg	1		6010B	Total/NA
Lead	6.1		1.8	0.38	mg/Kg	4		6010B	Total/NA
Molybdenum	0.52		0.45	0.057	mg/Kg	1		6010B	Total/NA
Nickel	7.2		1.8	0.18	mg/Kg	4		6010B	Total/NA
Selenium	0.72	J B	0.89	0.13	mg/Kg	1		6010B	Total/NA
Silver	0.10	J	0.22	0.045	mg/Kg	1		6010B	Total/NA
Vanadium	23		1.8	0.24	mg/Kg	4		6010B	Total/NA
Zinc	19		1.3	0.57	mg/Kg	1		6010B	Total/NA
Mercury	0.39	B	0.0086	0.0021	mg/Kg	1		7471A	Total/NA

Client Sample ID: MM-BG-07 — Lab Sample ID: 720-65322-33

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.22	J	0.41	0.068	mg/Kg	1		6010B	Total/NA
Arsenic	9.0		3.3	0.28	mg/Kg	4		6010B	Total/NA
Barium	180		1.6	0.23	mg/Kg	4		6010B	Total/NA
Cadmium	0.10		0.10	0.010	mg/Kg	1		6010B	Total/NA
Chromium	6.8		1.6	0.17	mg/Kg	4		6010B	Total/NA
Cobalt	4.2		0.66	0.066	mg/Kg	4		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-07 (Continued) — Lab Sample ID: 720-65322-33

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Copper	12		4.9	2.3	mg/Kg	4		6010B	Total/NA
Lead	39		1.6	0.34	mg/Kg	4		6010B	Total/NA
Molybdenum	0.50		0.41	0.052	mg/Kg	1		6010B	Total/NA
Nickel	19		1.6	0.17	mg/Kg	4		6010B	Total/NA
Selenium	0.67	J B	0.82	0.12	mg/Kg	1		6010B	Total/NA
Silver	0.35		0.20	0.041	mg/Kg	1		6010B	Total/NA
Vanadium	21		1.6	0.22	mg/Kg	4		6010B	Total/NA
Zinc	58		1.2	0.52	mg/Kg	1		6010B	Total/NA
Mercury	0.24	B	0.0097	0.0024	mg/Kg	1		7471A	Total/NA

Client Sample ID: MM-BG-08 — Lab Sample ID: 720-65322-34

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.077	J	0.40	0.067	mg/Kg	1		6010B	Total/NA
Arsenic	12		3.2	0.27	mg/Kg	4		6010B	Total/NA
Barium	240		1.6	0.23	mg/Kg	4		6010B	Total/NA
Cadmium	0.058	J	0.10	0.010	mg/Kg	1		6010B	Total/NA
Chromium	9.0		1.6	0.17	mg/Kg	4		6010B	Total/NA
Cobalt	5.4		0.65	0.065	mg/Kg	4		6010B	Total/NA
Copper	9.9		4.8	2.3	mg/Kg	4		6010B	Total/NA
Lead	9.5		1.6	0.34	mg/Kg	4		6010B	Total/NA
Molybdenum	0.48		0.40	0.052	mg/Kg	1		6010B	Total/NA
Nickel	18		1.6	0.16	mg/Kg	4		6010B	Total/NA
Selenium	0.75	J B	0.81	0.12	mg/Kg	1		6010B	Total/NA
Silver	0.33		0.20	0.041	mg/Kg	1		6010B	Total/NA
Vanadium	30		1.6	0.22	mg/Kg	4		6010B	Total/NA
Zinc	32		1.2	0.51	mg/Kg	1		6010B	Total/NA
Mercury	0.62	B	0.0092	0.0023	mg/Kg	1		7471A	Total/NA

Client Sample ID: MM-BG-09 — Lab Sample ID: 720-65322-35

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.084	J	0.46	0.077	mg/Kg	1		6010B	Total/NA
Arsenic	11		3.7	0.31	mg/Kg	4		6010B	Total/NA
Barium	150		1.9	0.26	mg/Kg	4		6010B	Total/NA
Cadmium	0.051	J	0.12	0.011	mg/Kg	1		6010B	Total/NA
Chromium	3.9		1.9	0.20	mg/Kg	4		6010B	Total/NA
Cobalt	2.9		0.74	0.074	mg/Kg	4		6010B	Total/NA
Copper	5.4		1.4	0.66	mg/Kg	1		6010B	Total/NA
Lead	6.5		1.9	0.39	mg/Kg	4		6010B	Total/NA
Molybdenum	0.46		0.46	0.059	mg/Kg	1		6010B	Total/NA
Nickel	6.1		1.9	0.19	mg/Kg	4		6010B	Total/NA
Selenium	0.51	J B	0.93	0.14	mg/Kg	1		6010B	Total/NA
Silver	0.37		0.23	0.047	mg/Kg	1		6010B	Total/NA
Vanadium	21		1.9	0.25	mg/Kg	4		6010B	Total/NA
Zinc	21		1.4	0.59	mg/Kg	1		6010B	Total/NA
Mercury	0.32	B	0.0086	0.0021	mg/Kg	1		7471A	Total/NA

Client Sample ID: MM-BG-10 — Lab Sample ID: 720-65322-36

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-10 (Continued)

Lab Sample ID: 720-65322-36

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.11	J	0.38	0.063	mg/Kg	1		6010B	Total/NA
Arsenic	25		3.1	0.26	mg/Kg	4		6010B	Total/NA
Barium	230		1.5	0.22	mg/Kg	4		6010B	Total/NA
Cadmium	0.071	J	0.095	0.0095	mg/Kg	1		6010B	Total/NA
Chromium	5.0		1.5	0.16	mg/Kg	4		6010B	Total/NA
Cobalt	3.2		0.61	0.061	mg/Kg	4		6010B	Total/NA
Copper	7.3		4.6	2.2	mg/Kg	4		6010B	Total/NA
Lead	10		1.5	0.32	mg/Kg	4		6010B	Total/NA
Molybdenum	0.52		0.38	0.049	mg/Kg	1		6010B	Total/NA
Nickel	7.4		1.5	0.16	mg/Kg	4		6010B	Total/NA
Selenium	0.39	J B	0.76	0.11	mg/Kg	1		6010B	Total/NA
Silver	0.44		0.19	0.039	mg/Kg	1		6010B	Total/NA
Vanadium	25		1.5	0.21	mg/Kg	4		6010B	Total/NA
Zinc	28		1.1	0.48	mg/Kg	1		6010B	Total/NA
Mercury	3.2	B	0.88	0.22	mg/Kg	100		7471A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-02

Lab Sample ID: 720-65322-28

Date Collected: 06/03/15 14:50
Date Received: 06/08/15 15:30

Matrix: Solid

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.40	J	0.41	0.068	mg/Kg		06/23/15 22:42	06/25/15 21:45	1
Arsenic	5.6		3.3	0.28	mg/Kg		06/23/15 22:42	06/24/15 19:53	4
Barium	83		1.6	0.23	mg/Kg		06/23/15 22:42	06/24/15 19:53	4
Beryllium	0.11		0.082	0.027	mg/Kg		06/23/15 22:42	06/25/15 21:45	1
Cadmium	0.12		0.10	0.010	mg/Kg		06/23/15 22:42	06/25/15 21:45	1
Chromium	5.7		1.6	0.17	mg/Kg		06/23/15 22:42	06/24/15 19:53	4
Cobalt	3.8		0.66	0.066	mg/Kg		06/23/15 22:42	06/24/15 19:53	4
Copper	6.9		4.9	2.3	mg/Kg		06/23/15 22:42	06/24/15 19:53	4
Lead	8.6		1.6	0.34	mg/Kg		06/23/15 22:42	06/24/15 19:53	4
Molybdenum	0.41		0.41	0.052	mg/Kg		06/23/15 22:42	06/25/15 21:45	1
Nickel	12		1.6	0.17	mg/Kg		06/23/15 22:42	06/24/15 19:53	4
Selenium	0.18	J	0.82	0.12	mg/Kg		06/23/15 22:42	06/25/15 21:45	1
Silver	0.056	J	0.20	0.041	mg/Kg		06/23/15 22:42	06/25/15 21:45	1
Thallium	ND		0.41	0.12	mg/Kg		06/23/15 22:42	06/25/15 21:45	1
Vanadium	18		1.6	0.22	mg/Kg		06/23/15 22:42	06/24/15 19:53	4
Zinc	35		4.9	2.1	mg/Kg		06/23/15 22:42	06/24/15 19:53	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.17	F1 B	0.0090	0.0022	mg/Kg		06/24/15 21:47	06/26/15 16:59	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-03

Lab Sample ID: 720-65322-29

Date Collected: 06/03/15 15:00
Matrix: Solid
Date Received: 06/08/15 15:30

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.88		0.35	0.058	mg/Kg		06/23/15 22:42	06/25/15 21:50	1
Arsenic	6.9		2.8	0.24	mg/Kg		06/23/15 22:42	06/24/15 19:58	4
Barium	200		1.4	0.20	mg/Kg		06/23/15 22:42	06/24/15 19:58	4
Beryllium	0.11		0.070	0.023	mg/Kg		06/23/15 22:42	06/25/15 21:50	1
Cadmium	0.15		0.087	0.0087	mg/Kg		06/23/15 22:42	06/25/15 21:50	1
Chromium	12		1.4	0.15	mg/Kg		06/23/15 22:42	06/24/15 19:58	4
Cobalt	7.0		0.56	0.056	mg/Kg		06/23/15 22:42	06/24/15 19:58	4
Copper	21		4.2	2.0	mg/Kg		06/23/15 22:42	06/24/15 19:58	4
Lead	9.5		1.4	0.29	mg/Kg		06/23/15 22:42	06/24/15 19:58	4
Molybdenum	0.34	J	0.35	0.045	mg/Kg		06/23/15 22:42	06/25/15 21:50	1
Nickel	22		1.4	0.14	mg/Kg		06/23/15 22:42	06/24/15 19:58	4
Selenium	0.21	J	0.70	0.10	mg/Kg		06/23/15 22:42	06/25/15 21:50	1
Silver	0.32		0.17	0.035	mg/Kg		06/23/15 22:42	06/25/15 21:50	1
Thallium	ND		0.35	0.10	mg/Kg		06/23/15 22:42	06/25/15 21:50	1
Vanadium	38		1.4	0.19	mg/Kg		06/23/15 22:42	06/24/15 19:58	4
Zinc	50		4.2	1.8	mg/Kg		06/23/15 22:42	06/24/15 19:58	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.32	B	0.0092	0.0023	mg/Kg		06/24/15 21:47	06/26/15 17:02	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-04

Lab Sample ID: 720-65322-30

Date Collected: 06/03/15 15:10
Matrix: Solid
Date Received: 06/08/15 15:30

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.37	J	0.39	0.065	mg/Kg		06/23/15 22:42	06/25/15 21:55	1
Arsenic	4.9		3.1	0.27	mg/Kg		06/23/15 22:42	06/24/15 20:03	4
Barium	120		1.6	0.22	mg/Kg		06/23/15 22:42	06/24/15 20:03	4
Beryllium	0.19		0.079	0.026	mg/Kg		06/23/15 22:42	06/25/15 21:55	1
Cadmium	0.13		0.098	0.0098	mg/Kg		06/23/15 22:42	06/25/15 21:55	1
Chromium	6.6		1.6	0.17	mg/Kg		06/23/15 22:42	06/24/15 20:03	4
Cobalt	4.8		0.63	0.063	mg/Kg		06/23/15 22:42	06/24/15 20:03	4
Copper	10		4.7	2.2	mg/Kg		06/23/15 22:42	06/24/15 20:03	4
Lead	9.1		1.6	0.33	mg/Kg		06/23/15 22:42	06/24/15 20:03	4
Molybdenum	0.47		0.39	0.050	mg/Kg		06/23/15 22:42	06/25/15 21:55	1
Nickel	15		1.6	0.16	mg/Kg		06/23/15 22:42	06/24/15 20:03	4
Selenium	ND		0.79	0.12	mg/Kg		06/23/15 22:42	06/25/15 21:55	1
Silver	ND		0.20	0.040	mg/Kg		06/23/15 22:42	06/25/15 21:55	1
Thallium	ND		0.39	0.11	mg/Kg		06/23/15 22:42	06/25/15 21:55	1
Vanadium	21		1.6	0.21	mg/Kg		06/23/15 22:42	06/24/15 20:03	4
Zinc	36		4.7	2.0	mg/Kg		06/23/15 22:42	06/24/15 20:03	4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.21	B	0.0088	0.0022	mg/Kg		06/24/15 21:47	06/26/15 17:40	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-05

Lab Sample ID: 720-65322-31

Date Collected: 06/03/15 15:25
Matrix: Solid
Date Received: 06/08/15 15:30

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.12	J F1	0.48	0.080	mg/Kg		06/24/15 20:17	06/26/15 21:43	1
Arsenic	5.1		3.8	0.33	mg/Kg		06/24/15 20:17	06/26/15 01:23	4
Barium	80		1.9	0.27	mg/Kg		06/24/15 20:17	06/26/15 01:23	4
Beryllium	ND	F1	0.096	0.031	mg/Kg		06/24/15 20:17	06/26/15 21:43	1
Cadmium	0.049	J	0.12	0.012	mg/Kg		06/24/15 20:17	06/26/15 21:43	1
Chromium	7.3		1.9	0.20	mg/Kg		06/24/15 20:17	06/26/15 01:23	4
Cobalt	3.5		0.77	0.077	mg/Kg		06/24/15 20:17	06/26/15 01:23	4
Copper	5.8		5.8	2.7	mg/Kg		06/24/15 20:17	06/26/15 01:23	4
Lead	8.9		1.9	0.40	mg/Kg		06/24/15 20:17	06/26/15 01:23	4
Molybdenum	0.61	F1	0.48	0.062	mg/Kg		06/24/15 20:17	06/26/15 21:43	1
Nickel	11		1.9	0.20	mg/Kg		06/24/15 20:17	06/26/15 01:23	4
Selenium	0.73	J B	0.96	0.14	mg/Kg		06/24/15 20:17	06/26/15 21:43	1
Silver	0.18	J F1	0.24	0.049	mg/Kg		06/24/15 20:17	06/26/15 21:43	1
Thallium	ND		0.48	0.14	mg/Kg		06/24/15 20:17	06/26/15 21:43	1
Vanadium	22		1.9	0.26	mg/Kg		06/24/15 20:17	06/26/15 01:23	4
Zinc	23		1.4	0.61	mg/Kg		06/24/15 20:17	06/26/15 21:43	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	1.4	B	0.085	0.021	mg/Kg		06/24/15 21:47	06/26/15 17:06	10

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-06

Lab Sample ID: 720-65322-32

Date Collected: 06/03/15 15:35
Matrix: Solid
Date Received: 06/08/15 15:30

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.45	0.074	mg/Kg		06/24/15 20:17	06/26/15 21:47	1
Arsenic	**3.9**		3.6	0.30	mg/Kg		06/24/15 20:17	06/26/15 01:28	4
Barium	**92**		1.8	0.25	mg/Kg		06/24/15 20:17	06/26/15 01:28	4
Beryllium	ND		0.089	0.029	mg/Kg		06/24/15 20:17	06/26/15 21:47	1
Cadmium	ND		0.11	0.011	mg/Kg		06/24/15 20:17	06/26/15 21:47	1
Chromium	**6.1**		1.8	0.19	mg/Kg		06/24/15 20:17	06/26/15 01:28	4
Cobalt	**2.5**		0.71	0.071	mg/Kg		06/24/15 20:17	06/26/15 01:28	4
Copper	**3.8**		1.3	0.64	mg/Kg		06/24/15 20:17	06/26/15 21:47	1
Lead	**6.1**		1.8	0.38	mg/Kg		06/24/15 20:17	06/26/15 01:28	4
Molybdenum	**0.52**		0.45	0.057	mg/Kg		06/24/15 20:17	06/26/15 21:47	1
Nickel	**7.2**		1.8	0.18	mg/Kg		06/24/15 20:17	06/26/15 01:28	4
Selenium	**0.72**	**J B**	0.89	0.13	mg/Kg		06/24/15 20:17	06/26/15 21:47	1
Silver	**0.10**	**J**	0.22	0.045	mg/Kg		06/24/15 20:17	06/26/15 21:47	1
Thallium	ND		0.45	0.13	mg/Kg		06/24/15 20:17	06/26/15 21:47	1
Vanadium	**23**		1.8	0.24	mg/Kg		06/24/15 20:17	06/26/15 01:28	4
Zinc	**19**		1.3	0.57	mg/Kg		06/24/15 20:17	06/26/15 21:47	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.39**	**B**	0.0086	0.0021	mg/Kg		06/24/15 21:47	06/26/15 17:09	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-07

Lab Sample ID: 720-65322-33

Date Collected: 06/03/15 15:40
Matrix: Solid
Date Received: 06/08/15 15:30

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.22	J	0.41	0.068	mg/Kg		06/24/15 20:17	06/26/15 21:52	1
Arsenic	9.0		3.3	0.28	mg/Kg		06/24/15 20:17	06/26/15 01:33	4
Barium	180		1.6	0.23	mg/Kg		06/24/15 20:17	06/26/15 01:33	4
Beryllium	ND		0.082	0.027	mg/Kg		06/24/15 20:17	06/26/15 21:52	1
Cadmium	0.10		0.10	0.010	mg/Kg		06/24/15 20:17	06/26/15 21:52	1
Chromium	6.8		1.6	0.17	mg/Kg		06/24/15 20:17	06/26/15 01:33	4
Cobalt	4.2		0.66	0.066	mg/Kg		06/24/15 20:17	06/26/15 01:33	4
Copper	12		4.9	2.3	mg/Kg		06/24/15 20:17	06/26/15 01:33	4
Lead	39		1.6	0.34	mg/Kg		06/24/15 20:17	06/26/15 01:33	4
Molybdenum	0.50		0.41	0.052	mg/Kg		06/24/15 20:17	06/26/15 21:52	1
Nickel	19		1.6	0.17	mg/Kg		06/24/15 20:17	06/26/15 01:33	4
Selenium	0.67	J B	0.82	0.12	mg/Kg		06/24/15 20:17	06/26/15 21:52	1
Silver	0.35		0.20	0.041	mg/Kg		06/24/15 20:17	06/26/15 21:52	1
Thallium	ND		0.41	0.12	mg/Kg		06/24/15 20:17	06/26/15 21:52	1
Vanadium	21		1.6	0.22	mg/Kg		06/24/15 20:17	06/26/15 01:33	4
Zinc	58		1.2	0.52	mg/Kg		06/24/15 20:17	06/26/15 21:52	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.24	B	0.0097	0.0024	mg/Kg		06/24/15 21:47	06/26/15 17:11	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-08

Lab Sample ID: 720-65322-34

Date Collected: 06/03/15 16:00
Matrix: Solid
Date Received: 06/08/15 15:30

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.077	J	0.40	0.067	mg/Kg		06/24/15 20:17	06/26/15 21:57	1
Arsenic	12		3.2	0.27	mg/Kg		06/24/15 20:17	06/26/15 01:38	4
Barium	240		1.6	0.23	mg/Kg		06/24/15 20:17	06/26/15 01:38	4
Beryllium	ND		0.081	0.026	mg/Kg		06/24/15 20:17	06/26/15 21:57	1
Cadmium	0.058	J	0.10	0.010	mg/Kg		06/24/15 20:17	06/26/15 21:57	1
Chromium	9.0		1.6	0.17	mg/Kg		06/24/15 20:17	06/26/15 01:38	4
Cobalt	5.4		0.65	0.065	mg/Kg		06/24/15 20:17	06/26/15 01:38	4
Copper	9.9		4.8	2.3	mg/Kg		06/24/15 20:17	06/26/15 01:38	4
Lead	9.5		1.6	0.34	mg/Kg		06/24/15 20:17	06/26/15 01:38	4
Molybdenum	0.48		0.40	0.052	mg/Kg		06/24/15 20:17	06/26/15 21:57	1
Nickel	18		1.6	0.16	mg/Kg		06/24/15 20:17	06/26/15 01:38	4
Selenium	0.75	J B	0.81	0.12	mg/Kg		06/24/15 20:17	06/26/15 21:57	1
Silver	0.33		0.20	0.041	mg/Kg		06/24/15 20:17	06/26/15 21:57	1
Thallium	ND		0.40	0.12	mg/Kg		06/24/15 20:17	06/26/15 21:57	1
Vanadium	30		1.6	0.22	mg/Kg		06/24/15 20:17	06/26/15 01:38	4
Zinc	32		1.2	0.51	mg/Kg		06/24/15 20:17	06/26/15 21:57	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.62	B	0.0092	0.0023	mg/Kg		06/24/15 21:47	06/26/15 17:13	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-09

Lab Sample ID: 720-65322-35

Date Collected: 06/03/15 16:15
Matrix: Solid
Date Received: 06/08/15 15:30

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.084	J	0.46	0.077	mg/Kg		06/24/15 20:17	06/26/15 22:01	1
Arsenic	11		3.7	0.31	mg/Kg		06/24/15 20:17	06/26/15 01:43	4
Barium	150		1.9	0.26	mg/Kg		06/24/15 20:17	06/26/15 01:43	4
Beryllium	ND		0.093	0.030	mg/Kg		06/24/15 20:17	06/26/15 22:01	1
Cadmium	0.051	J	0.12	0.011	mg/Kg		06/24/15 20:17	06/26/15 22:01	1
Chromium	3.9		1.9	0.20	mg/Kg		06/24/15 20:17	06/26/15 01:43	4
Cobalt	2.9		0.74	0.074	mg/Kg		06/24/15 20:17	06/26/15 01:43	4
Copper	5.4		1.4	0.66	mg/Kg		06/24/15 20:17	06/26/15 22:01	1
Lead	6.5		1.9	0.39	mg/Kg		06/24/15 20:17	06/26/15 01:43	4
Molybdenum	0.46		0.46	0.059	mg/Kg		06/24/15 20:17	06/26/15 22:01	1
Nickel	6.1		1.9	0.19	mg/Kg		06/24/15 20:17	06/26/15 01:43	4
Selenium	0.51	J B	0.93	0.14	mg/Kg		06/24/15 20:17	06/26/15 22:01	1
Silver	0.37		0.23	0.047	mg/Kg		06/24/15 20:17	06/26/15 22:01	1
Thallium	ND		0.46	0.13	mg/Kg		06/24/15 20:17	06/26/15 22:01	1
Vanadium	21		1.9	0.25	mg/Kg		06/24/15 20:17	06/26/15 01:43	4
Zinc	21		1.4	0.59	mg/Kg		06/24/15 20:17	06/26/15 22:01	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.32	B	0.0086	0.0021	mg/Kg		06/24/15 21:47	06/26/15 17:16	1

Client Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-10

Lab Sample ID: 720-65322-36

Date Collected: 06/03/15 16:25
Matrix: Solid
Date Received: 06/08/15 15:30

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.11	J	0.38	0.063	mg/Kg		06/24/15 20:17	06/26/15 22:06	1
Arsenic	25		3.1	0.26	mg/Kg		06/24/15 20:17	06/26/15 01:48	4
Barium	230		1.5	0.22	mg/Kg		06/24/15 20:17	06/26/15 01:48	4
Beryllium	ND		0.076	0.025	mg/Kg		06/24/15 20:17	06/26/15 22:06	1
Cadmium	0.071	J	0.095	0.0095	mg/Kg		06/24/15 20:17	06/26/15 22:06	1
Chromium	5.0		1.5	0.16	mg/Kg		06/24/15 20:17	06/26/15 01:48	4
Cobalt	3.2		0.61	0.061	mg/Kg		06/24/15 20:17	06/26/15 01:48	4
Copper	7.3		4.6	2.2	mg/Kg		06/24/15 20:17	06/26/15 01:48	4
Lead	10		1.5	0.32	mg/Kg		06/24/15 20:17	06/26/15 01:48	4
Molybdenum	0.52		0.38	0.049	mg/Kg		06/24/15 20:17	06/26/15 22:06	1
Nickel	7.4		1.5	0.16	mg/Kg		06/24/15 20:17	06/26/15 01:48	4
Selenium	0.39	J B	0.76	0.11	mg/Kg		06/24/15 20:17	06/26/15 22:06	1
Silver	0.44		0.19	0.039	mg/Kg		06/24/15 20:17	06/26/15 22:06	1
Thallium	ND		0.38	0.11	mg/Kg		06/24/15 20:17	06/26/15 22:06	1
Vanadium	25		1.5	0.21	mg/Kg		06/24/15 20:17	06/26/15 01:48	4
Zinc	28		1.1	0.48	mg/Kg		06/24/15 20:17	06/26/15 22:06	1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	3.2	B	0.88	0.22	mg/Kg		06/24/15 21:47	06/26/15 16:15	100

QC Sample Results

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 720-184137/1-A
Matrix: Solid
Analysis Batch: 184207

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 184137

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.50	0.083	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Arsenic	ND		1.0	0.085	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Barium	ND		0.50	0.071	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Beryllium	ND		0.10	0.033	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Cadmium	ND		0.13	0.012	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Chromium	ND		0.50	0.053	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Cobalt	ND		0.20	0.020	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Copper	ND		1.5	0.71	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Lead	ND		0.50	0.11	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Molybdenum	ND		0.50	0.064	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Nickel	ND		0.50	0.051	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Selenium	ND		1.0	0.15	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Silver	ND		0.25	0.051	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Thallium	ND		0.50	0.15	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Vanadium	ND		0.50	0.068	mg/Kg		06/23/15 22:42	06/24/15 17:48	1
Zinc	ND		1.5	0.64	mg/Kg		06/23/15 22:42	06/24/15 17:48	1

Lab Sample ID: LCS 720-184137/2-A
Matrix: Solid
Analysis Batch: 184215

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 184137

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	50.0	47.8		mg/Kg		96	80 - 120
Arsenic	50.0	48.2		mg/Kg		96	80 - 120
Barium	50.0	51.7		mg/Kg		103	80 - 120
Beryllium	50.0	48.7		mg/Kg		97	80 - 120
Cadmium	50.0	48.9		mg/Kg		98	80 - 120
Chromium	50.0	49.9		mg/Kg		100	80 - 120
Cobalt	50.0	50.9		mg/Kg		102	80 - 120
Copper	50.0	50.5		mg/Kg		101	80 - 120
Lead	50.0	50.6		mg/Kg		101	80 - 120
Molybdenum	50.0	51.2		mg/Kg		102	80 - 120
Nickel	50.0	51.2		mg/Kg		102	80 - 120
Selenium	50.0	47.4		mg/Kg		95	80 - 120
Silver	25.0	24.0		mg/Kg		96	80 - 120
Thallium	50.0	50.7		mg/Kg		101	80 - 120
Vanadium	50.0	48.6		mg/Kg		97	80 - 120
Zinc	50.0	48.8		mg/Kg		98	80 - 120

Lab Sample ID: LCSD 720-184137/3-A
Matrix: Solid
Analysis Batch: 184207

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 184137

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	50.0	51.4		mg/Kg		103	80 - 120	0	20
Arsenic	50.0	52.3		mg/Kg		105	80 - 120	0	20
Barium	50.0	52.4		mg/Kg		105	80 - 120	18	20
Beryllium	50.0	51.4		mg/Kg		103	80 - 120	18	20

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCSD 720-184137/3-A
Matrix: Solid
Analysis Batch: 184207

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 184137

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cadmium	50.0	51.8		mg/Kg		104	80 - 120	1	20
Chromium	50.0	52.1		mg/Kg		104	80 - 120	1	20
Cobalt	50.0	54.1		mg/Kg		108	80 - 120	1	20
Copper	50.0	52.6		mg/Kg		105	80 - 120	1	20
Lead	50.0	52.3		mg/Kg		105	80 - 120	0	20
Molybdenum	50.0	53.4		mg/Kg		107	80 - 120	0	20
Nickel	50.0	52.4		mg/Kg		105	80 - 120	0	20
Selenium	50.0	49.8		mg/Kg		100	80 - 120	1	20
Silver	25.0	26.1		mg/Kg		104	80 - 120	0	20
Thallium	50.0	52.8		mg/Kg		106	80 - 120	0	20
Vanadium	50.0	52.7		mg/Kg		105	80 - 120	1	20
Zinc	50.0	51.7		mg/Kg		103	80 - 120	1	20

Lab Sample ID: LCSSRM 720-184137/25-A
Matrix: Solid
Analysis Batch: 184207

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 184137

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	74.6	40.0		mg/Kg		54	11 - 101
Arsenic	45.5	45.1		mg/Kg		99	69 - 119
Barium	579	530		mg/Kg		92	61 - 117
Beryllium	155	147		mg/Kg		95	56 - 102
Cadmium	201	190		mg/Kg		94	67 - 118
Chromium	106	103		mg/Kg		97	67 - 121
Cobalt	247	242		mg/Kg		98	64 - 133
Copper	130	129		mg/Kg		99	68 - 126
Lead	302	276		mg/Kg		91	62 - 113
Molybdenum	165	155		mg/Kg		94	62 - 128
Nickel	305	287		mg/Kg		94	65 - 117
Selenium	133	129		mg/Kg		97	63 - 126
Silver	33.5	32.7		mg/Kg		98	51 - 130
Thallium	191	176		mg/Kg		92	64 - 124
Vanadium	214	216		mg/Kg		101	67 - 123
Zinc	388	361		mg/Kg		93	62 - 110

Lab Sample ID: MB 720-184205/1-A
Matrix: Solid
Analysis Batch: 184297

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 184205

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.50	0.083	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Arsenic	ND		1.0	0.085	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Barium	ND		0.50	0.071	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Beryllium	ND		0.10	0.033	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Cadmium	ND		0.13	0.012	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Chromium	ND		0.50	0.053	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Cobalt	ND		0.20	0.020	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Copper	ND		1.5	0.71	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Lead	ND		0.50	0.11	mg/Kg		06/24/15 20:17	06/26/15 00:38	1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: MB 720-184205/1-A
Matrix: Solid
Analysis Batch: 184297

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 184205

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Molybdenum	ND		0.50	0.064	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Nickel	ND		0.50	0.051	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Selenium	ND		1.0	0.15	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Silver	ND		0.25	0.051	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Thallium	ND		0.50	0.15	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Vanadium	ND		0.50	0.068	mg/Kg		06/24/15 20:17	06/26/15 00:38	1
Zinc	ND		1.5	0.64	mg/Kg		06/24/15 20:17	06/26/15 00:38	1

Lab Sample ID: LCS 720-184205/2-A
Matrix: Solid
Analysis Batch: 184297

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 184205

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	50.0	50.3		mg/Kg		101	80 - 120
Arsenic	50.0	49.3		mg/Kg		99	80 - 120
Barium	50.0	52.7		mg/Kg		105	80 - 120
Beryllium	50.0	49.7		mg/Kg		99	80 - 120
Cadmium	50.0	47.1		mg/Kg		94	80 - 120
Chromium	50.0	48.7		mg/Kg		97	80 - 120
Cobalt	50.0	48.1		mg/Kg		96	80 - 120
Copper	50.0	48.9		mg/Kg		98	80 - 120
Lead	50.0	50.6		mg/Kg		101	80 - 120
Molybdenum	50.0	50.7		mg/Kg		101	80 - 120
Nickel	50.0	49.1		mg/Kg		98	80 - 120
Selenium	50.0	47.1		mg/Kg		94	80 - 120
Silver	25.0	22.8		mg/Kg		91	80 - 120
Thallium	50.0	50.4		mg/Kg		101	80 - 120
Vanadium	50.0	50.1		mg/Kg		100	80 - 120
Zinc	50.0	45.6		mg/Kg		91	80 - 120

Lab Sample ID: LCSD 720-184205/3-A
Matrix: Solid
Analysis Batch: 184297

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 184205

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	50.0	51.3		mg/Kg		103	80 - 120	2	20
Arsenic	50.0	50.2		mg/Kg		100	80 - 120	2	20
Barium	50.0	53.3		mg/Kg		107	80 - 120	1	20
Beryllium	50.0	50.4		mg/Kg		101	80 - 120	1	20
Cadmium	50.0	47.8		mg/Kg		96	80 - 120	1	20
Chromium	50.0	49.2		mg/Kg		98	80 - 120	1	20
Cobalt	50.0	48.7		mg/Kg		97	80 - 120	1	20
Copper	50.0	49.6		mg/Kg		99	80 - 120	1	20
Lead	50.0	51.4		mg/Kg		103	80 - 120	1	20
Molybdenum	50.0	51.3		mg/Kg		103	80 - 120	1	20
Nickel	50.0	49.7		mg/Kg		99	80 - 120	1	20
Selenium	50.0	48.1		mg/Kg		96	80 - 120	2	20
Silver	25.0	23.1		mg/Kg		92	80 - 120	1	20
Thallium	50.0	51.0		mg/Kg		102	80 - 120	1	20

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCSD 720-184205/3-A
Matrix: Solid
Analysis Batch: 184297

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 184205

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vanadium	50.0	50.6		mg/Kg		101	80 - 120	1	20
Zinc	50.0	46.2		mg/Kg		92	80 - 120	1	20

Lab Sample ID: LCSSRM 720-184205/24-A
Matrix: Solid
Analysis Batch: 184297

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 184205

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	74.6	45.0		mg/Kg		60	11 - 101
Arsenic	45.5	41.7		mg/Kg		92	69 - 119
Barium	579	503		mg/Kg		87	61 - 117
Beryllium	155	143		mg/Kg		92	56 - 102
Cadmium	201	171		mg/Kg		85	67 - 118
Chromium	106	92.1		mg/Kg		87	67 - 121
Cobalt	247	211		mg/Kg		85	64 - 133
Copper	130	118		mg/Kg		91	68 - 126
Lead	302	267		mg/Kg		88	62 - 113
Molybdenum	165	148		mg/Kg		90	62 - 128
Nickel	305	266		mg/Kg		87	65 - 117
Selenium	133	121	B	mg/Kg		91	63 - 126
Silver	33.5	28.2		mg/Kg		84	51 - 130
Thallium	191	169		mg/Kg		88	64 - 124
Vanadium	214	196		mg/Kg		92	67 - 123

Lab Sample ID: LCSSRM 720-184205/24-A
Matrix: Solid
Analysis Batch: 184384

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 184205

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Zinc	388	360		mg/Kg		93	62 - 110

Lab Sample ID: 720-65322-31 MS
Matrix: Solid
Analysis Batch: 184297

Client Sample ID: MM-BG-05
Prep Type: Total/NA
Prep Batch: 184205

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND	F1	46.3	25.9	F1	mg/Kg		56	75 - 125
Arsenic	5.1		46.3	54.6		mg/Kg		107	75 - 125
Barium	80		46.3	137		mg/Kg		123	75 - 125
Beryllium	0.21	J	46.3	51.1		mg/Kg		110	75 - 125
Cadmium	0.089	J	46.3	47.0		mg/Kg		101	75 - 125
Chromium	7.3		46.3	56.9		mg/Kg		107	75 - 125
Cobalt	3.5		46.3	51.3		mg/Kg		103	75 - 125
Copper	5.8		46.3	56.9		mg/Kg		110	75 - 125
Lead	8.9		46.3	58.5		mg/Kg		107	75 - 125
Molybdenum	0.57	J	46.3	50.6		mg/Kg		108	75 - 125
Nickel	11		46.3	59.6		mg/Kg		106	75 - 125
Selenium	ND		46.3	49.3	B	mg/Kg		106	75 - 125
Silver	ND		23.1	23.2		mg/Kg		100	75 - 125

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: 720-65322-31 MS — **Client Sample ID: MM-BG-05**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 184297 — **Prep Batch: 184205**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Thallium	ND		46.3	49.1		mg/Kg		106	75 - 125
Vanadium	22		46.3	76.1		mg/Kg		117	75 - 125

Lab Sample ID: 720-65322-31 MS — **Client Sample ID: MM-BG-05**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 184384 — **Prep Batch: 184205**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Zinc	23		46.3	80.6		mg/Kg		125	75 - 125

Lab Sample ID: 720-65322-31 MSD — **Client Sample ID: MM-BG-05**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 184297 — **Prep Batch: 184205**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND	F1	49.0	26.2	F1	mg/Kg		53	75 - 125	1	20
Arsenic	5.1		49.0	52.6		mg/Kg		97	75 - 125	4	20
Barium	80		49.0	134		mg/Kg		109	75 - 125	3	20
Beryllium	0.21	J	49.0	49.9		mg/Kg		101	75 - 125	2	20
Cadmium	0.089	J	49.0	45.4		mg/Kg		92	75 - 125	4	20
Chromium	7.3		49.0	54.8		mg/Kg		97	75 - 125	4	20
Cobalt	3.5		49.0	49.4		mg/Kg		94	75 - 125	4	20
Copper	5.8		49.0	55.2		mg/Kg		101	75 - 125	3	20
Lead	8.9		49.0	57.9		mg/Kg		100	75 - 125	1	20
Molybdenum	0.57	J	49.0	48.2		mg/Kg		97	75 - 125	5	20
Nickel	11		49.0	56.6		mg/Kg		94	75 - 125	5	20
Selenium	ND		49.0	46.6	B	mg/Kg		95	75 - 125	6	20
Silver	ND		24.5	22.3		mg/Kg		91	75 - 125	4	20
Thallium	ND		49.0	47.8		mg/Kg		98	75 - 125	3	20
Vanadium	22		49.0	69.2		mg/Kg		96	75 - 125	9	20

Lab Sample ID: 720-65322-31 MSD — **Client Sample ID: MM-BG-05**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 184384 — **Prep Batch: 184205**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Zinc	23		49.0	78.1		mg/Kg		113	75 - 125	3	20

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 720-184214/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 184337 — **Prep Batch: 184214**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.00300	J	0.010	0.0025	mg/Kg		06/24/15 21:47	06/26/15 15:39	1

Method: 7471A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 720-184214/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 184337 — **Prep Batch: 184214**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Mercury			0.833	0.799		mg/Kg		96	80 - 120		

Lab Sample ID: LCSD 720-184214/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 184337 — **Prep Batch: 184214**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury			0.833	0.813		mg/Kg		98	80 - 120	2	20

Lab Sample ID: 720-65322-28 MS — **Client Sample ID: MM-BG-02**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 184337 — **Prep Batch: 184214**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Mercury	0.17	F1 B	0.806	1.15		mg/Kg		122	75 - 125		

Lab Sample ID: 720-65322-28 MSD — **Client Sample ID: MM-BG-02**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 184337 — **Prep Batch: 184214**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.17	F1 B	0.735	1.10	F1	mg/Kg		127	75 - 125	4	20

QC Association Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Metals

Prep Batch: 184137

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-28	MM-BG-02	Total/NA	Solid	3050B	
720-65322-29	MM-BG-03	Total/NA	Solid	3050B	
720-65322-30	MM-BG-04	Total/NA	Solid	3050B	
LCS 720-184137/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 720-184137/3-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
LCSSRM 720-184137/25-A	Lab Control Sample	Total/NA	Solid	3050B	
MB 720-184137/1-A	Method Blank	Total/NA	Solid	3050B	

Prep Batch: 184205

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-31	MM-BG-05	Total/NA	Solid	3050B	
720-65322-31 MS	MM-BG-05	Total/NA	Solid	3050B	
720-65322-31 MSD	MM-BG-05	Total/NA	Solid	3050B	
720-65322-32	MM-BG-06	Total/NA	Solid	3050B	
720-65322-33	MM-BG-07	Total/NA	Solid	3050B	
720-65322-34	MM-BG-08	Total/NA	Solid	3050B	
720-65322-35	MM-BG-09	Total/NA	Solid	3050B	
720-65322-36	MM-BG-10	Total/NA	Solid	3050B	
LCS 720-184205/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 720-184205/3-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
LCSSRM 720-184205/24-A	Lab Control Sample	Total/NA	Solid	3050B	
MB 720-184205/1-A	Method Blank	Total/NA	Solid	3050B	

Analysis Batch: 184207

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-28	MM-BG-02	Total/NA	Solid	6010B	184137
720-65322-29	MM-BG-03	Total/NA	Solid	6010B	184137
720-65322-30	MM-BG-04	Total/NA	Solid	6010B	184137
LCSD 720-184137/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	184137
LCSSRM 720-184137/25-A	Lab Control Sample	Total/NA	Solid	6010B	184137
MB 720-184137/1-A	Method Blank	Total/NA	Solid	6010B	184137

Prep Batch: 184214

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-28	MM-BG-02	Total/NA	Solid	7471A	
720-65322-28 MS	MM-BG-02	Total/NA	Solid	7471A	
720-65322-28 MSD	MM-BG-02	Total/NA	Solid	7471A	
720-65322-29	MM-BG-03	Total/NA	Solid	7471A	
720-65322-30	MM-BG-04	Total/NA	Solid	7471A	
720-65322-31	MM-BG-05	Total/NA	Solid	7471A	
720-65322-32	MM-BG-06	Total/NA	Solid	7471A	
720-65322-33	MM-BG-07	Total/NA	Solid	7471A	
720-65322-34	MM-BG-08	Total/NA	Solid	7471A	
720-65322-35	MM-BG-09	Total/NA	Solid	7471A	
720-65322-36	MM-BG-10	Total/NA	Solid	7471A	
LCS 720-184214/2-A	Lab Control Sample	Total/NA	Solid	7471A	
LCSD 720-184214/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	
MB 720-184214/1-A	Method Blank	Total/NA	Solid	7471A	

Metals (Continued)

Analysis Batch: 184215

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 720-184137/2-A	Lab Control Sample	Total/NA	Solid	6010B	184137

Analysis Batch: 184284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-28	MM-BG-02	Total/NA	Solid	6010B	184137
720-65322-29	MM-BG-03	Total/NA	Solid	6010B	184137
720-65322-30	MM-BG-04	Total/NA	Solid	6010B	184137

Analysis Batch: 184297

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-31	MM-BG-05	Total/NA	Solid	6010B	184205
720-65322-31 MS	MM-BG-05	Total/NA	Solid	6010B	184205
720-65322-31 MSD	MM-BG-05	Total/NA	Solid	6010B	184205
720-65322-32	MM-BG-06	Total/NA	Solid	6010B	184205
720-65322-33	MM-BG-07	Total/NA	Solid	6010B	184205
720-65322-34	MM-BG-08	Total/NA	Solid	6010B	184205
720-65322-35	MM-BG-09	Total/NA	Solid	6010B	184205
720-65322-36	MM-BG-10	Total/NA	Solid	6010B	184205
LCS 720-184205/2-A	Lab Control Sample	Total/NA	Solid	6010B	184205
LCSD 720-184205/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	184205
LCSSRM 720-184205/24-A	Lab Control Sample	Total/NA	Solid	6010B	184205
MB 720-184205/1-A	Method Blank	Total/NA	Solid	6010B	184205

Analysis Batch: 184337

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-28	MM-BG-02	Total/NA	Solid	7471A	184214
720-65322-28 MS	MM-BG-02	Total/NA	Solid	7471A	184214
720-65322-28 MSD	MM-BG-02	Total/NA	Solid	7471A	184214
720-65322-29	MM-BG-03	Total/NA	Solid	7471A	184214
720-65322-30	MM-BG-04	Total/NA	Solid	7471A	184214
720-65322-31	MM-BG-05	Total/NA	Solid	7471A	184214
720-65322-32	MM-BG-06	Total/NA	Solid	7471A	184214
720-65322-33	MM-BG-07	Total/NA	Solid	7471A	184214
720-65322-34	MM-BG-08	Total/NA	Solid	7471A	184214
720-65322-35	MM-BG-09	Total/NA	Solid	7471A	184214
720-65322-36	MM-BG-10	Total/NA	Solid	7471A	184214
LCS 720-184214/2-A	Lab Control Sample	Total/NA	Solid	7471A	184214
LCSD 720-184214/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	184214
MB 720-184214/1-A	Method Blank	Total/NA	Solid	7471A	184214

Analysis Batch: 184384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-65322-31	MM-BG-05	Total/NA	Solid	6010B	184205
720-65322-31 MS	MM-BG-05	Total/NA	Solid	6010B	184205
720-65322-31 MSD	MM-BG-05	Total/NA	Solid	6010B	184205
720-65322-32	MM-BG-06	Total/NA	Solid	6010B	184205
720-65322-33	MM-BG-07	Total/NA	Solid	6010B	184205
720-65322-34	MM-BG-08	Total/NA	Solid	6010B	184205
720-65322-35	MM-BG-09	Total/NA	Solid	6010B	184205
720-65322-36	MM-BG-10	Total/NA	Solid	6010B	184205
LCSSRM 720-184205/24-A	Lab Control Sample	Total/NA	Solid	6010B	184205

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-02 — Lab Sample ID: 720-65322-28

Date Collected: 06/03/15 14:50 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			184137	06/23/15 22:42	CTD	TAL PLS
Total/NA	Analysis	6010B		4	184207	06/24/15 19:53	SLK	TAL PLS
Total/NA	Prep	3050B			184137	06/23/15 22:42	CTD	TAL PLS
Total/NA	Analysis	6010B		1	184284	06/25/15 21:45	SLK	TAL PLS
Total/NA	Prep	7471A			184214	06/24/15 21:47	ECT	TAL PLS
Total/NA	Analysis	7471A		1	184337	06/26/15 16:59	SLK	TAL PLS

Client Sample ID: MM-BG-03 — Lab Sample ID: 720-65322-29

Date Collected: 06/03/15 15:00 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			184137	06/23/15 22:42	CTD	TAL PLS
Total/NA	Analysis	6010B		4	184207	06/24/15 19:58	SLK	TAL PLS
Total/NA	Prep	3050B			184137	06/23/15 22:42	CTD	TAL PLS
Total/NA	Analysis	6010B		1	184284	06/25/15 21:50	SLK	TAL PLS
Total/NA	Prep	7471A			184214	06/24/15 21:47	ECT	TAL PLS
Total/NA	Analysis	7471A		1	184337	06/26/15 17:02	SLK	TAL PLS

Client Sample ID: MM-BG-04 — Lab Sample ID: 720-65322-30

Date Collected: 06/03/15 15:10 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			184137	06/23/15 22:42	CTD	TAL PLS
Total/NA	Analysis	6010B		4	184207	06/24/15 20:03	SLK	TAL PLS
Total/NA	Prep	3050B			184137	06/23/15 22:42	CTD	TAL PLS
Total/NA	Analysis	6010B		1	184284	06/25/15 21:55	SLK	TAL PLS
Total/NA	Prep	7471A			184214	06/24/15 21:47	ECT	TAL PLS
Total/NA	Analysis	7471A		1	184337	06/26/15 17:40	SLK	TAL PLS

Client Sample ID: MM-BG-05 — Lab Sample ID: 720-65322-31

Date Collected: 06/03/15 15:25 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			184205	06/24/15 20:17	CTD	TAL PLS
Total/NA	Analysis	6010B		1	184384	06/26/15 21:43	SLK	TAL PLS
Total/NA	Prep	3050B			184205	06/24/15 20:17	CTD	TAL PLS
Total/NA	Analysis	6010B		4	184297	06/26/15 01:23	SLK	TAL PLS
Total/NA	Prep	7471A			184214	06/24/15 21:47	ECT	TAL PLS
Total/NA	Analysis	7471A		10	184337	06/26/15 17:06	SLK	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-06 — Lab Sample ID: 720-65322-32

Date Collected: 06/03/15 15:35 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			184205	06/24/15 20:17	CTD	TAL PLS
Total/NA	Analysis	6010B		1	184384	06/26/15 21:47	SLK	TAL PLS
Total/NA	Prep	3050B			184205	06/24/15 20:17	CTD	TAL PLS
Total/NA	Analysis	6010B		4	184297	06/26/15 01:28	SLK	TAL PLS
Total/NA	Prep	7471A			184214	06/24/15 21:47	ECT	TAL PLS
Total/NA	Analysis	7471A		1	184337	06/26/15 17:09	SLK	TAL PLS

Client Sample ID: MM-BG-07 — Lab Sample ID: 720-65322-33

Date Collected: 06/03/15 15:40 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			184205	06/24/15 20:17	CTD	TAL PLS
Total/NA	Analysis	6010B		1	184384	06/26/15 21:52	SLK	TAL PLS
Total/NA	Prep	3050B			184205	06/24/15 20:17	CTD	TAL PLS
Total/NA	Analysis	6010B		4	184297	06/26/15 01:33	SLK	TAL PLS
Total/NA	Prep	7471A			184214	06/24/15 21:47	ECT	TAL PLS
Total/NA	Analysis	7471A		1	184337	06/26/15 17:11	SLK	TAL PLS

Client Sample ID: MM-BG-08 — Lab Sample ID: 720-65322-34

Date Collected: 06/03/15 16:00 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			184205	06/24/15 20:17	CTD	TAL PLS
Total/NA	Analysis	6010B		1	184384	06/26/15 21:57	SLK	TAL PLS
Total/NA	Prep	3050B			184205	06/24/15 20:17	CTD	TAL PLS
Total/NA	Analysis	6010B		4	184297	06/26/15 01:38	SLK	TAL PLS
Total/NA	Prep	7471A			184214	06/24/15 21:47	ECT	TAL PLS
Total/NA	Analysis	7471A		1	184337	06/26/15 17:13	SLK	TAL PLS

Client Sample ID: MM-BG-09 — Lab Sample ID: 720-65322-35

Date Collected: 06/03/15 16:15 — **Matrix: Solid**
Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			184205	06/24/15 20:17	CTD	TAL PLS
Total/NA	Analysis	6010B		1	184384	06/26/15 22:01	SLK	TAL PLS
Total/NA	Prep	3050B			184205	06/24/15 20:17	CTD	TAL PLS
Total/NA	Analysis	6010B		4	184297	06/26/15 01:43	SLK	TAL PLS
Total/NA	Prep	7471A			184214	06/24/15 21:47	ECT	TAL PLS
Total/NA	Analysis	7471A		1	184337	06/26/15 17:16	SLK	TAL PLS

Lab Chronicle

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Client Sample ID: MM-BG-10

Lab Sample ID: 720-65322-36

Date Collected: 06/03/15 16:25

Matrix: Solid

Date Received: 06/08/15 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			184205	06/24/15 20:17	CTD	TAL PLS
Total/NA	Analysis	6010B		1	184384	06/26/15 22:06	SLK	TAL PLS
Total/NA	Prep	3050B			184205	06/24/15 20:17	CTD	TAL PLS
Total/NA	Analysis	6010B		4	184297	06/26/15 01:48	SLK	TAL PLS
Total/NA	Prep	7471A			184214	06/24/15 21:47	ECT	TAL PLS
Total/NA	Analysis	7471A		100	184337	06/26/15 16:15	SLK	TAL PLS

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-16

Method Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL PLS
7471A	Mercury (CVAA)	SW846	TAL PLS

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: Engineering Remediation Resources Group.
Project/Site: Mammoth PA/SI

TestAmerica Job ID: 720-65322-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-65322-28	MM-BG-02	Solid	06/03/15 14:50	06/08/15 15:30
720-65322-29	MM-BG-03	Solid	06/03/15 15:00	06/08/15 15:30
720-65322-30	MM-BG-04	Solid	06/03/15 15:10	06/08/15 15:30
720-65322-31	MM-BG-05	Solid	06/03/15 15:25	06/08/15 15:30
720-65322-32	MM-BG-06	Solid	06/03/15 15:35	06/08/15 15:30
720-65322-33	MM-BG-07	Solid	06/03/15 15:40	06/08/15 15:30
720-65322-34	MM-BG-08	Solid	06/03/15 16:00	06/08/15 15:30
720-65322-35	MM-BG-09	Solid	06/03/15 16:15	06/08/15 15:30
720-65322-36	MM-BG-10	Solid	06/03/15 16:25	06/08/15 15:30

Sharma, Dimple 720-65322-2

From: Samantha Caruthers-Knight <samantha.caruthers-knight@errg.com>
Sent: Tuesday, June 23, 2015 1:30 PM
To: Sharma, Dimple
Subject: Additional Mammoth Samples

I'd like to run the samples that were held for the mammoth project. Can you please run them for metals as identified on the COC? Please also hold all the remaining soil for all samples until released. We may need to run additional analyses.

Thanks
Samantha

Samantha Caruthers-Knight P.G.
Project Geologist
Engineering/Remediation Resources Group, Inc

115 Sansome St, Suite 200
San Francisco CA, 94108
samantha.knight@errg.com

Main (925) 969-0750
Direct (415) 848-7100
Cell (510) 851-3279

720-65322 Chain of Custody

161662

ERRG

Engineering / Remediation Resources Group, Inc.
115 Sansome Street, Suite 200
San Francisco, CA 94104
Phone: (415) 395-9974
Fax: (415) 395-9983

720-65322

Lab No. _____
Address _____

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To):	California EDF Report? ☐ Yes ☐ No
Laboratory: TestAmerica	Electronic Deliverables To (Email Address): Samantha.Caruthers-Knight@errg.com
Phone No.: / Fax No.:	Sampler : SCKnight
Project Number: 2014-083 / Phase # / Task # 8.02	
Project Name: Mammoth Mill PA/SI	Project Address: Mammoth Lakes
Project Manager: Samantha Caruthers-Knight	

Sample Designation	Sampling Date	Sampling Time	Container 8 oz Jar	Matrix Soil	Matrix Water	Cam 17 Metals	Paste pH	Hold	12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
MM-SD-04	6/2/15	1410	2	X		X	X		std	2		
MM-SD-05	6/2/15	1425	2	X		X	X		std	2		
MM-SD-06	6/2/15	1435	2	X		X	X		std	2		
MM-SD-07	6/2/15	1445	2	X		X	X		std	2		
MM-SD-08	6/2/15	1455	2	X		X	X		std	2		
MM-S-16	6/3/15	940	2	X		X	X		std	2		
MM-S-17	6/3/15	950	2	X		X	X		std	2		
MM-S-18	6/3/15	1000	2	X		X	X		std	2		
MM-S-19	6/3/15	1010	2	X		X	X		std	2		
MM-S-20	6/3/15	1025	2	X		X	X		std	2		

Relinquished by:	Date	Time	Received by:
[signature]	6/6/15	1250	[signature]
[signature]	6-8-15	1530	[signature]

Remarks:
6/3/15 CPT
2c/1.5c

Bill to: Engineering / Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, CA 94553

720-65322 Chain of Custody

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ERRG

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115 Sansome Street, Suite 200
San Francisco, CA 94104
Phone: (415) 395-9974
Fax: (415) 395-9983

720-65322

Lab No.
Address

6/29/2015

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To):	California EDF Report? ☐ Yes ☐ No
Laboratory: TestAmerica	Electronic Deliverables To (Email Address): Samantha.Caruthers-Knight@errg.com
Phone No.: / Fax No.:	Sampler : SCKnight
Project Number: 2014-083 / Phase # / Task # 8.02	
Project Name: Mammoth Mill PA/SI	Project Address: Mammoth Lakes
Project Manager: Samantha Caruthers-Knight	

Sample Designation	Sampling Date	Sampling Time	Container 8 oz Jar	Matrix Soil	Matrix Water	Cam 17 Metals	Paste pH	Hold	12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
MM-S-21	6/3/15	1035	2	X		X	X		std	2		
MM-S-22	6/3/15	1100	2	X		X	X		std	2		
MM-S-23	6/3/15	1105	2	X		X	X		std	2		
MM-S-24	6/3/15	1115	2	X		X	X		std	2		
MM-S-25	6/3/15	1125	2	X		X	X		std	2		
MM-S-26	6/3/15	1135	2	X		X	X		std	2		
MM-S-27	6/3/15	1145	2	X		X	X		std	2		
MM-S-28	6/3/15	1205	2	X		X	X		std	2		
MM-S-29	6/3/15	1215	2	X		X	X		std	2		
MM-S-30	6/3/15	1220	2	X		X	X		std	2		

Relinquished by:	Date	Time	Received by:
[signature]	6/15/15	1450	[signature]
Relinquished by: [signature]	6-8-15	1530	Received by: [signature]
Relinquished by:	Date	Time	Received by Laboratory:

Remarks:

Bill to: Engineering / Remediation Resources Group, Inc.
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Martinez, CA 94553

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ERRG

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115 Sansome Street, Suite 200
San Francisco, CA 94104
Phone: (415) 395-9974
Fax: (415) 395-9983

720-65322

Lab No.
Address

6/29/2015

Project Contact (Hardcopy or PDF To):		California EDF Report? ☐ Yes ☐ No
Laboratory: TestAmerica		Electronic Deliverables To (Email Address): Samantha.Caruthers-Knight@errg.com
Phone No.:	Fax No.:	Sampler : SCKnight
Project Number: 2014-083	Phase # / Task # 8.02	
Project Name: Mammoth Mill PA/SI		Project Address: Mammoth Lakes
Project Manager: Samantha Caruthers-Knight		

Chain-of-Custody Record and Analysis Request

Sample Designation	Sampling Date	Sampling Time	Container: 8 oz Jar	Matrix: Soil	Matrix: Water	Analysis Request: Cam 17 Metals	Analysis Request: Paste pH	Analysis Request: Hold	12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
MM-S-31	6/3/15	1230	2	X		X	X		std	2		
MM-S-32	6/3/15	1235	2	X		X	X		std	2		
MM-S-33	6/3/15	1240	2	X		X	X		std	2		
MM-S-34	6/3/15	1255	2	X		X	X		std	2		
MM-S-35	6/3/15	1305	2	X		X	X		std	2		
MM-S-36	6/3/15	1310	2	X		X	X		std	2		
MM-S-37	6/3/15	1320	2	X		X	X		std	2		
MM-BG-02	6/3/15	1450	2	X		X	X	X	std	2		
MM-BG-03	6/3/15	1500	2	X		X	X	X	std	2		
MM-BG-04	6/3/15	1510	2	X		X	X	X	std	2		

Relinquished by:	Date	Time	Received by:
[signature]	6/4/15	1250	[signature]
Relinquished by: [signature]	6-8-15	1530	Received by: [signature]
Relinquished by:	Date	Time	Received by Laboratory:

Remarks:

Bill to: Engineering / Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, CA 94553

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Engineering / Remediation Resources Group, Inc.
115 Sansome Street, Suite 200
San Francisco, CA 94104
Phone: (415) 395-9974
Fax: (415) 395-9983

720-65322

Lab No. _____
Address _____

6/29/2015

Project Contact (Hardcopy or PDF To):	California EDF Report? ☐ Yes ☐ No
Laboratory: TestAmerica	Electronic Deliverables To (Email Address): Samantha.Caruthers-Knight@errg.com
Phone No.: / Fax No.:	Sampler : SCKnight
Project Number: 2014-083 / Phase # / Task # 8.02	
Project Name: Mammoth Mill PA/SI	Project Address: Mammoth Lakes
Project Manager: Samantha Caruthers-Knight	

Chain-of-Custody Record and Analysis Request

Sample Designation	Sampling Date	Sampling Time	Container: 8 oz Jar	Matrix: Soil	Matrix: Water	Analysis Request: Cam 17 Metals	Analysis Request: Paste pH	Analysis Request: Hold	12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
MM-BG-05	6/3/15	1525	2	X		X	X	X	std	2		
MM-BG-06	6/3/15	1535	2	X		X	X	X	std	2		
MM-BG-07	6/3/15	1540	2	X		X	X	X	std	2		
MM-BG-08	6/3/15	1600	2	X		X	X	X	std	2		
MM-BG-09	6/3/15	1615	2	X		X	X	X	std	2		
MM-BG-10	6/3/15	1625	2	X		X	X	X	std	2		

Relinquished by:	Date	Time	Received by:
	6/5/15	1450	
Relinquished by:	Date	Time	Received by:
	6-8-15	1530	
Relinquished by:	Date	Time	Received by Laboratory:

Remarks:

Bill to: Engineering / Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, CA 94553

Login Sample Receipt Checklist

Client: Engineering Remediation Resources Group.

Job Number: 720-65322-2

Login Number: 65322
List Number: 1
Creator: Gonzales, Justinn

List Source: TestAmerica Pleasanton

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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(530) 297-4800

September 29, 2015

Samantha Caruthers-Knight
Engineering / Remediation Resources Group, Inc.
115 Sansome Street
Suite 200
San Francisco, CA 94104

RE: Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

Dear Samantha Caruthers-Knight:
Enclosed are the analytical results for sample(s) received by the laboratory on June 10, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised on September 29, 2015 requested by the client to report metals values with MDLs and J-flagged estimates.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Troy G. Turpen

Troy G Turpen
troy.turpen@pacelabs.com
Project Manager

Enclosures

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CERTIFICATIONS

Project:	Mammoth Mill PA/SI revised
Pace Project No.:	1248452

Montana Certification IDs

150 N. 9th Street, Billings, MT 59101
Colorado Asbestos #: 17119
A2LA Certification #: 3590.01
EPA Region 8 Certification #: 8TMS-L
Idaho Certification #: MT00012
Minnesota Dept of Health Certification #: 030-999-442
Montana Certification #: MT CERT0040
North Dakota Dept. Of Health #: R-209
NVLAP Certification #: 101292-0
Washington Department of Ecology #: C993

Davis Cerification IDs

2795 Second Street Suite 300 Davis, CA 95618
North Dakota Certification #: R-214
Oregon Certification #: CA300002
Washington Certification #: C926-14a
California Certification #: 08263CA

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SAMPLE SUMMARY

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1248452001	**MM-WP-01**	Solid	06/02/15 16:00	06/10/15 17:40
1248452002	**MM-WP-02**	Solid	06/02/15 15:25	06/10/15 17:40
1248452003	**MM-WP-03**	Solid	06/02/15 16:30	06/10/15 17:40
1248452004	**MM-WP-04**	Solid	06/03/15 09:10	06/10/15 17:40
1248452005	**MM-WP-05**	Solid	06/02/15 17:00	06/10/15 17:40

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SAMPLE ANALYTE COUNT

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1248452001	**MM-WP-01**	EPA 6010B	JLL	16	PASI-DAV
		EPA 7471A	JLL	1	PASI-DAV
		Modified Sobek 3.2	WT1	1	PASI-MT
		Modified Sobek 3.2	WT1	5	PASI-MT
		Modified Sobek 3.2	WT1	2	PASI-MT
1248452002	**MM-WP-02**	EPA 6010B	JLL	16	PASI-DAV
		EPA 7471A	JLL	1	PASI-DAV
		Modified Sobek 3.2	WT1	1	PASI-MT
		Modified Sobek 3.2	WT1	5	PASI-MT
		Modified Sobek 3.2	WT1	2	PASI-MT
1248452003	**MM-WP-03**	EPA 6010B	JLL	16	PASI-DAV
		EPA 7471A	JLL	1	PASI-DAV
		Modified Sobek 3.2	WT1	1	PASI-MT
		Modified Sobek 3.2	WT1	5	PASI-MT
		Modified Sobek 3.2	WT1	2	PASI-MT
1248452004	**MM-WP-04**	EPA 6010B	JLL	16	PASI-DAV
		EPA 7471A	JLL	1	PASI-DAV
		Modified Sobek 3.2	WT1	1	PASI-MT
		Modified Sobek 3.2	WT1	5	PASI-MT
		Modified Sobek 3.2	WT1	2	PASI-MT
1248452005	**MM-WP-05**	EPA 6010B	JLL	16	PASI-DAV
		EPA 7471A	JLL	1	PASI-DAV
		Modified Sobek 3.2	WT1	1	PASI-MT
		Modified Sobek 3.2	WT1	5	PASI-MT
		Modified Sobek 3.2	WT1	2	PASI-MT

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ANALYTICAL RESULTS

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

Sample: MM-WP-01 **Lab ID: 1248452001** Collected: 06/02/15 16:00 Received: 06/10/15 17:40 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010B Preparation Method: EPA 3050								
Antimony	ND	mg/kg	7.4	1.1	10	06/16/15 08:33	06/16/15 19:56	7440-36-0	
Arsenic	**11.1**	mg/kg	7.4	1.8	10	06/16/15 08:33	06/16/15 19:56	7440-38-2	
Barium	**209**	mg/kg	4.9	0.13	10	06/16/15 08:33	06/16/15 19:56	7440-39-3	
Beryllium	**0.58J**	mg/kg	2.5	0.059	10	06/16/15 08:33	06/16/15 19:56	7440-41-7	
Cadmium	ND	mg/kg	4.9	0.21	10	06/16/15 08:33	06/16/15 19:56	7440-43-9	
Chromium	**12.9**	mg/kg	2.5	0.078	10	06/16/15 08:33	06/16/15 19:56	7440-47-3	
Cobalt	**6.8**	mg/kg	2.5	0.20	10	06/16/15 08:33	06/16/15 19:56	7440-48-4	
Copper	**14.0**	mg/kg	4.9	0.22	10	06/16/15 08:33	06/16/15 19:56	7440-50-8	
Lead	**25.2**	mg/kg	4.9	0.50	10	06/16/15 08:33	06/16/15 19:56	7439-92-1	
Molybdenum	**0.60J**	mg/kg	2.5	0.11	10	06/16/15 08:33	06/16/15 19:56	7439-98-7	
Nickel	**23.2**	mg/kg	2.5	0.18	10	06/16/15 08:33	06/16/15 19:56	7440-02-0	
Selenium	ND	mg/kg	49.0	2.9	10	06/16/15 08:33	06/16/15 19:56	7782-49-2	
Silver	**0.31J**	mg/kg	2.5	0.25	10	06/16/15 08:33	06/16/15 19:56	7440-22-4	
Thallium	ND	mg/kg	7.4	0.67	10	06/16/15 08:33	06/16/15 19:56	7440-28-0	
Vanadium	**28.8J**	mg/kg	245	0.52	10	06/16/15 08:33	06/16/15 19:56	7440-62-2	
Zinc	**45.7**	mg/kg	9.8	0.28	10	06/16/15 08:33	06/16/15 19:56	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471A Preparation Method: EPA 7471A								
Mercury	**16.9**	mg/kg	0.91	0.055	20	06/22/15 14:36	06/22/15 18:07	7439-97-6	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2								
Neutralization Potential	**3.6**	tons/1000	0.50		1		06/24/15 14:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2								
Sulfur, HCl Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 10:05		
Sulfur, HNO3 Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 10:05		
Sulfur, Hot Water Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 10:05		
Sulfur, Residual	ND	% (w/w)	0.050	0.011	1		06/26/15 10:05		
Total Sulfur	ND	% (w/w)	0.050	0.011	1		06/26/15 10:05		
Sobek Calculations	Analytical Method: Modified Sobek 3.2								
Acid/Base Potential	**3.6**	tons/1000			1		06/26/15 13:30		
Acid Potential	**<4.3**	tons/1000	4.3		1		06/26/15 13:30		

Sample: MM-WP-02 **Lab ID: 1248452002** Collected: 06/02/15 15:25 Received: 06/10/15 17:40 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010B Preparation Method: EPA 3050								
Antimony	**1.4J**	mg/kg	7.5	1.2	10	06/16/15 08:33	06/16/15 19:59	7440-36-0	
Arsenic	**8.8**	mg/kg	7.5	1.8	10	06/16/15 08:33	06/16/15 19:59	7440-38-2	
Barium	**250**	mg/kg	5.0	0.13	10	06/16/15 08:33	06/16/15 19:59	7440-39-3	

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ANALYTICAL RESULTS

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

Sample: MM-WP-02 **Lab ID: 1248452002** Collected: 06/02/15 15:25 Received: 06/10/15 17:40 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010B Preparation Method: EPA 3050								
Beryllium	**0.56J**	mg/kg	2.5	0.060	10	06/16/15 08:33	06/16/15 19:59	7440-41-7	
Cadmium	**0.22J**	mg/kg	5.0	0.21	10	06/16/15 08:33	06/16/15 19:59	7440-43-9	
Chromium	**10.9**	mg/kg	2.5	0.080	10	06/16/15 08:33	06/16/15 19:59	7440-47-3	
Cobalt	**6.6**	mg/kg	2.5	0.20	10	06/16/15 08:33	06/16/15 19:59	7440-48-4	
Copper	**21.1**	mg/kg	5.0	0.22	10	06/16/15 08:33	06/16/15 19:59	7440-50-8	
Lead	**46.1**	mg/kg	5.0	0.51	10	06/16/15 08:33	06/16/15 19:59	7439-92-1	
Molybdenum	**0.70J**	mg/kg	2.5	0.11	10	06/16/15 08:33	06/16/15 19:59	7439-98-7	
Nickel	**26.4**	mg/kg	2.5	0.18	10	06/16/15 08:33	06/16/15 19:59	7440-02-0	
Selenium	ND	mg/kg	50.0	2.9	10	06/16/15 08:33	06/16/15 19:59	7782-49-2	
Silver	**1.5J**	mg/kg	2.5	0.25	10	06/16/15 08:33	06/16/15 19:59	7440-22-4	
Thallium	**1.1J**	mg/kg	7.5	0.68	10	06/16/15 08:33	06/16/15 19:59	7440-28-0	
Vanadium	**32.2J**	mg/kg	250	0.53	10	06/16/15 08:33	06/16/15 19:59	7440-62-2	
Zinc	**73.8**	mg/kg	10.0	0.29	10	06/16/15 08:33	06/16/15 19:59	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471A Preparation Method: EPA 7471A								
Mercury	**7.0**	mg/kg	0.94	0.057	20	06/16/15 08:10	06/22/15 18:13	7439-97-6	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2								
Neutralization Potential	**9.6**	tons/1000	0.50		1		06/24/15 14:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2								
Sulfur, HCl Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 10:15		
Sulfur, HNO3 Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 10:15		
Sulfur, Hot Water Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 10:15		
Sulfur, Residual	ND	% (w/w)	0.050	0.011	1		06/26/15 10:15		
Total Sulfur	ND	% (w/w)	0.050	0.011	1		06/26/15 10:15		
Sobek Calculations	Analytical Method: Modified Sobek 3.2								
Acid/Base Potential	**9.6**	tons/1000			1		06/26/15 13:30		
Acid Potential	**<4.3**	tons/1000	4.3		1		06/26/15 13:30		

Sample: MM-WP-03 **Lab ID: 1248452003** Collected: 06/02/15 16:30 Received: 06/10/15 17:40 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010B Preparation Method: EPA 3050								
Antimony	**7.6**	mg/kg	7.4	1.1	10	06/16/15 08:33	06/16/15 20:03	7440-36-0	
Arsenic	**47.5**	mg/kg	7.4	1.8	10	06/16/15 08:33	06/16/15 20:03	7440-38-2	
Barium	**1280**	mg/kg	5.0	0.13	10	06/16/15 08:33	06/16/15 20:03	7440-39-3	
Beryllium	**0.40J**	mg/kg	2.5	0.059	10	06/16/15 08:33	06/16/15 20:03	7440-41-7	
Cadmium	**1.4J**	mg/kg	5.0	0.21	10	06/16/15 08:33	06/16/15 20:03	7440-43-9	
Chromium	**8.0**	mg/kg	2.5	0.079	10	06/16/15 08:33	06/16/15 20:03	7440-47-3	

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ANALYTICAL RESULTS

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

Sample: MM-WP-03 **Lab ID: 1248452003** Collected: 06/02/15 16:30 Received: 06/10/15 17:40 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010B Preparation Method: EPA 3050								
Cobalt	**7.4**	mg/kg	2.5	0.20	10	06/16/15 08:33	06/16/15 20:03	7440-48-4	
Copper	**131**	mg/kg	5.0	0.22	10	06/16/15 08:33	06/16/15 20:03	7440-50-8	
Lead	**345**	mg/kg	5.0	0.50	10	06/16/15 08:33	06/16/15 20:03	7439-92-1	
Molybdenum	**2.9**	mg/kg	2.5	0.11	10	06/16/15 08:33	06/16/15 20:03	7439-98-7	
Nickel	**31.1**	mg/kg	2.5	0.18	10	06/16/15 08:33	06/16/15 20:03	7440-02-0	
Selenium	**4.7J**	mg/kg	49.5	2.9	10	06/16/15 08:33	06/16/15 20:03	7782-49-2	
Silver	**51.2**	mg/kg	2.5	0.25	10	06/16/15 08:33	06/16/15 20:03	7440-22-4	
Thallium	ND	mg/kg	7.4	0.67	10	06/16/15 08:33	06/16/15 20:03	7440-28-0	
Vanadium	**25.8J**	mg/kg	248	0.52	10	06/16/15 08:33	06/16/15 20:03	7440-62-2	
Zinc	**186**	mg/kg	9.9	0.29	10	06/16/15 08:33	06/16/15 20:03	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471A Preparation Method: EPA 7471A								
Mercury	**643**	mg/kg	47.2	2.8	1000	06/22/15 14:36	06/22/15 18:24	7439-97-6	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2								
Neutralization Potential	**1.7**	tons/1000	0.50		1		06/24/15 14:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2								
Sulfur, HCl Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 10:46		
Sulfur, HNO3 Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 10:46		
Sulfur, Hot Water Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 10:46		
Sulfur, Residual	ND	% (w/w)	0.050	0.011	1		06/26/15 10:46		
Total Sulfur	ND	% (w/w)	0.050	0.011	1		06/26/15 10:46		
Sobek Calculations	Analytical Method: Modified Sobek 3.2								
Acid/Base Potential	**1.7**	tons/1000			1		06/26/15 13:30		
Acid Potential	**<4.3**	tons/1000	4.3		1		06/26/15 13:30		

Sample: MM-WP-04 **Lab ID: 1248452004** Collected: 06/03/15 09:10 Received: 06/10/15 17:40 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010B Preparation Method: EPA 3050								
Antimony	**11.2**	mg/kg	7.5	1.2	10	06/16/15 08:33	06/16/15 20:06	7440-36-0	
Arsenic	**27.0**	mg/kg	7.5	1.8	10	06/16/15 08:33	06/16/15 20:06	7440-38-2	
Barium	**1990**	mg/kg	5.0	0.13	10	06/16/15 08:33	06/16/15 20:06	7440-39-3	
Beryllium	**0.43J**	mg/kg	2.5	0.060	10	06/16/15 08:33	06/16/15 20:06	7440-41-7	
Cadmium	**0.63J**	mg/kg	5.0	0.21	10	06/16/15 08:33	06/16/15 20:06	7440-43-9	
Chromium	**7.3**	mg/kg	2.5	0.080	10	06/16/15 08:33	06/16/15 20:06	7440-47-3	
Cobalt	**5.8**	mg/kg	2.5	0.20	10	06/16/15 08:33	06/16/15 20:06	7440-48-4	
Copper	**74.4**	mg/kg	5.0	0.22	10	06/16/15 08:33	06/16/15 20:06	7440-50-8	
Lead	**258**	mg/kg	5.0	0.51	10	06/16/15 08:33	06/16/15 20:06	7439-92-1	

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ANALYTICAL RESULTS

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

Sample: MM-WP-04 **Lab ID: 1248452004** Collected: 06/03/15 09:10 Received: 06/10/15 17:40 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010B Preparation Method: EPA 3050								
Molybdenum	**2.1J**	mg/kg	2.5	0.11	10	06/16/15 08:33	06/16/15 20:06	7439-98-7	
Nickel	**20.1**	mg/kg	2.5	0.18	10	06/16/15 08:33	06/16/15 20:06	7440-02-0	
Selenium	**5.2J**	mg/kg	50.0	2.9	10	06/16/15 08:33	06/16/15 20:06	7782-49-2	
Silver	**53.2**	mg/kg	2.5	0.25	10	06/16/15 08:33	06/16/15 20:06	7440-22-4	
Thallium	ND	mg/kg	7.5	0.68	10	06/16/15 08:33	06/16/15 20:06	7440-28-0	
Vanadium	**25.7J**	mg/kg	250	0.53	10	06/16/15 08:33	06/16/15 20:06	7440-62-2	
Zinc	**111**	mg/kg	10.0	0.29	10	06/16/15 08:33	06/16/15 20:06	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471A Preparation Method: EPA 7471A								
Mercury	**805**	mg/kg	45.5	2.7	1000	06/22/15 14:36	06/22/15 18:26	7439-97-6	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2								
Neutralization Potential	**7.2**	tons/1000	0.50		1		06/24/15 14:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2								
Sulfur, HCl Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 10:57		
Sulfur, HNO3 Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 10:57		
Sulfur, Hot Water Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 10:57		
Sulfur, Residual	ND	% (w/w)	0.050	0.011	1		06/26/15 10:57		
Total Sulfur	ND	% (w/w)	0.050	0.011	1		06/26/15 10:57		
Sobek Calculations	Analytical Method: Modified Sobek 3.2								
Acid/Base Potential	**7.2**	tons/1000			1		06/26/15 13:30		
Acid Potential	**<4.3**	tons/1000	4.3		1		06/26/15 13:30		

Sample: MM-WP-05 **Lab ID: 1248452005** Collected: 06/02/15 17:00 Received: 06/10/15 17:40 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010B Preparation Method: EPA 3050								
Antimony	ND	mg/kg	7.2	1.1	10	06/16/15 08:33	06/16/15 20:10	7440-36-0	
Arsenic	**7.6**	mg/kg	7.2	1.8	10	06/16/15 08:33	06/16/15 20:10	7440-38-2	
Barium	**177**	mg/kg	4.8	0.13	10	06/16/15 08:33	06/16/15 20:10	7440-39-3	
Beryllium	**0.46J**	mg/kg	2.4	0.058	10	06/16/15 08:33	06/16/15 20:10	7440-41-7	
Cadmium	ND	mg/kg	4.8	0.20	10	06/16/15 08:33	06/16/15 20:10	7440-43-9	
Chromium	**6.8**	mg/kg	2.4	0.077	10	06/16/15 08:33	06/16/15 20:10	7440-47-3	
Cobalt	**5.3**	mg/kg	2.4	0.19	10	06/16/15 08:33	06/16/15 20:10	7440-48-4	
Copper	**10.2**	mg/kg	4.8	0.21	10	06/16/15 08:33	06/16/15 20:10	7440-50-8	
Lead	**15.8**	mg/kg	4.8	0.49	10	06/16/15 08:33	06/16/15 20:10	7439-92-1	
Molybdenum	**0.47J**	mg/kg	2.4	0.11	10	06/16/15 08:33	06/16/15 20:10	7439-98-7	
Nickel	**15.3**	mg/kg	2.4	0.17	10	06/16/15 08:33	06/16/15 20:10	7440-02-0	
Selenium	ND	mg/kg	48.1	2.8	10	06/16/15 08:33	06/16/15 20:10	7782-49-2	

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ANALYTICAL RESULTS

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

Sample: MM-WP-05 **Lab ID: 1248452005** Collected: 06/02/15 17:00 Received: 06/10/15 17:40 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010B Preparation Method: EPA 3050								
Silver	**0.58J**	mg/kg	2.4	0.24	10	06/16/15 08:33	06/16/15 20:10	7440-22-4	
Thallium	ND	mg/kg	7.2	0.65	10	06/16/15 08:33	06/16/15 20:10	7440-28-0	
Vanadium	**27.1J**	mg/kg	240	0.51	10	06/16/15 08:33	06/16/15 20:10	7440-62-2	
Zinc	**42.1**	mg/kg	9.6	0.28	10	06/16/15 08:33	06/16/15 20:10	7440-66-6	
7471 Mercury	Analytical Method: EPA 7471A Preparation Method: EPA 7471A								
Mercury	**7.0**	mg/kg	0.89	0.054	20	06/22/15 14:36	06/22/15 18:21	7439-97-6	
Sobek Acid Base Potential	Analytical Method: Modified Sobek 3.2								
Neutralization Potential	**8.0**	tons/1000	0.50		1		06/24/15 14:00		
Sobek Extractable Sulfur	Analytical Method: Modified Sobek 3.2								
Sulfur, HCl Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 11:26		
Sulfur, HNO3 Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 11:26		
Sulfur, Hot Water Extractable	ND	% (w/w)	0.050	0.011	1		06/26/15 11:26		
Sulfur, Residual	ND	% (w/w)	0.050	0.011	1		06/26/15 11:26		
Total Sulfur	ND	% (w/w)	0.050	0.011	1		06/26/15 11:26		
Sobek Calculations	Analytical Method: Modified Sobek 3.2								
Acid/Base Potential	**8.0**	tons/1000			1		06/26/15 13:30		
Acid Potential	**<4.3**	tons/1000	4.3		1		06/26/15 13:30		

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QUALITY CONTROL DATA

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

QC Batch: DAMP/1258 | Analysis Method: EPA 6010B
QC Batch Method: EPA 3050 | Analysis Description: 6010 MET
Associated Lab Samples: 1248452001, 1248452002, 1248452003, 1248452004, 1248452005

METHOD BLANK: 219279 | Matrix: Solid
Associated Lab Samples: 1248452001, 1248452002, 1248452003, 1248452004, 1248452005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.75	06/16/15 19:32	
Arsenic	mg/kg	ND	0.75	06/16/15 19:32	
Barium	mg/kg	0.11J	0.50	06/16/15 19:32	
Beryllium	mg/kg	ND	0.25	06/16/15 19:32	
Cadmium	mg/kg	ND	0.50	06/16/15 19:32	
Chromium	mg/kg	ND	0.25	06/16/15 19:32	
Cobalt	mg/kg	ND	0.25	06/16/15 19:32	
Copper	mg/kg	ND	0.50	06/16/15 19:32	
Lead	mg/kg	ND	0.50	06/16/15 19:32	
Molybdenum	mg/kg	ND	0.25	06/16/15 19:32	
Nickel	mg/kg	ND	0.25	06/16/15 19:32	
Selenium	mg/kg	ND	5.0	06/16/15 19:32	
Silver	mg/kg	ND	0.25	06/16/15 19:32	
Thallium	mg/kg	ND	0.75	06/16/15 19:32	
Vanadium	mg/kg	ND	25.0	06/16/15 19:32	
Zinc	mg/kg	0.34J	1.0	06/16/15 19:32	

LABORATORY CONTROL SAMPLE: 219280

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	50	45.3	91	80-120	
Arsenic	mg/kg	50	48.2	96	80-120	
Barium	mg/kg	50	49.8	100	80-120	
Beryllium	mg/kg	50	50.0	100	80-120	
Cadmium	mg/kg	50	49.5	99	80-120	
Chromium	mg/kg	50	49.7	99	80-120	
Cobalt	mg/kg	50	49.4	99	80-120	
Copper	mg/kg	50	45.6	91	80-120	
Lead	mg/kg	50	50.2	100	80-120	
Molybdenum	mg/kg	50	50.6	101	80-120	
Nickel	mg/kg	50	47.7	95	80-120	
Selenium	mg/kg	50	48.8	98	80-120	
Silver	mg/kg	25	25.8	103	80-120	
Thallium	mg/kg	50	49.4	99	80-120	
Vanadium	mg/kg	50	48.1	96	80-120	
Zinc	mg/kg	50	50.2	100	80-120	

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QUALITY CONTROL DATA

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 219281 219282

Parameter	Units	1248484001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	ND	46.7	50	9.4	11.2	18	20	75-125	17	20	M6
Arsenic	mg/kg	ND	46.7	50	54.0	54.4	108	102	75-125	1	20	
Barium	mg/kg	94.8	46.7	50	167	157	154	125	75-125	6	20	M6
Beryllium	mg/kg	ND	46.7	50	60.2	55.4	128	110	75-125	8	20	M6
Cadmium	mg/kg	ND	46.7	50	54.5	55.1	117	110	75-125	1	20	
Chromium	mg/kg	84.2	46.7	50	230	174	312	180	75-125	28	20	M6,R1
Cobalt	mg/kg	12.0	46.7	50	65.2	66.2	114	108	75-125	2	20	
Copper	mg/kg	15.3	46.7	50	73.1	68.2	124	106	75-125	7	20	
Lead	mg/kg	5.0	46.7	50	58.1	59.8	114	110	75-125	3	20	
Molybdenum	mg/kg	ND	46.7	50	45.6	47.8	97	95	75-125	5	20	
Nickel	mg/kg	194	46.7	50	275	270	173	151	75-125	2	20	M6
Selenium	mg/kg	ND	46.7	50	55.9	55.0	120	110	75-125	2	20	
Silver	mg/kg	ND	23.4	25	29.1	27.1	124	108	75-125	7	20	
Thallium	mg/kg	ND	46.7	50	51.8	51.3	111	103	75-125	1	20	
Vanadium	mg/kg	ND	46.7	50	101J	95.9J	127	108	75-125		20	M6
Zinc	mg/kg	38.6	46.7	50	101	101	133	125	75-125	0	20	M6

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QUALITY CONTROL DATA

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

QC Batch: DAMP/1281 Analysis Method: EPA 7471A
QC Batch Method: EPA 7471A Analysis Description: 7471 Mercury
Associated Lab Samples: 1248452001, 1248452003, 1248452004, 1248452005

METHOD BLANK: 221670 Matrix: Solid
Associated Lab Samples: 1248452001, 1248452003, 1248452004, 1248452005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.049	06/22/15 18:03	

LABORATORY CONTROL SAMPLE: 221671

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.091	0.088	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 221672 221673

Parameter	Units	1248452001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	16.9	.093	.096	11.3	9.8	-6100	-7400	85-115	14	20	M6

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QUALITY CONTROL DATA

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

QC Batch: MT/19440 Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 Analysis Description: Sobek Acid Base Potential
Associated Lab Samples: 1248452001, 1248452002, 1248452003, 1248452004, 1248452005

METHOD BLANK: 2004016 Matrix: Solid
Associated Lab Samples: 1248452001, 1248452002, 1248452003, 1248452004, 1248452005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Neutralization Potential	tons/1000	<0.5	0.50	06/24/15 14:00	

SAMPLE DUPLICATE: 2004017

Parameter	Units	1248452005 Result	Dup Result	RPD	Max RPD	Qualifiers
Neutralization Potential	tons/1000	8.0	9.8			

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QUALITY CONTROL DATA

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

QC Batch: MT/19462 | Analysis Method: Modified Sobek 3.2
QC Batch Method: Modified Sobek 3.2 | Analysis Description: Sobek Extractable Sulfur
Associated Lab Samples: 1248452001, 1248452002, 1248452003, 1248452004, 1248452005

METHOD BLANK: 2005429 | Matrix: Solid
Associated Lab Samples: 1248452001, 1248452002, 1248452003, 1248452004, 1248452005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfur, HCl Extractable	% (w/w)	ND	0.050	06/26/15 09:55	
Sulfur, HNO3 Extractable	% (w/w)	ND	0.050	06/26/15 09:55	
Sulfur, Hot Water Extractable	% (w/w)	ND	0.050	06/26/15 09:55	
Sulfur, Residual	% (w/w)	ND	0.050	06/26/15 09:55	
Total Sulfur	% (w/w)	ND	0.050	06/26/15 09:55	

LABORATORY CONTROL SAMPLE: 2005430

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Sulfur	% (w/w)	.89	0.940	106	80-120	

SAMPLE DUPLICATE: 2005431

Parameter	Units	1248452005 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfur, HCl Extractable	% (w/w)	ND	ND		20	
Sulfur, HNO3 Extractable	% (w/w)	ND	ND		20	
Sulfur, Hot Water Extractable	% (w/w)	ND	ND		20	
Sulfur, Residual	% (w/w)	ND	ND		20	
Total Sulfur	% (w/w)	ND	ND		20	

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QUALIFIERS

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DAV	Pace Analytical Services - Davis
PASI-MT	Pace Analytical Services - Montana

ANALYTE QUALIFIERS

M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1	RPD value was outside control limits.

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Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Mammoth Mill PA/SI revised
Pace Project No.: 1248452

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1248452001	**MM-WP-01**	EPA 3050	DAMP/1258	EPA 6010B	DAMT/1278
1248452002	**MM-WP-02**	EPA 3050	DAMP/1258	EPA 6010B	DAMT/1278
1248452003	**MM-WP-03**	EPA 3050	DAMP/1258	EPA 6010B	DAMT/1278
1248452004	**MM-WP-04**	EPA 3050	DAMP/1258	EPA 6010B	DAMT/1278
1248452005	**MM-WP-05**	EPA 3050	DAMP/1258	EPA 6010B	DAMT/1278
1248452001	**MM-WP-01**	EPA 7471A	DAMP/1281	EPA 7471A	DAMT/1306
1248452002	**MM-WP-02**	EPA 7471A	DAMP/1259	EPA 7471A	DAMT/1306
1248452003	**MM-WP-03**	EPA 7471A	DAMP/1281	EPA 7471A	DAMT/1306
1248452004	**MM-WP-04**	EPA 7471A	DAMP/1281	EPA 7471A	DAMT/1306
1248452005	**MM-WP-05**	EPA 7471A	DAMP/1281	EPA 7471A	DAMT/1306
1248452001	**MM-WP-01**	Modified Sobek 3.2	MT/19440		
1248452002	**MM-WP-02**	Modified Sobek 3.2	MT/19440		
1248452003	**MM-WP-03**	Modified Sobek 3.2	MT/19440		
1248452004	**MM-WP-04**	Modified Sobek 3.2	MT/19440		
1248452005	**MM-WP-05**	Modified Sobek 3.2	MT/19440		
1248452001	**MM-WP-01**	Modified Sobek 3.2	MT/19462		
1248452002	**MM-WP-02**	Modified Sobek 3.2	MT/19462		
1248452003	**MM-WP-03**	Modified Sobek 3.2	MT/19462		
1248452004	**MM-WP-04**	Modified Sobek 3.2	MT/19462		
1248452005	**MM-WP-05**	Modified Sobek 3.2	MT/19462		
1248452001	**MM-WP-01**	Modified Sobek 3.2	MT/19484		
1248452002	**MM-WP-02**	Modified Sobek 3.2	MT/19484		
1248452003	**MM-WP-03**	Modified Sobek 3.2	MT/19484		
1248452004	**MM-WP-04**	Modified Sobek 3.2	MT/19484		
1248452005	**MM-WP-05**	Modified Sobek 3.2	MT/19484		

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ERRG
Engineering / Remediation Resources Group, Inc.
115 Sansome Street, Suite 200
San Francisco, CA 94104
Phone: (415) 395-9974
Fax: (415) 395-9983

Lab No. 1248452
Address

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To):	California EDF Report? ☐ Yes ☐ No
Laboratory: Pace Analytical	Electronic Deliverables To (Email Address): Samantha.Caruthers-Knight@errg.com
Phone No.: / Fax No.:	Sampler : SCKnight
Project Number: 2014-083 / Phase # / Task # 8.02	
Project Name: Mammoth Mill PA/SI	Project Address: Mammoth Lakes
Project Manager: Samantha Caruthers-Knight	

Sample Designation	Sampling Date	Sampling Time	Container 8 oz Jar	Container 4 oz Jar	Matrix Soil	Matrix Water	Title 22 Metals incl Hg	Acid Base Potetial	Nutrilization Potential	Acid Potential	Sulfur Forms	12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
MM-WP-01	6/2/15	1600	2	1	X		X	X	X	X	X	std	3		001
MM-WP-02	6/2/15	1525	2	1	X		X	X	X	X	X	std	3		002
MM-WP-03	6/2/15	1630	2	1	X		X	X	X	X	X	std	3		003
MM-WP-04	6/3/15	910	2	1	X		X	X	X	X	X	std	3		004
MM-WP-05	6/2/15	1700	2	1	X		X	X	X	X	X	std	3		005

Relinquished by:	Date	Time	Received by:
[signature]	6/10/15	1325	Harold Brewer
Relinquished by: Harold Brewer	061015	1740	Received by: Pace 061015 1740
Relinquished by:	Date	Time	Received by Laboratory:

Remarks:

Bill to: Engineering / Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, CA 94553

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 25Feb2015 Page 1 of 1
	Document No.: **F-DAV-C-002-rev.02**	Issuing Authority: Pace Davis, CA Quality Office

Sample Condition Upon Receipt

Client Name: ERRG

Project #: WO# : 1248452

1248452

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace ☐ OnTrac ☐ Other:_____

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No **Seals Intact?** ☐ Yes ☐ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other:_____ **Temp Blank?** ☐ Yes ☒ No

Thermom. Used: ☒ DA1434 ☐ DA2285 **Type of Ice:** ☒ Wet ☐ Blue ☐ Dry Ice ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read(°C): 0.6 **Cooler Temp Corrected(°C):** 0.6 **Biological Tissue Frozen?** ☐ Yes ☐ No ☒ N/A

Temp should be above freezing to 6°C **Correction Factor:** 0.0 **Date and Initials of Person Examining Contents:** 061015 TJB

				Comments:
Chain of Custody Present?	☒ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☒ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☒ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☒ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☒ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☒ No	☐ N/A	7.
Sufficient Volume?	☒ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☒ Yes	☐ No	☐ N/A	
Containers Intact?	☒ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: SL	☒ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☒ N/A	13. ☐ HNO_3 ☐ H_2SO_4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☐ No	☒ N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	☐ Yes	☐ No		Initial when completed:_____ Lot # of added preservative:_____
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☒ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☒ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	
Pace Trip Blank Lot # (if purchased):_____				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [signature] **Date:** 6/23/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical	Document Name: Davis to VM Sample Transfer Form	Revised Date: [illegible] Page: 1 of 1
	Document Number: F-DAV-C-013-rev.00	Issuing Authority: Pace Davis Quality Office

10311129

Virginia

Shipping:	Fed Ex
Tracking #:	
Client:	ERRG
Due Date:	7 Day TAT
Pace WO:	1248452
Project Manager:	Scott Forbes

Davis to VM Sample Transfer Condition Upon Receipt Form

ANALYSIS REQUESTED

Work Order Number	Sample(s)	# of Bottles	Analytical Requirement(s)	Preservative(s)	Verify Arrival Date & Initials
1248452	001	02	TBD	None	
	002				
	003				
	004				
	005				

REPORTING REQUIREMENTS/ADDITIONAL COMMENTS

Virginia MN SAMPLE RECEIPT INFORMATION

IR Gun: 140792808 , Correction Factor: +0.3		Sample Matrix:	SL
Cooler Temp Read (°C):	Cooler Temp Corrected (°C):	Filtred volume rec'd for dissolved tests:	Yes __ No__ NA X
Arrived on Ice:	Yes X No__	Samples pH have been checked:	Yes __ No__ NA X
Custody Seal Present:	Yes X No__	Trip Blank Present:	Yes __ No__ NA X
Short Hold Time Requested < 72 Hours:	Yes __ No X	Trip Blank Custody Seals Present:	Yes __ No__ NA X
Rush TAT Requested:	Yes __ No X	Pace Trip Blank Lot #:	
Sufficient Sample Volume:	Yes X No__	Sample Composites Required:	Yes __ No__ NA __
Samples Arrived within Hold Time:	Yes X No__	Report Samples:	Wet Wt. __ Dry Wt. __
Containers Intact:	Yes X No__	Reporting Units:	

CUSTODY TRANSFER

Relinquished by/Affiliation	Date	Time	Accepted By Affiliation	Date	Time
SCF PACE Analytical	06/11/15	1600	[illegible]	6/12/15	1200

CLIENT NOTIFICATION/RESOLUTION

Date: _____

Person Contacted: _____

Comments/Resolution: _____

Project Manager Review: [illegible] Date: 6/20/15

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1746848

Section A Required Client Information:

Company: PASI - Davis
Address:
Davis, CA
Email To: Scott Forbes
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Scott Forbes
Copy To: Jason Jude
Purchase Order No.:
Project Name:
Project Number:

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE:

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / .-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N): See Attached Cofc

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	1248452001					6/2/15	1600		2									K		001
2	002						1525													002
3	003						1630													003
4	004						910													004
5	005						1700													005
6																				
7																				
8																				
9																				
10																				
11																				
12																				

10311129

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature] Fed Ex	6/3/15	1540	Nilsson/Pace	6/9/15	0925	1.0	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

ERRG
Engineering / Remediation Resources Group, Inc.
115 Sansome Street, Suite 200
San Francisco, CA 94104
Phone: (415) 395-9974
Fax: (415) 395-9983

Lab No.
Address

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To):

California EDF Report? ☐ Yes ☐ No

Laboratory: Pace Analytical

Electronic Deliverables To (Email Address): Samantha.Caruthers-Knight@errg.com

Phone No.:

Fax No.:

Sampler : SCKnight

Project Number: 2014-083

Phase # / Task # 8.02

Project Name: Mammoth Mill PA/SI

Project Address: Mammoth Lakes

Project Manager: Samantha Caruthers-Knight

Sample Designation	Sampling Date	Sampling Time	Container 8 oz Jar	Container 4 oz Jar	Matrix Soil	Matrix Water	Title 22 Metals incl Hg	Acid Base Potential	Nutrilization Potential	Acid Potential	Sulfur Forms	12 hr/ 24 hr/ 48 hr/ 72 hr/STD (1 wk) TAT	Number of Containers	Comments	For Lab Use Only
MM-WP-01	6/2/15	1600	2	1	X		X	X	X	X	X	std	3		001
MM-WP-02	6/2/15	1525	2	1	X		X	X	X	X	X	std	3		002
MM-WP-03	6/2/15	1630	2	1	X		X	X	X	X	X	std	3		003
MM-WP-04	6/3/15	910	2	1	X		X	X	X	X	X	std	3		004
MM-WP-05	6/2/15	1700	2	1	X		X	X	X	X	X	std	3		005

Relinquished by:	Date	Time	Received by:
	6/10/15	1325	Harold Brewer
Relinquished by:	Date	Time	Received by:
Harold Brewer	061015	1740	Pace 061015 1740
Relinquished by:	Date	Time	Received by Laboratory:

Remarks:

Bill to: Engineering / Remediation Resources Group, Inc.
4585 Pacheco Blvd, Suite 200
Martinez, CA 94553

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 23Feb2015 Page 1 of 1
	Document No.: F-MT-C-184-rev.06	Issuing Authority: Pace Montana Quality Office

Sample Condition Upon Receipt

Client Name: Pace CA

Project #: WO#: 10311129

10311129

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace [ ] Other:

Tracking Number: 7738 6794

Custody Seal on Cooler/Box Present? [X] Yes [ ] No **Seals Intact?** [X] Yes [ ] No

Optional: Proj. Due Date: Proj. Name:

Packing Material: [X] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other: **Temp Blank?** [X] Yes [ ] No

Thermometer Used: [X] 140821733 [ ] NA **Type of Ice:** [X] Wet [ ] Blue [ ] None [ ] Samples on ice, cooling process has begun

Cooler Temp Read: 1.0 **Date and Initials of Person Examining Contents:** 6/19 AH

Cooler Temp Corrected: 1.0 **Biological Tissue Frozen?** [ ] Yes [X] No

Temp should be above freezing to 6°C

				Comments:
Chain of Custody Present?	[X] Yes	[ ] No	[ ] N/A	1.
Chain of Custody Filled Out?	[X] Yes	[ ] No	[ ] N/A	2.
Chain of Custody Relinquished?	[X] Yes	[ ] No	[ ] N/A	3.
Sampler Name and Signature on COC?	[ ] Yes	[X] No	[ ] N/A	4.
Samples Arrived within Hold Time?	[X] Yes	[ ] No	[ ] N/A	5.
Short Hold Time Analysis (<72 hr)?	[ ] Yes	[X] No	[ ] N/A	6.
Rush Turn Around Time Requested?	[X] Yes	[ ] No	[ ] N/A	7.
Sufficient Volume?	[X] Yes	[ ] No	[ ] N/A	8.
Correct Containers Used?	[X] Yes	[ ] No	[ ] N/A	9.
-Pace Containers Used?	[X] Yes	[ ] No	[ ] N/A	
Containers Intact?	[X] Yes	[ ] No	[ ] N/A	10.
Filtered Volume Received for Dissolved Tests?	[ ] Yes	[X] No	[ ] N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: SL	[X] Yes	[ ] No	[ ] N/A	12.
All containers needing acid/base preservation have been checked?	[ ] Yes	[ ] No	[X] N/A	13. [ ] HNO_3 [ ] H_2SO_4 [ ] NaOH [ ] HCl Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	[ ] Yes	[ ] No	[X] N/A	NA
Exceptions: VOA, Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ] Yes	[X] No		Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	[ ] Yes	[ ] No	[X] N/A	14.
Trip Blank Present?	[ ] Yes	[ ] No	[X] N/A	15.
Trip Blank Custody Seals Present?	[ ] Yes	[ ] No	[X] N/A	
Pace Trip Blank Lot # (if purchased): NA				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** [ ] Yes [ ] No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: **Date:** 6/22/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Appendix E. Background Threshold Value Analysis

Mammoth Mill PA/SI Background Analysis, conducted by Jim Van de Water, Principal Hydrogeologist: Thomas Harder & Company (Due to size, this appendix is provided on CD only.)

Statistical Analysis

Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
0.15	3.9	100	0.05	0.11	3	1.9	5.8	16	0.23	0.33	4.1	0.11	0.29	0.36	11	22
0.4	5.6	83	0.11	0.12	5.7	3.8	6.9	8.6	0.17	0.41	12	0.18	0.056	0.41	18	35
0.88	6.9	200	0.11	0.15	12	7	21	9.5	0.32	0.34	22	0.21	0.32	0.35	38	50
0.37	4.9	120	0.19	0.13	6.6	4.8	10	9.1	0.21	0.47	15	0.79	0.20	0.39	21	36
0.12	5.1	80	0.096	0.049	7.3	3.5	5.8	8.9	1.4	0.61	11	0.73	0.18	0.48	22	23
0.45	3.9	92	0.089	0.11	6.1	2.5	3.8	6.1	0.39	0.52	7.2	0.72	0.10	0.45	23	19
0.22	9	180	0.082	0.1	6.8	4.2	12	39	0.24	0.5	19	0.67	0.35	0.41	21	58
0.077	12	240	0.081	0.058	9	5.4	9.9	9.5	0.62	0.48	18	0.75	0.33	0.4	30	32
0.084	11	150	0.093	0.051	3.9	2.9	5.4	6.5	0.32	0.46	6.1	0.51	0.37	0.46	21	21
0.11	25	230	0.076	0.071	5	3.2	7.3	10	3.2	0.52	7.4	0.39	0.44	0.38	25	28

Mercury in method blank at 0.00308J mg/kg for MM-BG-01. Concentration is insignificant compared to detected value (0.23 mg/kg) so no adjustment was made to detected value for BTV calculations.
Mercury in method blank at 0.00300J mg/kg for 2015 data. Concentration is insignificant compared to detected values (0.17 to 3.2 mg/kg) so no adjustment was made to detected value for BTV calculations.

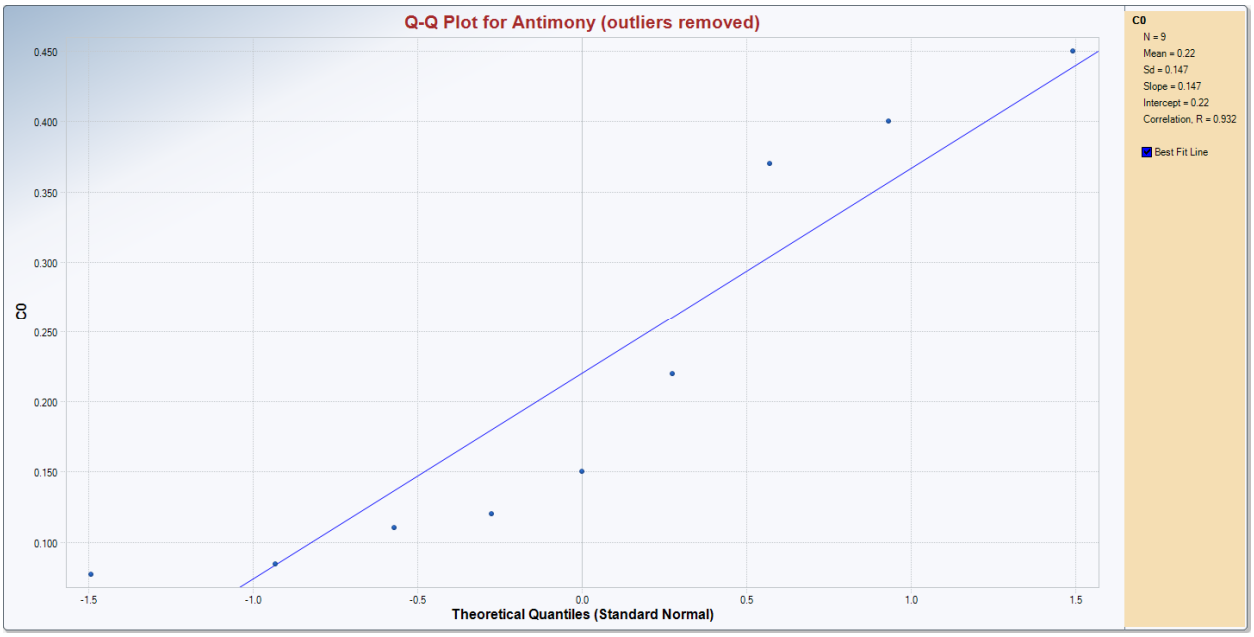
Outliers, as identified with box and normal Q-Q plots, removed. All ND samples retained at the full reporting limit (unless they were an outlier)

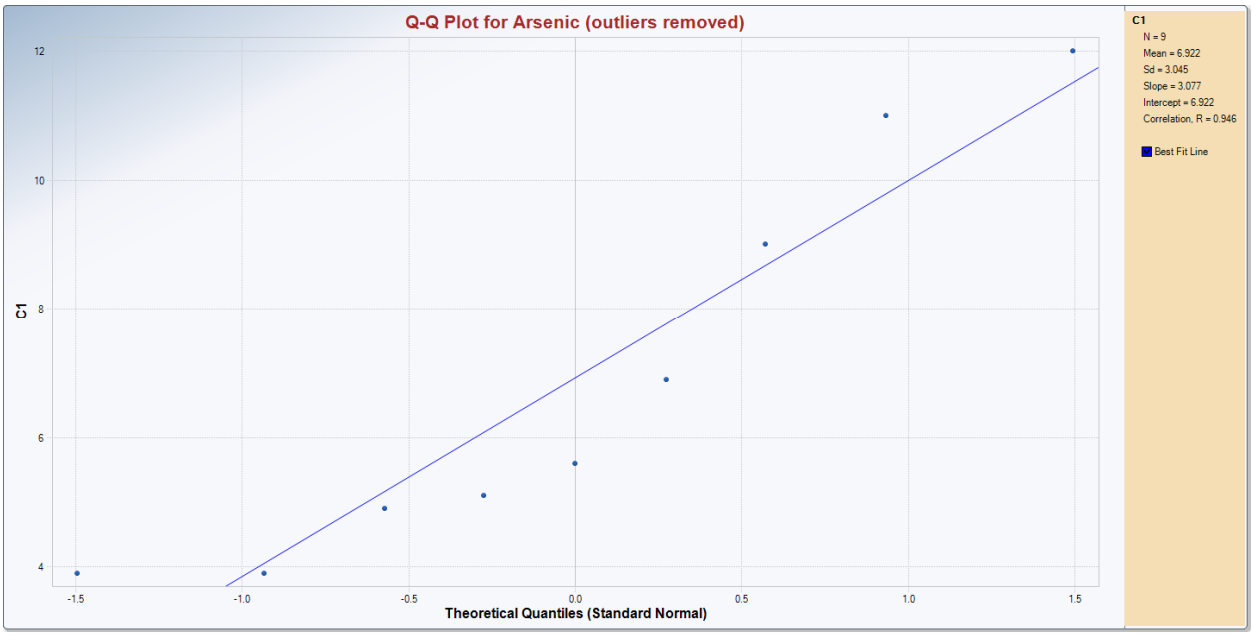
Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
0.15	3.9	100	0.11	0.11	3	1.9	5.8	8.6	0.23	0.33	4.1	0.11	0.29	0.36	11	22
0.4	5.6	83	0.11	0.12	5.7	3.8	6.9	9.5	0.17	0.41	12	0.18	0.056	0.41	18	35
0.37	6.9	200	0.096	0.15	12	7	10	9.1	0.32	0.34	22	0.21	0.32	0.35	38	50
0.12	4.9	120	0.089	0.13	6.6	4.8	5.8	8.9	0.21	0.47	15	0.79	0.20	0.39	21	36
0.45	5.1	80	0.082	0.049	7.3	3.5	3.8	6.1	0.39	0.61	11	0.73	0.18	0.48	22	23
0.22	3.9	92	0.081	0.11	6.1	2.5	12	9.5	0.24	0.52	7.2	0.72	0.10	0.45	23	19
0.077	9	180	0.093	0.1	6.8	4.2	9.9	6.5	0.32	0.5	19	0.67	0.35	0.41	21	58
0.084	12	240	0.076	0.058	9	5.4	5.4	10		0.48	18	0.75	0.33	0.4	30	32
0.11	11	150		0.051	3.9	2.9	7.3			0.46	6.1	0.51	0.37	0.46	21	21
		230		0.071	5	3.2				0.52	7.4	0.39	0.44	0.38	25	28

Variable	# Samples	# of NDs	# Detected in Blank Sample	# of Outliers Removed	NumObs (population size on which stats were run)
Antimony	10	1	0	1	9
Arsenic	10	0	0	1	9
Barium	10	0	0	0	10
Beryllium	10	6	0	2	8
Cadmium	10	1	0	0	10
Chromium	10	0	0	0	10
Cobalt	10	0	0	0	10
Copper	10	0	0	1	9
Lead	10	0	0	2	8
Mercury	10	0	10	3	7
Molybdenum	10	0	0	0	10
Nickel	10	0	0	0	10
Selenium	10	2	6	0	10
Silver	10	1	0	0	10
Thallium	10	10	0	0	10
Vanadium	10	0	0	0	10
Zinc	10	0	0	0	10

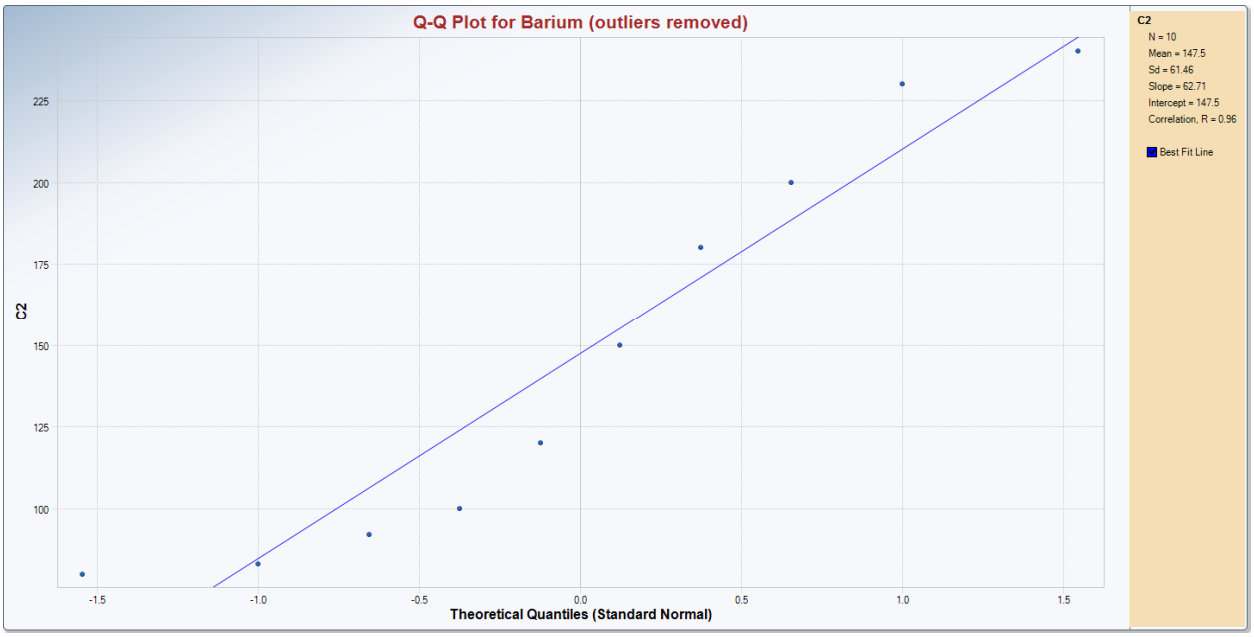
Variable	90%ile	95%ile	99%ile	Normal Distribution?	BTV	Note	Comment
Antimony	0.41	0.43	0.446	Yes	0.531	95th USL	-
Arsenic	11.2	11.6	11.92	Yes	13.34	95th USL	-
Barium	231	235.5	239.1	Yes	281.2	95th USL	-
Beryllium	0.11	0.11	0.11	Yes	0.118	95th USL	-
Cadmium	0.132	0.141	0.148	Yes	0.172	95th USL	-
Chromium	9.3	10.65	11.73	Yes	12.12	95th USL	-
Cobalt	5.56	6.28	6.856	Yes	7.194	95th USL	-
Copper	10.4	11.2	11.84	Yes	13.04	95th USL	-
Lead	9.65	9.825	9.965	Yes	11.45	95th USL	-
Mercury	0.348	0.369	0.386	Yes	0.418	95th USL	B flag insignificant
Molybdenum	0.529	0.57	0.602	Yes	0.65	95th USL	-
Nickel	19.3	20.65	21.73	Yes	25.48	95th USL	-
Selenium	0.754	0.772	0.786	Yes	1.08	95th USL	-
Silver	0.377	0.409	0.434	Yes	0.534	95th USL	-
Thallium	0.462	0.471	0.478	Yes	-	-	All ND
Vanadium	30.8	34.4	37.28	Yes	38.56	95th USL	-
Zinc	50.8	54.4	57.28	Yes	60.59	95th USL	-

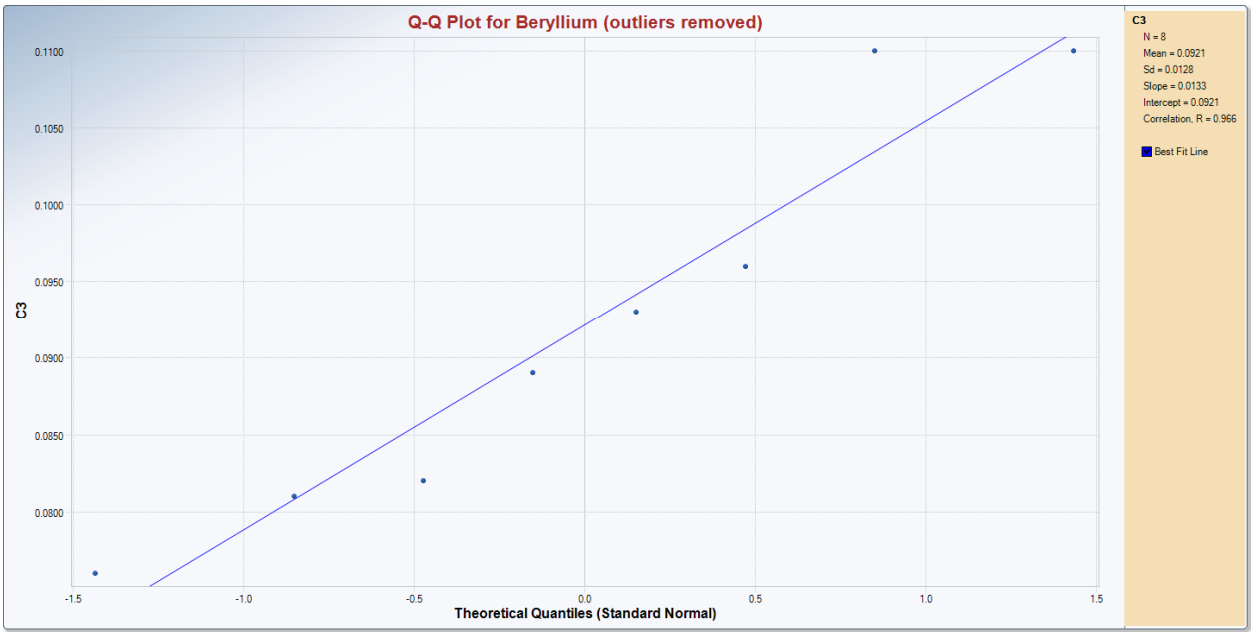
Metal-Specific Q-Q Plots (outliers removed)



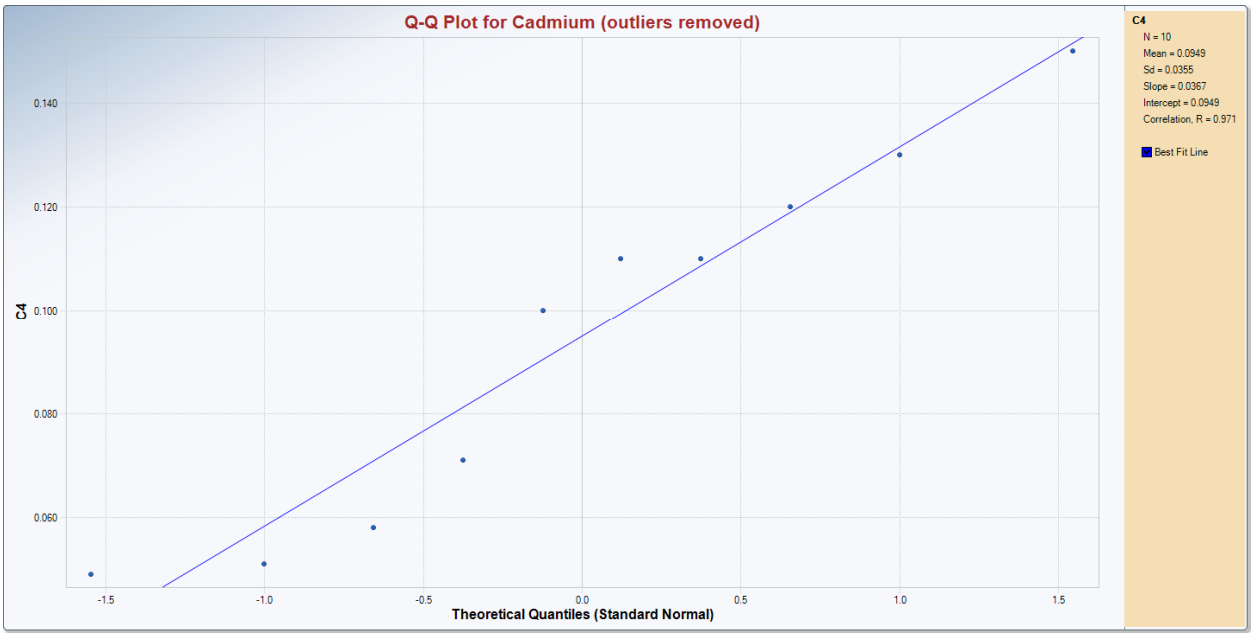


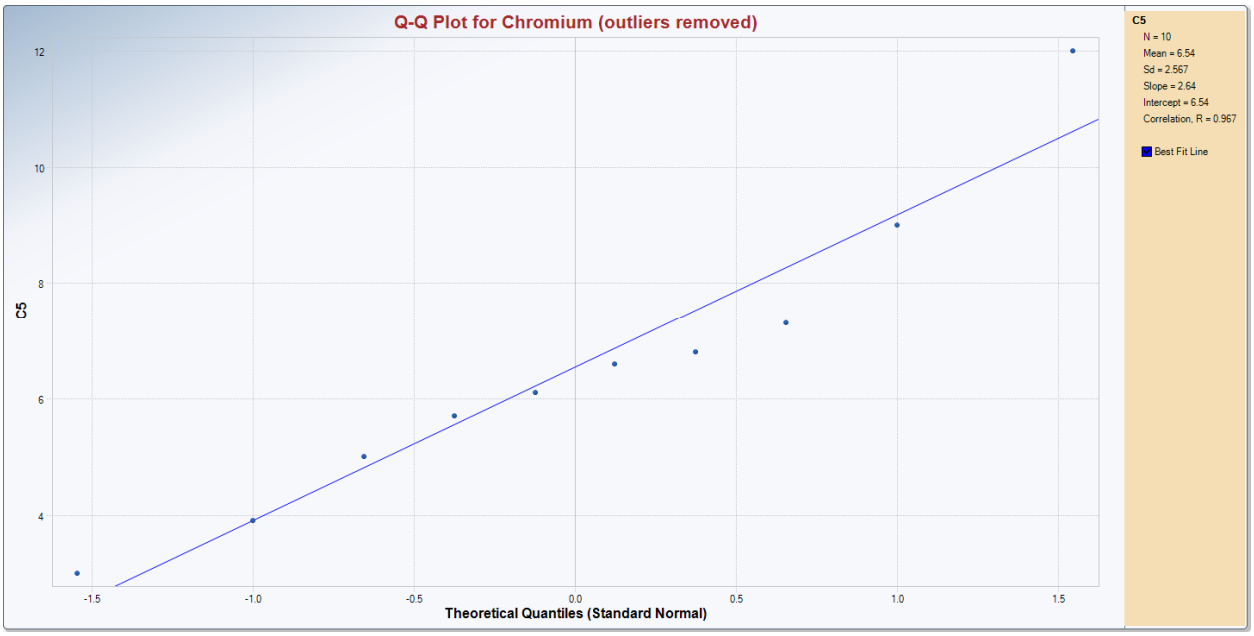
Metal-Specific Q-Q Plots (outliers removed)



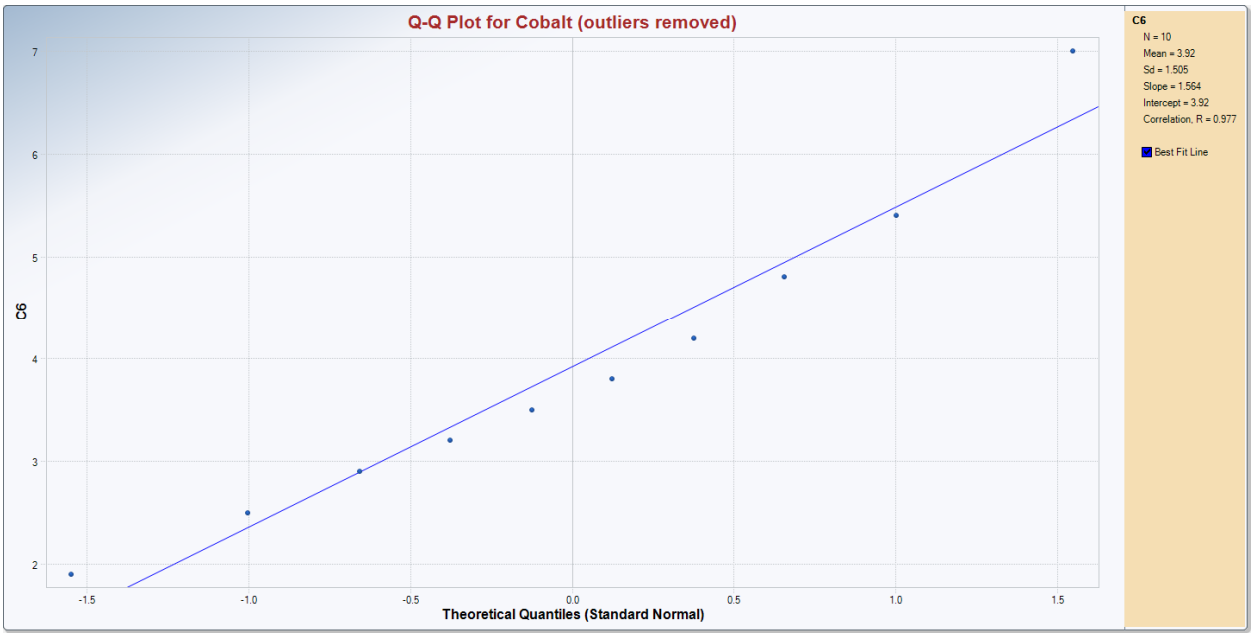


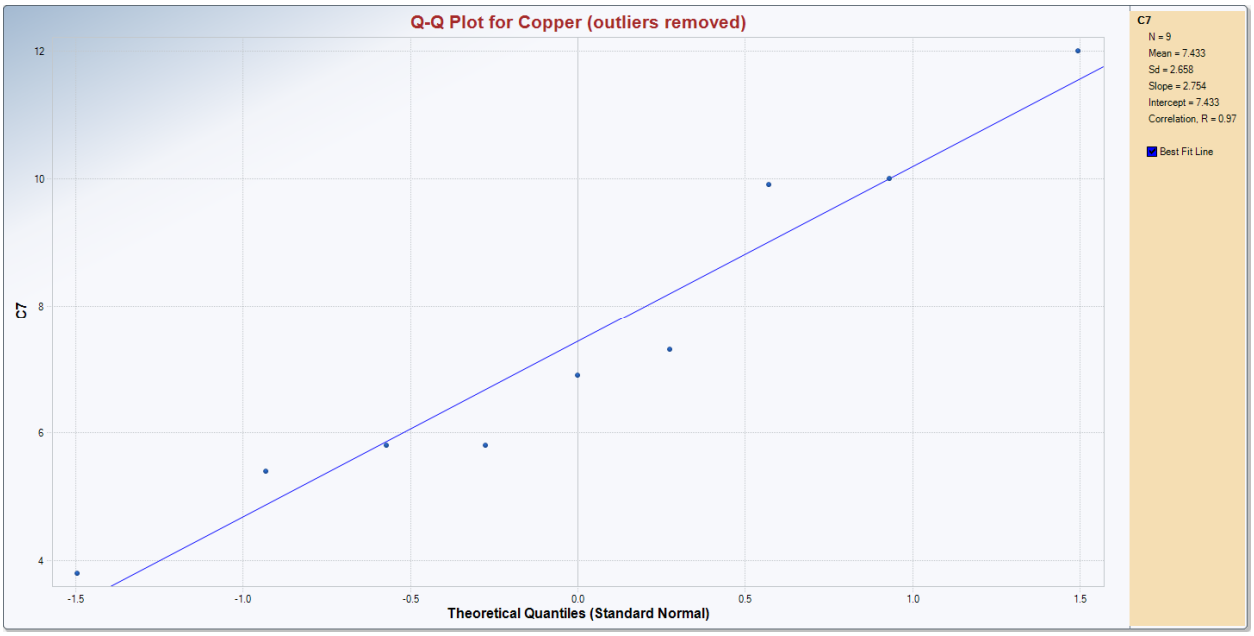
Metal-Specific Q-Q Plots (outliers removed)



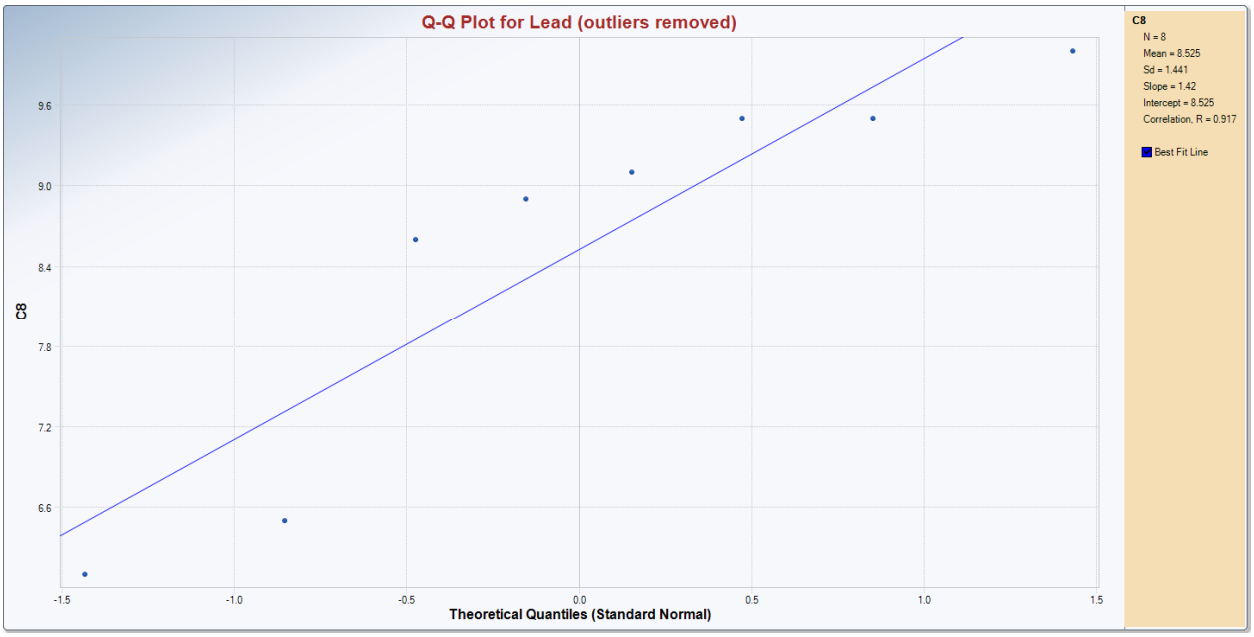


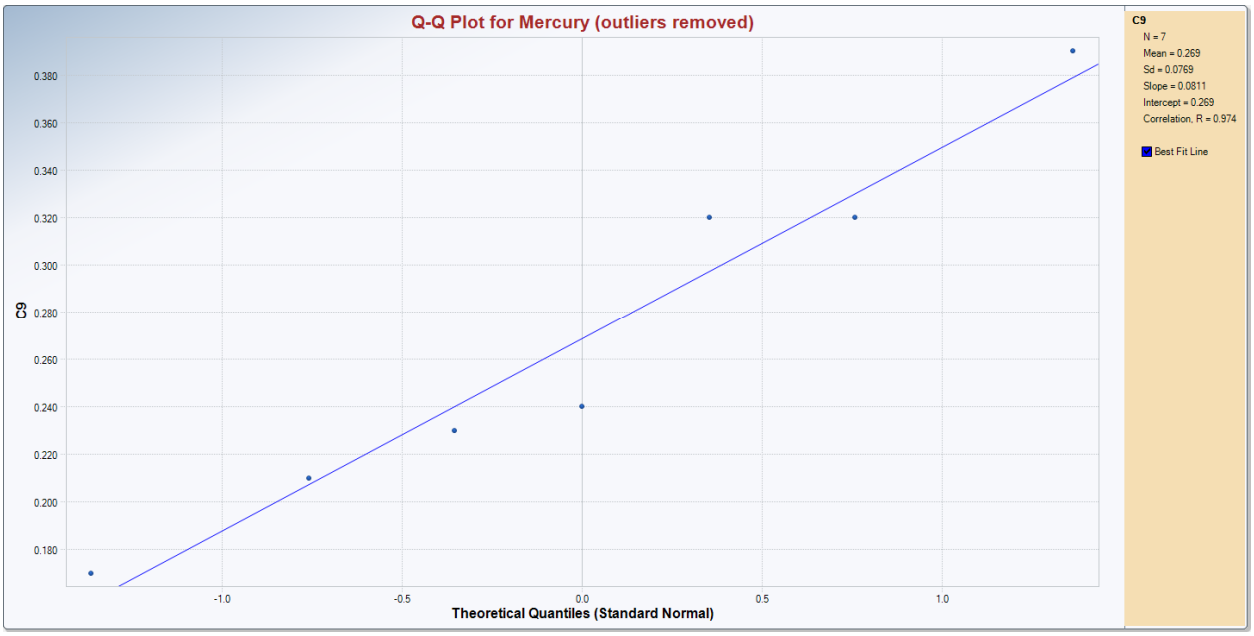
Metal-Specific Q-Q Plots (outliers removed)



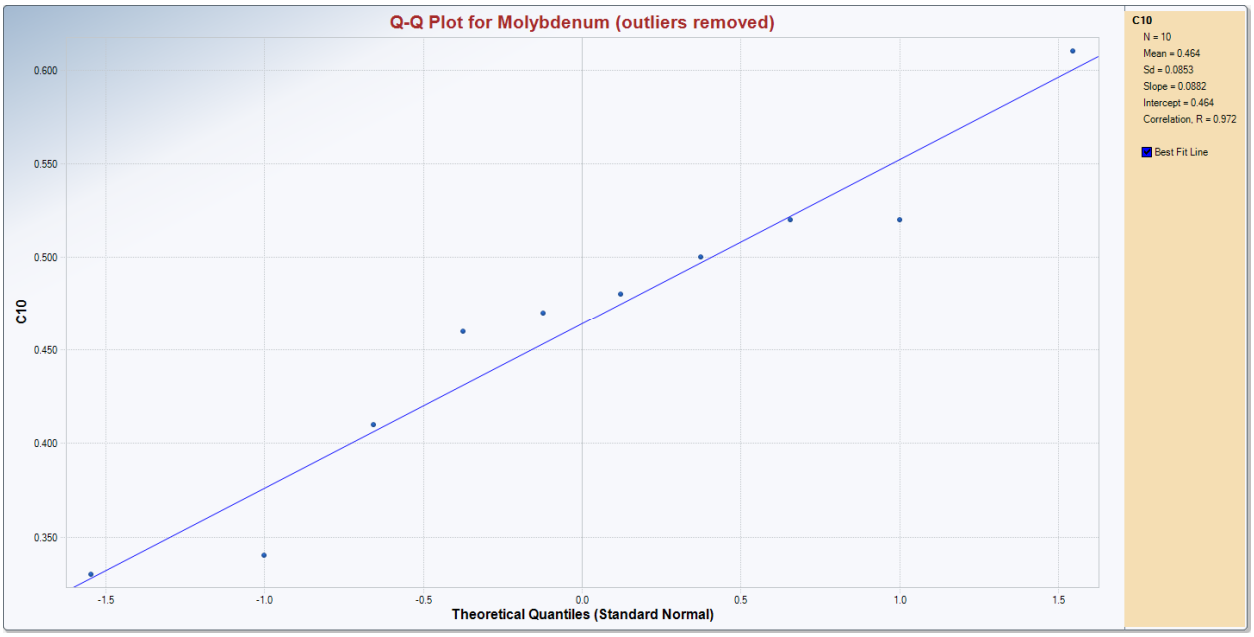


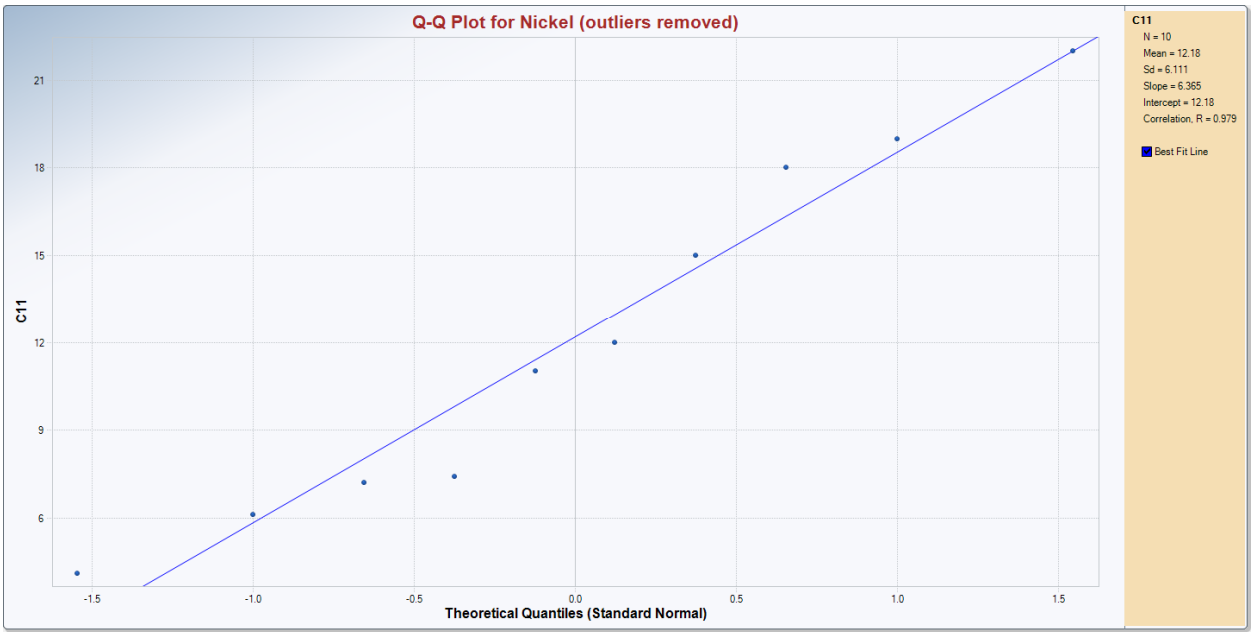
Metal-Specific Q-Q Plots (outliers removed)



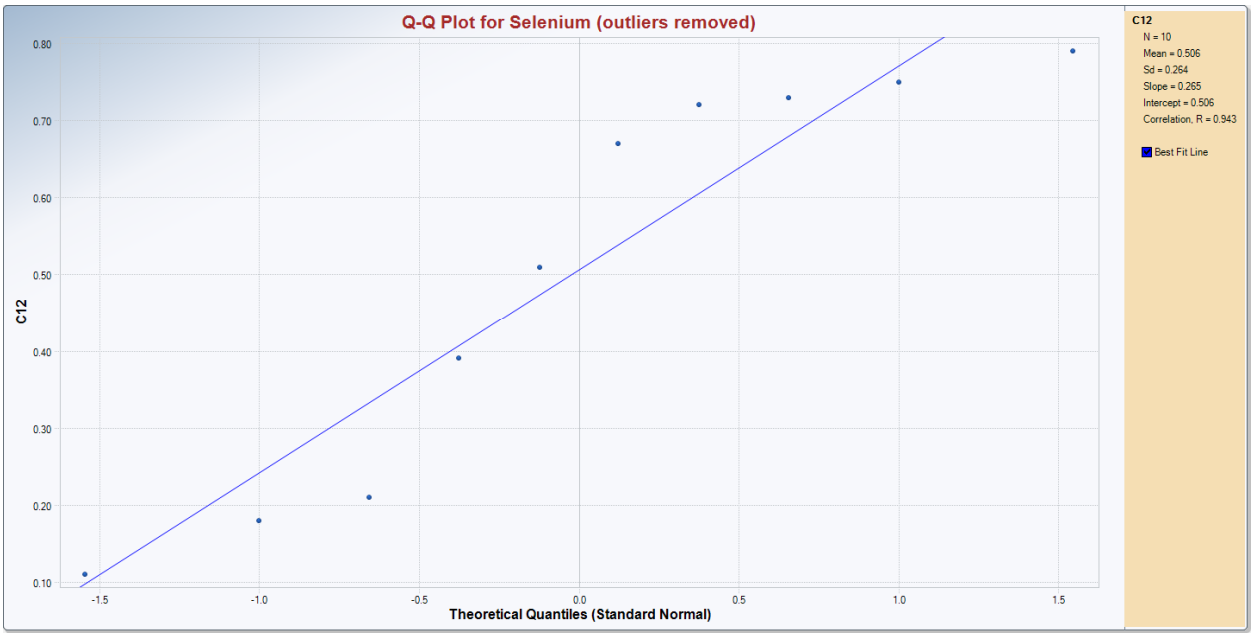


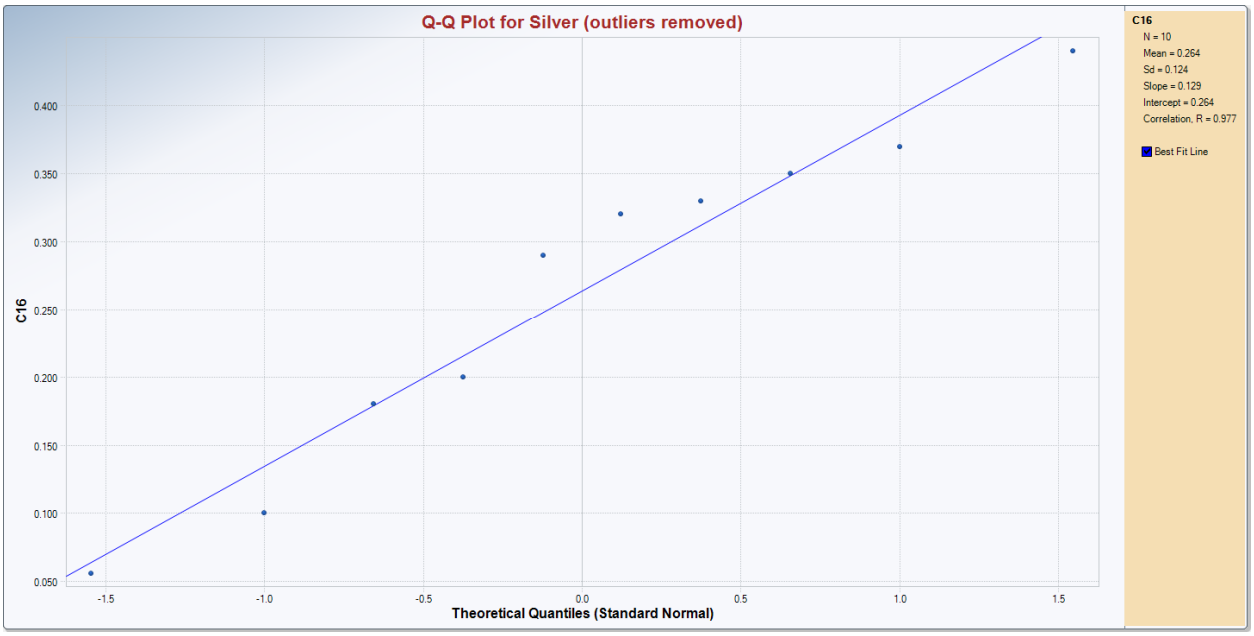
Metal-Specific Q-Q Plots (outliers removed)



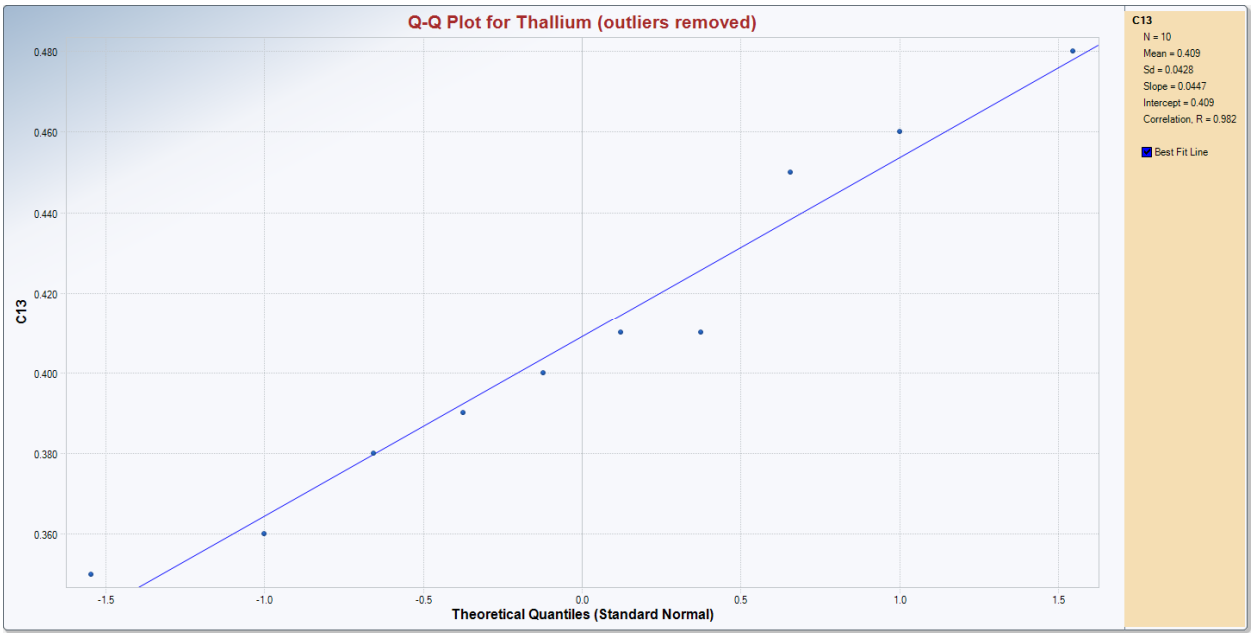


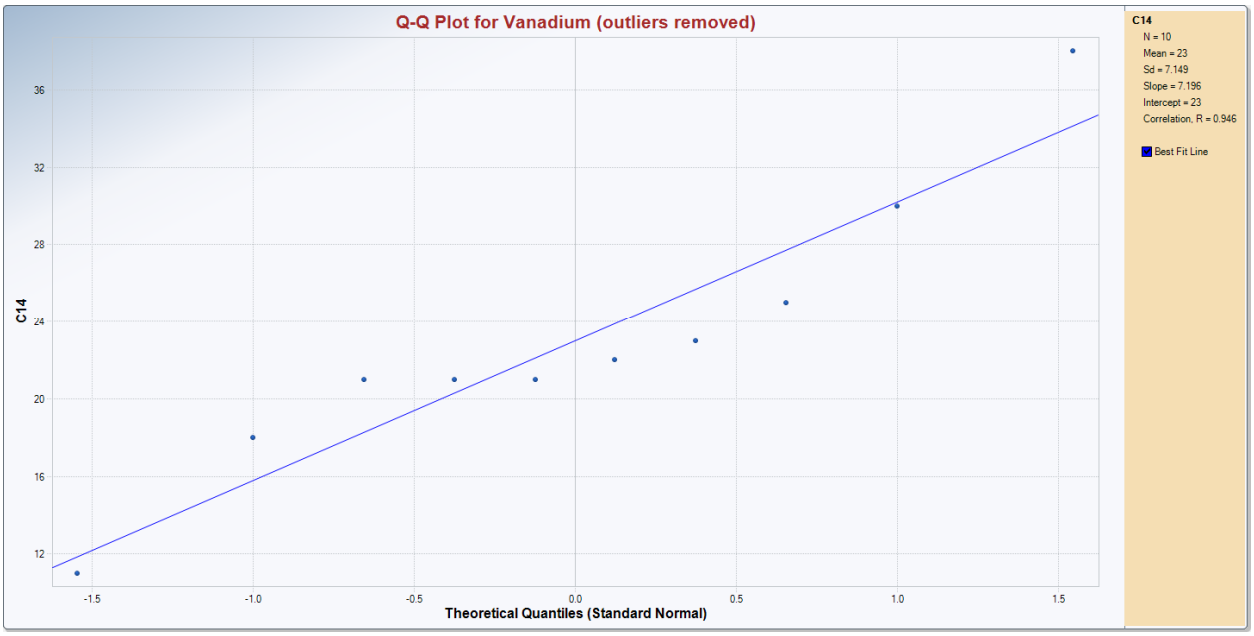
Metal-Specific Q-Q Plots (outliers removed)



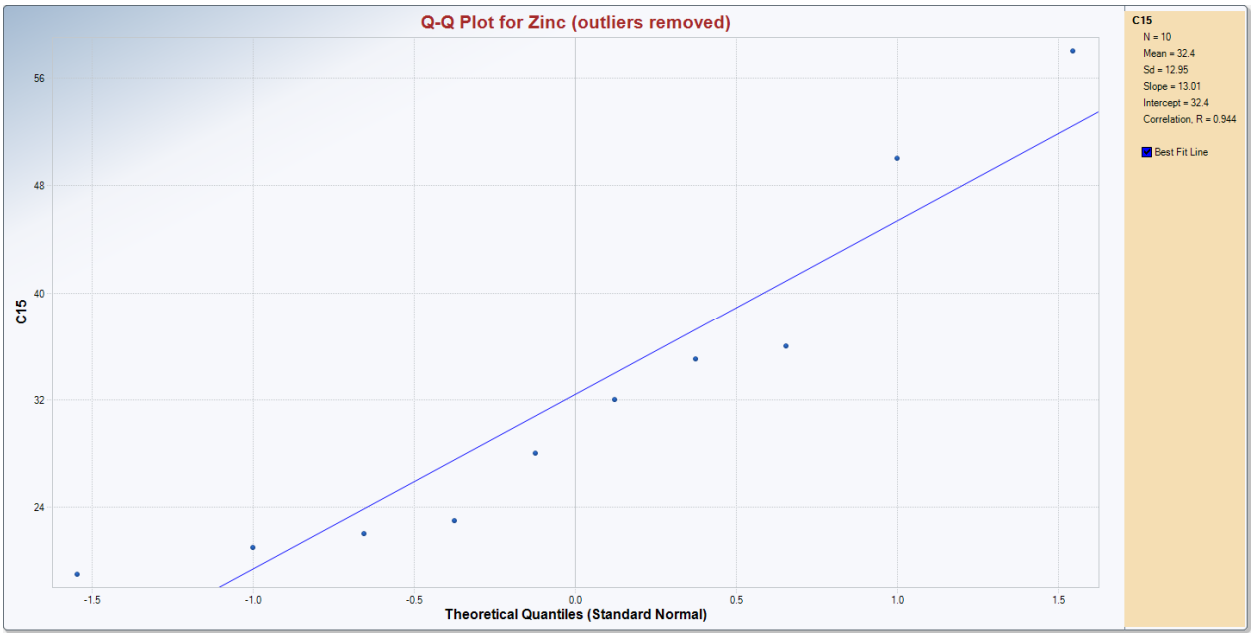


Metal-Specific Q-Q Plots (outliers removed)





Metal-Specific Q-Q Plots (outliers removed)



Statistical Analysis

User Selected Options	
Date/Time of Computation	7/16/2015 14:07
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

ANTIMONY

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
Minimum	0.077	First Quartile	0.11
Second Largest	0.4	Median	0.15
Maximum	0.45	Third Quartile	0.37
Mean	0.22	SD	0.147
Coefficient of Variation	0.67	Skewness	0.663
Mean of logged Data	-1.721	SD of logged Data	0.687

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.844	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.238	Lilliefors GOF Test
5% Lilliefors Critical Value	0.295	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.667	90% Percentile (z)	0.409
95% UPL (t)	0.509	95% Percentile (z)	0.463
95% USL	**0.531**	99% Percentile (z)	0.563

Gamma GOF Test

A-D Test Statistic	0.51	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.728	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.282	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.566	k star (bias corrected MLE)	1.785
Theta hat (MLE)	0.0858	Theta star (bias corrected MLE)	0.123
nu hat (MLE)	46.18	nu star (bias corrected)	32.12
MLE Mean (bias corrected)	0.22	MLE Sd (bias corrected)	0.165

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.59	90% Percentile	0.44
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.609	95% Percentile	0.541
95% WH Approx. Gamma UTL with 95% Coverage	0.947	99% Percentile	0.769
95% HW Approx. Gamma UTL with 95% Coverage	1.023		
95% WH USL	0.633	95% HW USL	0.657

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.899	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.188	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.295	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.436	90% Percentile (z)	0.432
95% UPL (t)	0.688	95% Percentile (z)	0.554
95% USL	0.762	99% Percentile (z)	0.885

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9	95% UTL with 95% Coverage	0.45
Approximate f	0.474	Confidence Coefficient (CC) achieved by UTL	0.37
95% Percentile Bootstrap UTL with 95% Coverage	0.45	95% BCA Bootstrap UTL with 95% Coverage	0.45
95% UPL	0.45	90% Percentile	0.41
90% Chebyshev UPL	0.686	95% Percentile	0.43
95% Chebyshev UPL	0.897	99% Percentile	0.446
95% USL	0.45		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

ARSENIC

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8
Minimum	3.9	First Quartile	4.9
Second Largest	11	Median	5.6
Maximum	12	Third Quartile	9
Mean	6.922	SD	3.045
Coefficient of Variation	0.44	Skewness	0.774
Mean of logged Data	1.853	SD of logged Data	0.425

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.875	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.224	Lilliefors GOF Test
5% Lilliefors Critical Value	0.295	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	16.15	90% Percentile (z)	10.82
95% UPL (t)	12.89	95% Percentile (z)	11.93
95% USL	**13.34**	99% Percentile (z)	14

Gamma GOF Test

A-D Test Statistic	0.419	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.723	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.202	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.28	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.26	k star (bias corrected MLE)	4.248
Theta hat (MLE)	1.106	Theta star (bias corrected MLE)	1.63
nu hat (MLE)	112.7	nu star (bias corrected)	76.46
MLE Mean (bias corrected)	6.922	MLE Sd (bias corrected)	3.359

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	13.82	90% Percentile	11.42
95% Hawkins Wixley (HW) Approx. Gamma UPL	14	95% Percentile	13.21
95% WH Approx. Gamma UTL with 95% Coverage	19.44	99% Percentile	17.01
95% HW Approx. Gamma UTL with 95% Coverage	20.14		
95% WH USL	14.53	95% HW USL	14.76

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.912	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.176	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.295	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	23.09	90% Percentile (z)	10.99
95% UPL (t)	14.66	95% Percentile (z)	12.82
95% USL	15.62	99% Percentile (z)	17.12

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9	95% UTL with 95% Coverage	12
Approximate f	0.474	Confidence Coefficient (CC) achieved by UTL	0.37
95% Percentile Bootstrap UTL with 95% Coverage	12	95% BCA Bootstrap UTL with 95% Coverage	12
95% UPL	12	90% Percentile	11.2
90% Chebyshev UPL	16.55	95% Percentile	11.6
95% Chebyshev UPL	20.91	99% Percentile	11.92
95% USL	12		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

BARIUM

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	80	First Quartile	94
Second Largest	230	Median	135
Maximum	240	Third Quartile	195
Mean	147.5	SD	61.46
Coefficient of Variation	0.417	Skewness	0.393
Mean of logged Data	4.914	SD of logged Data	0.425

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.894	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.18	Lilliefors GOF Test
5% Lilliefors Critical Value	0.28	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	326.4	90% Percentile (z)	226.3
95% UPL (t)	265.7	95% Percentile (z)	248.6
95% USL	**281.2**	99% Percentile (z)	290.5

Gamma GOF Test

A-D Test Statistic	0.425	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.728	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.184	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.394	k star (bias corrected MLE)	4.542
Theta hat (MLE)	23.07	Theta star (bias corrected MLE)	32.47
nu hat (MLE)	127.9	nu star (bias corrected)	90.85
MLE Mean (bias corrected)	147.5	MLE Sd (bias corrected)	69.21

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	288.1	90% Percentile	240.2
95% Hawkins Wixley (HW) Approx. Gamma UPL	292.3	95% Percentile	276.6
95% WH Approx. Gamma UTL with 95% Coverage	394.2	99% Percentile	353.9
95% HW Approx. Gamma UTL with 95% Coverage	408.5		
95% WH USL	313.2	95% HW USL	319.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.906	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.166	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	468.8	90% Percentile (z)	234.6
95% UPL (t)	308.1	95% Percentile (z)	273.8
95% USL	343.1	99% Percentile (z)	365.7

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	240
Approximate f	0.526	Confidence Coefficient (CC) achieved by UTL	0.401
95% Percentile Bootstrap UTL with 95% Coverage	240	95% BCA Bootstrap UTL with 95% Coverage	240
95% UPL	240	90% Percentile	231
90% Chebyshev UPL	340.9	95% Percentile	235.5
95% Chebyshev UPL	428.5	99% Percentile	239.1
95% USL	240		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

BERYLLIUM

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Minimum	0.076	First Quartile	0.0818
Second Largest	0.11	Median	0.091
Maximum	0.11	Third Quartile	0.0995
Mean	0.0921	SD	0.0128
Coefficient of Variation	0.139	Skewness	0.438
Mean of logged Data	-2.393	SD of logged Data	0.138

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.187	d2max (for USL)	2.032

Normal GOF Test

Shapiro Wilk Test Statistic	0.913	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.168	Lilliefors GOF Test
5% Lilliefors Critical Value	0.313	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.133	90% Percentile (z)	0.109
95% UPL (t)	0.118	95% Percentile (z)	0.113
95% USL	**0.118**	99% Percentile (z)	0.122

Gamma GOF Test

A-D Test Statistic	0.324	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.715	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.178	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.293	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	60.11	k star (bias corrected MLE)	37.65
Theta hat (MLE)	0.00153	Theta star (bias corrected MLE)	0.00245
nu hat (MLE)	961.8	nu star (bias corrected)	602.5
MLE Mean (bias corrected)	0.0921	MLE Sd (bias corrected)	0.015

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.119	90% Percentile	0.112
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.12	95% Percentile	0.118
95% WH Approx. Gamma UTL with 95% Coverage	0.138	99% Percentile	0.131
95% HW Approx. Gamma UTL with 95% Coverage	0.139		
95% WH USL	0.12	95% HW USL	0.12

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.928	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.161	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.313	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.142	90% Percentile (z)	0.109
95% UPL (t)	0.12	95% Percentile (z)	0.115
95% USL	0.121	99% Percentile (z)	0.126

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	8	95% UTL with 95% Coverage	0.11
Approximate f	0.421	Confidence Coefficient (CC) achieved by UTL	0.337
95% Percentile Bootstrap UTL with 95% Coverage	0.11	95% BCA Bootstrap UTL with 95% Coverage	0.11
95% UPL	0.11	90% Percentile	0.11
90% Chebyshev UPL	0.133	95% Percentile	0.11
95% Chebyshev UPL	0.151	99% Percentile	0.11
95% USL	0.11		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

CADMIUM

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
Minimum	0.049	First Quartile	0.0613
Second Largest	0.13	Median	0.105
Maximum	0.15	Third Quartile	0.118
Mean	0.0949	SD	0.0355
Coefficient of Variation	0.374	Skewness	-0.0367
Mean of logged Data	-2.426	SD of logged Data	0.409

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.924	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.165	Lilliefors GOF Test
5% Lilliefors Critical Value	0.28	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.198	90% Percentile (z)	0.14
95% UPL (t)	0.163	95% Percentile (z)	0.153
95% USL	**0.172**	99% Percentile (z)	0.178

Gamma GOF Test

A-D Test Statistic	0.48	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.728	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.205	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.208	k star (bias corrected MLE)	5.112
Theta hat (MLE)	0.0132	Theta star (bias corrected MLE)	0.0186
nu hat (MLE)	144.2	nu star (bias corrected)	102.2
MLE Mean (bias corrected)	0.0949	MLE Sd (bias corrected)	0.042

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.179	90% Percentile	0.151
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.183	95% Percentile	0.173
95% WH Approx. Gamma UTL with 95% Coverage	0.242	99% Percentile	0.219
95% HW Approx. Gamma UTL with 95% Coverage	0.251		
95% WH USL	0.194	95% HW USL	0.199

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.897	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.218	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.291	90% Percentile (z)	0.149
95% UPL (t)	0.194	95% Percentile (z)	0.173
95% USL	0.215	99% Percentile (z)	0.229

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	0.15
Approximate f	0.526	Confidence Coefficient (CC) achieved by UTL	0.401
95% Percentile Bootstrap UTL with 95% Coverage	0.15	95% BCA Bootstrap UTL with 95% Coverage	0.15
95% UPL	0.15	90% Percentile	0.132
90% Chebyshev UPL	0.207	95% Percentile	0.141
95% Chebyshev UPL	0.257	99% Percentile	0.148
95% USL	0.15		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

CHROMIUM

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	3	First Quartile	5.175
Second Largest	9	Median	6.35
Maximum	12	Third Quartile	7.175
Mean	6.54	SD	2.567
Coefficient of Variation	0.392	Skewness	0.912
Mean of logged Data	1.809	SD of logged Data	0.395

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.946	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.184	Lilliefors GOF Test
5% Lilliefors Critical Value	0.28	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	14.01	90% Percentile (z)	9.829
95% UPL (t)	11.47	95% Percentile (z)	10.76
95% USL	**12.12**	99% Percentile (z)	12.51

Gamma GOF Test

A-D Test Statistic	0.175	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.727	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.135	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.434	k star (bias corrected MLE)	5.271
Theta hat (MLE)	0.88	Theta star (bias corrected MLE)	1.241
nu hat (MLE)	148.7	nu star (bias corrected)	105.4
MLE Mean (bias corrected)	6.54	MLE Sd (bias corrected)	2.849

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	12.25	90% Percentile	10.35
95% Hawkins Wixley (HW) Approx. Gamma UPL	12.41	95% Percentile	11.82
95% WH Approx. Gamma UTL with 95% Coverage	16.45	99% Percentile	14.91
95% HW Approx. Gamma UTL with 95% Coverage	17		
95% WH USL	13.25	95% HW USL	13.49

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.984	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.131	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	19.3	90% Percentile (z)	10.13
95% UPL (t)	13.06	95% Percentile (z)	11.7
95% USL	14.43	99% Percentile (z)	15.32

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	12
Approximate f	0.526	Confidence Coefficient (CC) achieved by UTL	0.401
95% Percentile Bootstrap UTL with 95% Coverage	12	95% BCA Bootstrap UTL with 95% Coverage	12
95% UPL	12	90% Percentile	9.3
90% Chebyshev UPL	14.62	95% Percentile	10.65
95% Chebyshev UPL	18.27	99% Percentile	11.73
95% USL	12		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

COBALT

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	1.9	First Quartile	2.975
Second Largest	5.4	Median	3.65
Maximum	7	Third Quartile	4.65
Mean	3.92	SD	1.505
Coefficient of Variation	0.384	Skewness	0.838
Mean of logged Data	1.301	SD of logged Data	0.382

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.96	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.132	Lilliefors GOF Test
5% Lilliefors Critical Value	0.28	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	8.3	90% Percentile (z)	5.848
95% UPL (t)	6.813	95% Percentile (z)	6.395
95% USL	**7.194**	99% Percentile (z)	7.42

Gamma GOF Test

A-D Test Statistic	0.105	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.727	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0868	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.842	k star (bias corrected MLE)	5.556
Theta hat (MLE)	0.5	Theta star (bias corrected MLE)	0.706
nu hat (MLE)	156.8	nu star (bias corrected)	111.1
MLE Mean (bias corrected)	3.92	MLE Sd (bias corrected)	1.663

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	7.242	90% Percentile	6.145
95% Hawkins Wixley (HW) Approx. Gamma UPL	7.328	95% Percentile	6.995
95% WH Approx. Gamma UTL with 95% Coverage	9.668	99% Percentile	8.782
95% HW Approx. Gamma UTL with 95% Coverage	9.96		
95% WH USL	7.82	95% HW USL	7.946

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.999	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0682	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	11.17	90% Percentile (z)	5.994
95% UPL (t)	7.659	95% Percentile (z)	6.887
95% USL	8.438	99% Percentile (z)	8.937

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	7
Approximate f	0.526	Confidence Coefficient (CC) achieved by UTL	0.401
95% Percentile Bootstrap UTL with 95% Coverage	7	95% BCA Bootstrap UTL with 95% Coverage	7
95% UPL	7	90% Percentile	5.56
90% Chebyshev UPL	8.654	95% Percentile	6.28
95% Chebyshev UPL	10.8	99% Percentile	6.856
95% USL	7		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

COPPER

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8
Minimum	3.8	First Quartile	5.8
Second Largest	10	Median	6.9
Maximum	12	Third Quartile	9.9
Mean	7.433	SD	2.658
Coefficient of Variation	0.358	Skewness	0.53
Mean of logged Data	1.949	SD of logged Data	0.362

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.936	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.187	Lilliefors GOF Test
5% Lilliefors Critical Value	0.295	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	15.49	90% Percentile (z)	10.84
95% UPL (t)	12.64	95% Percentile (z)	11.8
95% USL	**13.04**	99% Percentile (z)	13.62

Gamma GOF Test

A-D Test Statistic	0.294	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.722	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.176	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.279	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	8.864	k star (bias corrected MLE)	5.983
Theta hat (MLE)	0.839	Theta star (bias corrected MLE)	1.242
nu hat (MLE)	159.5	nu star (bias corrected)	107.7
MLE Mean (bias corrected)	7.433	MLE Sd (bias corrected)	3.039

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	13.51	90% Percentile	11.5
95% Hawkins Wixley (HW) Approx. Gamma UPL	13.67	95% Percentile	13.03
95% WH Approx. Gamma UTL with 95% Coverage	18.19	99% Percentile	16.25
95% HW Approx. Gamma UTL with 95% Coverage	18.75		
95% WH USL	14.11	95% HW USL	14.31

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.96	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.162	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.295	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	21.06	90% Percentile (z)	11.17
95% UPL (t)	14.28	95% Percentile (z)	12.74
95% USL	15.08	99% Percentile (z)	16.31

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9	95% UTL with 95% Coverage	12
Approximate f	0.474	Confidence Coefficient (CC) achieved by UTL	0.37
95% Percentile Bootstrap UTL with 95% Coverage	12	95% BCA Bootstrap UTL with 95% Coverage	12
95% UPL	12	90% Percentile	10.4
90% Chebyshev UPL	15.84	95% Percentile	11.2
95% Chebyshev UPL	19.64	99% Percentile	11.84
95% USL	12		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

LEAD

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
Minimum	6.1	First Quartile	8.075
Second Largest	9.5	Median	9
Maximum	10	Third Quartile	9.5
Mean	8.525	SD	1.441
Coefficient of Variation	0.169	Skewness	-1.099
Mean of logged Data	2.129	SD of logged Data	0.185

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.187	d2max (for USL)	2.032

Normal GOF Test

Shapiro Wilk Test Statistic	0.832	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.271	Lilliefors GOF Test
5% Lilliefors Critical Value	0.313	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	13.12	90% Percentile (z)	10.37
95% UPL (t)	11.42	95% Percentile (z)	10.9
95% USL	**11.45**	99% Percentile (z)	11.88

Gamma GOF Test

A-D Test Statistic	0.801	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.715	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.293	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.294	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	35.67	k star (bias corrected MLE)	22.37
Theta hat (MLE)	0.239	Theta star (bias corrected MLE)	0.381
nu hat (MLE)	570.7	nu star (bias corrected)	358
MLE Mean (bias corrected)	8.525	MLE Sd (bias corrected)	1.802

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	11.88	90% Percentile	10.9
95% Hawkins Wixley (HW) Approx. Gamma UPL	11.95	95% Percentile	11.69
95% WH Approx. Gamma UTL with 95% Coverage	14.26	99% Percentile	13.27
95% HW Approx. Gamma UTL with 95% Coverage	14.46		
95% WH USL	11.92	95% HW USL	11.99

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.802	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.818	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.299	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.313	Data appear Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	15.15	90% Percentile (z)	10.65
95% UPL (t)	12.19	95% Percentile (z)	11.39
95% USL	12.24	99% Percentile (z)	12.92

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	8	95% UTL with 95% Coverage	10
Approximate f	0.421	Confidence Coefficient (CC) achieved by UTL	0.337
95% Percentile Bootstrap UTL with 95% Coverage	10	95% BCA Bootstrap UTL with 95% Coverage	10
95% UPL	10	90% Percentile	9.65
90% Chebyshev UPL	13.11	95% Percentile	9.825
95% Chebyshev UPL	15.19	99% Percentile	9.965
95% USL	10		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

MERCURY

General Statistics

Total Number of Observations	7	Number of Distinct Observations	6
Minimum	0.17	First Quartile	0.22
Second Largest	0.32	Median	0.24
Maximum	0.39	Third Quartile	0.32
Mean	0.269	SD	0.0769
Coefficient of Variation	0.286	Skewness	0.422
Mean of logged Data	-1.35	SD of logged Data	0.288

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.399	d2max (for USL)	1.938

Normal GOF Test

Shapiro Wilk Test Statistic	0.945	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.216	Lilliefors GOF Test
5% Lilliefors Critical Value	0.335	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.53	90% Percentile (z)	0.367
95% UPL (t)	0.428	95% Percentile (z)	0.395
95% USL	**0.418**	99% Percentile (z)	0.447

Gamma GOF Test

A-D Test Statistic	0.279	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.708	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.208	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.312	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	14.31	k star (bias corrected MLE)	8.273
Theta hat (MLE)	0.0188	Theta star (bias corrected MLE)	0.0325
nu hat (MLE)	200.4	nu star (bias corrected)	115.8
MLE Mean (bias corrected)	0.269	MLE Sd (bias corrected)	0.0934

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.453	90% Percentile	0.393
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.457	95% Percentile	0.438
95% WH Approx. Gamma UTL with 95% Coverage	0.612	99% Percentile	0.532
95% HW Approx. Gamma UTL with 95% Coverage	0.628		
95% WH USL	0.438	95% HW USL	0.441

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.96	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.196	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.335	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.69	90% Percentile (z)	0.375
95% UPL (t)	0.472	95% Percentile (z)	0.416
95% USL	0.453	99% Percentile (z)	0.507

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	7	95% UTL with 95% Coverage	0.39
Approximate f	0.368	Confidence Coefficient (CC) achieved by UTL	0.302
95% Percentile Bootstrap UTL with 95% Coverage	0.39	95% BCA Bootstrap UTL with 95% Coverage	0.39
95% UPL	0.39	90% Percentile	0.348
90% Chebyshev UPL	0.515	95% Percentile	0.369
95% Chebyshev UPL	0.627	99% Percentile	0.386
95% USL	0.39		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

MOLYBDENUM

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
Minimum	0.33	First Quartile	0.423
Second Largest	0.52	Median	0.475
Maximum	0.61	Third Quartile	0.515
Mean	0.464	SD	0.0853
Coefficient of Variation	0.184	Skewness	-0.214
Mean of logged Data	-0.784	SD of logged Data	0.192

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.946	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.181	Lilliefors GOF Test
5% Lilliefors Critical Value	0.28	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.712	90% Percentile (z)	0.573
95% UPL (t)	0.628	95% Percentile (z)	0.604
95% USL	**0.65**	99% Percentile (z)	0.662

Gamma GOF Test

A-D Test Statistic	0.402	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.724	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.205	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	31.19	k star (bias corrected MLE)	21.9
Theta hat (MLE)	0.0149	Theta star (bias corrected MLE)	0.0212
nu hat (MLE)	623.7	nu star (bias corrected)	438
MLE Mean (bias corrected)	0.464	MLE Sd (bias corrected)	0.0992

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.647	90% Percentile	0.595
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.651	95% Percentile	0.638
95% WH Approx. Gamma UTL with 95% Coverage	0.762	99% Percentile	0.725
95% HW Approx. Gamma UTL with 95% Coverage	0.77		
95% WH USL	0.676	95% HW USL	0.68

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.922	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.215	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.799	90% Percentile (z)	0.584
95% UPL (t)	0.661	95% Percentile (z)	0.627
95% USL	0.694	99% Percentile (z)	0.714

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	0.61
Approximate f	0.526	Confidence Coefficient (CC) achieved by UTL	0.401
95% Percentile Bootstrap UTL with 95% Coverage	0.61	95% BCA Bootstrap UTL with 95% Coverage	0.61
95% UPL	0.61	90% Percentile	0.529
90% Chebyshev UPL	0.732	95% Percentile	0.57
95% Chebyshev UPL	0.854	99% Percentile	0.602
95% USL	0.61		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

NICKEL

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	4.1	First Quartile	7.25
Second Largest	19	Median	11.5
Maximum	22	Third Quartile	17.25
Mean	12.18	SD	6.111
Coefficient of Variation	0.502	Skewness	0.303
Mean of logged Data	2.371	SD of logged Data	0.555

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.943	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.183	Lilliefors GOF Test
5% Lilliefors Critical Value	0.28	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	29.97	90% Percentile (z)	20.01
95% UPL (t)	23.93	95% Percentile (z)	22.23
95% USL	**25.48**	99% Percentile (z)	26.4

Gamma GOF Test

A-D Test Statistic	0.263	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.729	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.174	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.268	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.046	k star (bias corrected MLE)	2.899
Theta hat (MLE)	3.01	Theta star (bias corrected MLE)	4.202
nu hat (MLE)	80.92	nu star (bias corrected)	57.98
MLE Mean (bias corrected)	12.18	MLE Sd (bias corrected)	7.154

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	27.32	90% Percentile	21.77
95% Hawkins Wixley (HW) Approx. Gamma UPL	28.05	95% Percentile	25.82
95% WH Approx. Gamma UTL with 95% Coverage	39.63	99% Percentile	34.6
95% HW Approx. Gamma UTL with 95% Coverage	42.06		
95% WH USL	30.19	95% HW USL	31.25

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.95	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.147	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	53.95	90% Percentile (z)	21.82
95% UPL (t)	31.16	95% Percentile (z)	26.7
95% USL	35.87	99% Percentile (z)	38.99

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	22
Approximate f	0.526	Confidence Coefficient (CC) achieved by UTL	0.401
95% Percentile Bootstrap UTL with 95% Coverage	22	95% BCA Bootstrap UTL with 95% Coverage	22
95% UPL	22	90% Percentile	19.3
90% Chebyshev UPL	31.41	95% Percentile	20.65
95% Chebyshev UPL	40.12	99% Percentile	21.73
95% USL	22		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

SELENIUM

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	0.11	First Quartile	0.255
Second Largest	0.75	Median	0.59
Maximum	0.79	Third Quartile	0.728
Mean	0.506	SD	0.264
Coefficient of Variation	0.522	Skewness	-0.463
Mean of logged Data	-0.866	SD of logged Data	0.714

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.863	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.233	Lilliefors GOF Test
5% Lilliefors Critical Value	0.28	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.274	90% Percentile (z)	0.844
95% UPL (t)	1.014	95% Percentile (z)	0.94
95% USL	**1.08**	99% Percentile (z)	1.12

Gamma GOF Test

A-D Test Statistic	0.737	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.733	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.255	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.269	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.855	k star (bias corrected MLE)	2.065
Theta hat (MLE)	0.177	Theta star (bias corrected MLE)	0.245
nu hat (MLE)	57.09	nu star (bias corrected)	41.3
MLE Mean (bias corrected)	0.506	MLE Sd (bias corrected)	0.352

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.28	90% Percentile	0.977
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.345	95% Percentile	1.188
95% WH Approx. Gamma UTL with 95% Coverage	1.951	99% Percentile	1.656
95% HW Approx. Gamma UTL with 95% Coverage	2.151		
95% WH USL	1.434	95% HW USL	1.526

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.832	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.842	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.243	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	3.359	90% Percentile (z)	1.05
95% UPL (t)	1.659	95% Percentile (z)	1.36
95% USL	1.988	99% Percentile (z)	2.213

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	0.79
Approximate f	0.526	Confidence Coefficient (CC) achieved by UTL	0.401
95% Percentile Bootstrap UTL with 95% Coverage	0.79	95% BCA Bootstrap UTL with 95% Coverage	0.79
95% UPL	0.79	90% Percentile	0.754
90% Chebyshev UPL	1.337	95% Percentile	0.772
95% Chebyshev UPL	1.713	99% Percentile	0.786
95% USL	0.79		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

SILVER

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	0.056	First Quartile	0.185
Second Largest	0.37	Median	0.305
Maximum	0.44	Third Quartile	0.345
Mean	0.264	SD	0.124
Coefficient of Variation	0.472	Skewness	-0.458
Mean of logged Data	-1.486	SD of logged Data	0.657

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.946	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.184	Lilliefors GOF Test
5% Lilliefors Critical Value	0.28	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.625	90% Percentile (z)	0.423
95% UPL (t)	0.503	95% Percentile (z)	0.468
95% USL	**0.534**	99% Percentile (z)	0.553

Gamma GOF Test

A-D Test Statistic	0.54	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.24	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.268	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.432	k star (bias corrected MLE)	2.469
Theta hat (MLE)	0.0768	Theta star (bias corrected MLE)	0.107
nu hat (MLE)	68.64	nu star (bias corrected)	49.38
MLE Mean (bias corrected)	0.264	MLE Sd (bias corrected)	0.168

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.625	90% Percentile	0.488
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.655	95% Percentile	0.586
95% WH Approx. Gamma UTL with 95% Coverage	0.926	99% Percentile	0.799
95% HW Approx. Gamma UTL with 95% Coverage	1.014		
95% WH USL	0.694	95% HW USL	0.736

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.854	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.247	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.531	90% Percentile (z)	0.525
95% UPL (t)	0.8	95% Percentile (z)	0.667
95% USL	0.945	99% Percentile (z)	1.043

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	0.44
Approximate f	0.526	Confidence Coefficient (CC) achieved by UTL	0.401
95% Percentile Bootstrap UTL with 95% Coverage	0.44	95% BCA Bootstrap UTL with 95% Coverage	0.44
95% UPL	0.44	90% Percentile	0.377
90% Chebyshev UPL	0.655	95% Percentile	0.409
95% Chebyshev UPL	0.832	99% Percentile	0.434
95% USL	0.44		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

THALLIUM

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
Minimum	0.35	First Quartile	0.383
Second Largest	0.46	Median	0.405
Maximum	0.48	Third Quartile	0.44
Mean	0.409	SD	0.0428
Coefficient of Variation	0.105	Skewness	0.362
Mean of logged Data	-0.899	SD of logged Data	0.104

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.953	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.191	Lilliefors GOF Test
5% Lilliefors Critical Value	0.28	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.534	90% Percentile (z)	0.464
95% UPL (t)	0.491	95% Percentile (z)	0.479
95% USL	**0.502**	99% Percentile (z)	0.509

Gamma GOF Test

A-D Test Statistic	0.251	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.724	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.177	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	102.7	k star (bias corrected MLE)	71.97
Theta hat (MLE)	0.00398	Theta star (bias corrected MLE)	0.00568
nu hat (MLE)	2054	nu star (bias corrected)	1439
MLE Mean (bias corrected)	0.409	MLE Sd (bias corrected)	0.0482

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.495	90% Percentile	0.472
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.495	95% Percentile	0.491
95% WH Approx. Gamma UTL with 95% Coverage	0.544	99% Percentile	0.529
95% HW Approx. Gamma UTL with 95% Coverage	0.546		
95% WH USL	0.507	95% HW USL	0.508

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.96	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.172	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.551	90% Percentile (z)	0.465
95% UPL (t)	0.497	95% Percentile (z)	0.483
95% USL	0.51	99% Percentile (z)	0.518

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	0.48
Approximate f	0.526	Confidence Coefficient (CC) achieved by UTL	0.401
95% Percentile Bootstrap UTL with 95% Coverage	0.48	95% BCA Bootstrap UTL with 95% Coverage	0.48
95% UPL	0.48	90% Percentile	0.462
90% Chebyshev UPL	0.544	95% Percentile	0.471
95% Chebyshev UPL	0.605	99% Percentile	0.478
95% USL	0.48		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

VANADIUM

General Statistics

Total Number of Observations	10	Number of Distinct Observations	8
Minimum	11	First Quartile	21
Second Largest	30	Median	21.5
Maximum	38	Third Quartile	24.5
Mean	23	SD	7.149
Coefficient of Variation	0.311	Skewness	0.702
Mean of logged Data	3.091	SD of logged Data	0.323

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.921	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.2	Lilliefors GOF Test
5% Lilliefors Critical Value	0.28	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	43.81	90% Percentile (z)	32.16
95% UPL (t)	36.74	95% Percentile (z)	34.76
95% USL	**38.56**	99% Percentile (z)	39.63

Gamma GOF Test

A-D Test Statistic	0.456	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.22	Kolmogrov-Smirnoff Gamma GOF Test
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	11.3	k star (bias corrected MLE)	7.978
Theta hat (MLE)	2.035	Theta star (bias corrected MLE)	2.883
nu hat (MLE)	226	nu star (bias corrected)	159.6
MLE Mean (bias corrected)	23	MLE Sd (bias corrected)	8.143

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	38.86	90% Percentile	33.86
95% Hawkins Wixley (HW) Approx. Gamma UPL	39.29	95% Percentile	37.82
95% WH Approx. Gamma UTL with 95% Coverage	49.86	99% Percentile	46.04
95% HW Approx. Gamma UTL with 95% Coverage	51.14		
95% WH USL	41.51	95% HW USL	42.11

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.919	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.243	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	56.35	90% Percentile (z)	33.28
95% UPL (t)	40.94	95% Percentile (z)	37.42
95% USL	44.43	99% Percentile (z)	46.65

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	38
Approximate f	0.526	Confidence Coefficient (CC) achieved by UTL	0.401
95% Percentile Bootstrap UTL with 95% Coverage	38	95% BCA Bootstrap UTL with 95% Coverage	38
95% UPL	38	90% Percentile	30.8
90% Chebyshev UPL	45.49	95% Percentile	34.4
95% Chebyshev UPL	55.68	99% Percentile	37.28
95% USL	38		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Statistical Analysis

ZINC

General Statistics			
Total Number of Observations	10	Number of Distinct Observations	10
Minimum	19	First Quartile	22.25
Second Largest	50	Median	30
Maximum	58	Third Quartile	35.75
Mean	32.4	SD	12.95
Coefficient of Variation	0.4	Skewness	1.045
Mean of logged Data	3.412	SD of logged Data	0.375
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176
Normal GOF Test			
Shapiro Wilk Test Statistic	0.885	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.191	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.28	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	70.11	90% Percentile (z)	49
95% UPL (t)	57.31	95% Percentile (z)	53.71
95% USL	**60.59**	99% Percentile (z)	62.54
Gamma GOF Test			
A-D Test Statistic	0.361	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.727	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.183	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	7.775	k star (bias corrected MLE)	5.509
Theta hat (MLE)	4.167	Theta star (bias corrected MLE)	5.881
nu hat (MLE)	155.5	nu star (bias corrected)	110.2
MLE Mean (bias corrected)	32.4	MLE Sd (bias corrected)	13.8
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	59.97	90% Percentile	50.87
95% Hawkins Wixley (HW) Approx. Gamma UPL	60.48	95% Percentile	57.93
95% WH Approx. Gamma UTL with 95% Coverage	80.16	99% Percentile	72.78
95% HW Approx. Gamma UTL with 95% Coverage	82.19		
95% WH USL	64.78	95% HW USL	65.58
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.17	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	90.28	90% Percentile (z)	49.03
95% UPL (t)	62.34	95% Percentile (z)	56.18
95% USL	68.55	99% Percentile (z)	72.52
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	10	95% UTL with 95% Coverage	58
Approximate f	0.526	Confidence Coefficient (CC) achieved by UTL	0.401
95% Percentile Bootstrap UTL with 95% Coverage	58	95% BCA Bootstrap UTL with 95% Coverage	58
95% UPL	58	90% Percentile	50.8
90% Chebyshev UPL	73.16	95% Percentile	54.4
95% Chebyshev UPL	91.62	99% Percentile	57.28
95% USL	58		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Appendix F. Streamlined Human Health Risk Assessment

This risk assessment was conducted on behalf of ERRG
by Jim Van de Water, Principal Hydrogeologist, Thomas Harder & Company.

(Due to size, this appendix is provided on CD only.)

Streamlined Human Health Risk Assessment

This streamlined human health risk assessment (HHRA) summarizes the potential risks to human health from exposure to metals in soil and sediments at the Mammoth Mining Company Stamp Mill Site. The following metals were considered:

- Antimony (Sb)
- Arsenic (As)
- Barium (Ba)
- Beryllium (Be)
- Cadmium (Cd)
- Chromium (Cr)
- Cobalt (Co)
- Copper (Cu)
- Lead (Pb)
- Mercury (Hg)
- Molybdenum (Mo)
- Nickel (Ni)
- Selenium (Se)
- Silver (Ag)
- Thallium (Tl)
- Vanadium (V)
- Zinc (Zn)

Essential nutrients (i.e., calcium, iron, magnesium, potassium, and sodium), as identified in U.S. Environmental Protection Agency (EPA) guidance (EPA, 1989)[1], were not considered in this streamlined HHRA.

The data herein are deemed complete and usable with no data gaps based on the site-wide coverage provided by these samples, sample depths, the field sampling collection and sample control methods, the comprehensive list of metals tested, the analytical methods used and the reporting limits achieved by the state-certified (Environmental Laboratory Accreditation Program)[2] laboratory, and associated laboratory quality control data.

[1] EPA, 1989. "Risk Assessment Guidance for Superfund (RAGS), Volume I Human Health Evaluation Manual (Part A)." Office of Emergency and Remedial Response. December.

[2] Environmental Laboratory Accreditation Program (administered by the California State Water Resources Control Board).

OVERVIEW

The streamlined HHRA is used to characterize potential risks, which may be used to develop removal action alternatives to reduce risk, as deemed necessary by the risk manager (i.e., the U.S. Department of Agriculture Forest Service [Forest Service]). Accordingly, the potential risks to human receptors from exposure to metals were evaluated by calculating risk values (i.e., incremental lifetime cancer risks [ILCR] values and noncancer hazard index [HI] values). The risk management criteria set forth in Bureau of Land Management (BLM) guidance (BLM, 2004)[3] are as follows:

- ILCR = 1×10^{-5} (also expressed as 1E-05)
- HI = 1.0 (also expressed as 1E+00)

The ILCR of 1E-05 means that there is only a 1-in-100,000 chance (0.001%) that a receptor would develop any type of cancer in a lifetime as a result of exposure to metals of concern at the site. Put another way, a risk manager would expect there to be 1 occurrence of cancer per 100,000 receptors exposed to metals at the site. An HI less than or equal to 1E+00 means that exposure to metals at the site by a receptor would not result in any adverse noncancer health effects. BLM (2004) sets forth the following risk management ranges:

Risk Management Range	ILCR	HI
Less than criteria: low risk	ILCR < 1E-05	HI < 1E+00
1-10 times the criteria: moderate risk	1E-05 ≤ ILCR ≤1E-04	1E+00 ≤ HI ≤1E+01
10-100 times the criteria: high risk	1E-04 < ILCR ≤1E-03	1E+01 < HI ≤ 1E+02
>100 times the criteria: extremely high risk	ILCR > 1E-03	HI > 1E+02

Potential risks were evaluated for exposure to:

1. soil from the former mining operations; and
2. sediment in the onsite dry diversion trench and unnamed tributary to Mammoth Creek.

Four exposure areas were considered:

1. Mill Area;
2. Cabins Area;
3. Sediment Area (i.e., diversion trench and unnamed tributary); and
4. the entire site.

[3] BLM, 2004 (Dr. Karl L. Ford). Risk Management Criteria for Metals at BLM Mining Sites, National Science and Technology Center, Denver, Colorado, Technical Note 390 (revised), BLM/RS/ST-97/001+1703. October.

Four receptors were considered:

1. recreational user;
2. recreational cabin occupant;
3. construction worker; and
4. full-time resident.

CONCEPTUAL SITE MODEL

The identification of exposure pathways, environmental media of interest (i.e., exposure points), and chemicals of potential concern (COPCs) is supported by the conceptual site model (CSM) (EPA, 1989). Figure 1 shows the site-specific CSM on which the streamlined HHRA is based. As shown on the figure, the CSM identifies:

- primary source(s) and mechanism(s) for the chemical release;
- environmental transport media (i.e., the secondary source[s] and release mechanism[s]);
- a point of potential human contact with the media (i.e., migration pathways); and
- exposure pathway(s) (e.g., ingestion, dermal contact, and inhalation).

As shown on Figure 1, and consistent with ERRG (2015)[4], the following receptors are evaluated in this streamlined HHRA:

- current and future recreational user receptor (long-term [chronic] child and adult receptors);
- current and future recreational cabin occupant receptor (long-term [chronic] child and adult receptors);
- future construction (trench) worker receptor (short-term [subchronic] worker); and
- future full-time residential receptor (long-term [chronic] child and adult receptors).[5]

Figure 1 also shows the potential exposure pathways for all receptors to be:

- incidental ingestion of metals-impacted soil and sediment;
- dermal contact of metals-impacted soil and sediment; and
- inhalation of metals-impacted soil and sediment.

[4] ERRG, 2015. "Technical Memorandum for Preliminary Assessment/Site Inspection at Mammoth Mill, Inyo National Forest, Mono County, California." April 24.

[5] The site is located on the Inyo National Forest and land use is expected to remain recreational into the foreseeable future; however, a hypothetical future full-time residential receptor is included in this streamlined HHRA to provide a conservative analysis.

The tendency of metals to strongly sorb to soil and sediments, as evidenced by site-specific leachability (soluble precipitation leachability procedure) tests, suggest that it is highly unlikely that metals are migrating in the aqueous phase (i.e., via surface water and/or infiltration and subsequent percolation to groundwater); therefore, the exposure pathways associated with these primary release mechanisms are deemed incomplete. The absence of any reasonably perennial water body that could support water recreational activities (e.g., swimming and fishing) at the site also eliminates the surface water release mechanism and associated exposure pathways. Therefore, the only the exposure pathways evaluated in this streamlined HHRA are those associated with soil and sediment. BLM and EPA considered these exposure pathways in their development of risk-based concentrations in soil (BLM, 2004[6]; EPA, 2015a[7]).

SELECTION OF CHEMICALS OF POTENTIAL CONCERN

COPCs are those chemicals for which ILCR and HI values are quantified and risk is characterized in the streamlined HHRA.

As in the overview, the streamlined HHRA will assist in developing removal action alternatives to reduce risks posed by metals contamination in soil and sediment. Given this function, and because metals are naturally present in both media, a distinction must be made in the streamlined HHRA as to whether measured concentrations of metals reflect a man-made release resulting in "contaminated media" or naturally occurring (non-contaminated media) "background" concentrations (hereinafter referred to as background threshold values [BTVs]). To accomplish this, soil and sediment data collected during the PA/SI were screened against site-specific BTVs. The site-specific BTVs are based on a statistical analysis (EPA, 2013)[8] of metals concentrations in soil samples collected from areas of the site far removed and upslope/upstream from mining operations. As such, concentrations of metals in the background samples (summarized in Table 1) are interpreted to reflect naturally occurring background concentrations indicative of non-contaminated media. Metals detected in at least one soil and/or sediment sample at a concentration exceeding its BTV were retained as COPCs for evaluation in the streamlined HHRA, as shown in Table 1. The methodology used to establish the BTVs is summarized in the notes to Table 1. As shown in Table 1, all metals were retained as COPCs except for chromium, thallium, and vanadium.

RISK-BASED CONCENTRATIONS

Risk-based concentrations (RBCs) for all COPCs (except lead) were calculated using the same equations used by EPA to derive their regional screening levels (EPA, 2015b[9]), which are of the

[6] BLM, 2004 (Dr. Karl L. Ford). "Risk Management Criteria for Metals at BLM Mining Sites, National Science and Technology Center, Denver, Colorado, Technical Note 390 (revised), BLM/RS/ST-97/001+1703." October.

[7] EPA, 2015a. http://www.epa.gov/region9/superfund/prg/. June.

[8] EPA, 2013. "ProUCL Version 5.0.00 - Technical Guide, Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations." EPA/600/R-07/041. September.

[9] EPA, 2015b. http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/equations.htm. June.

same general form as risk management criteria set forth in BLM (2004)[10]. The RBCs were calculated for all receptors for the cancer endpoint (for the carcinogenic COPCs [arsenic, beryllium, cadmium, cobalt, and nickel] only) and noncancer endpoint using the exposure parameters listed in Table 2.

As described above, the cancer endpoint-based RBCs (ILCR-based RBCs) are based on a target ILCR of 1E-05 consistent with BLM (2004). Similarly, the noncancer endpoint-based RBCs (HI-based RBCs) are based on a target hazard quotient of 1E+00, also consistent with BLM (2004).

The RBC calculation worksheets are included in Attachment A (recreational user receptor), Attachment B (recreational cabin occupant receptor), Attachment C (construction worker receptor)[11], and Attachment D (residential receptor). Tables 4 through 7 summarize the RBCs for the receptors evaluated.

The RBC for lead was based on the California Environmental Protection Agency's (CalEPA) blood lead model (CalEPA, 2011)[12] using the same approach used by CalEPA to develop the California Human Health Screening Level for lead (CalEPA, 2009)[13]. It is noted that this approach is based on an increase in the blood lead concentration of 1 micrograms per deciliter (µg/dL), as opposed to the 10 µg/dL noted in BLM (2004). The blood level-based lead screening concentrations in soil (rounded to the nearest 10 milligrams per kilogram [mg/kg]) are as follows:

- Current and Future Recreational Receptor – 700 mg/kg
- Current and Future Recreational Cabin Occupant Receptor – 590 mg/kg
- Future Construction Worker Receptor – 320 mg/kg
- Future Full-Time Residential Receptor – 80 mg/kg

The blood lead model worksheets are included in Attachment E.

RISK CHARACTERIZATION

Consistent with Section 5.15.2 of EPA (2015a)[14], RBCs were used to estimate the total risk from multiple metals at the site. This methodology is often called the "sum-of-the-ratios" approach and is as follows:

[10] BLM, 2004 (Dr. Karl L. Ford). "Risk Management Criteria for Metals at BLM Mining Sites, National Science and Technology Center, Denver, Colorado, Technical Note 390 (revised), BLM/RS/ST-97/001+1703." October.

[11] Chronic toxicity criteria, as opposed to subchronic criteria, are conservatively used for the construction worker (subchronic or short-term) receptor.

[12] https://dtsc.ca.gov/AssessingRisk/LeadSpread8.cfm.

[13] http://oehha.ca.gov/media/downloads/crnr/leadchhsl091709.pdf

[14] EPA, 2015a. http://www.epa.gov/region9/superfund/prg/. June.

$$ILCR_{sample} = \left(\frac{C_{COPC_1}}{RBC_{C,COPC_1}} + \frac{C_{COPC_2}}{RBC_{C,COPC_2}} + ... + \frac{C_{COPC_n}}{RBC_{C,COPC_n}} \right) \times TILCR \qquad \{Eq. 1\}$$

$$HI_{sample} = \left(\frac{C_{COPC_1}}{RBC_{NC,COPC_1}} + \frac{C_{COPC_2}}{RBC_{NC,COPC_2}} + ... + \frac{C_{COPC_n}}{RBC_{NC,COPC_n}} \right) \times THQ \qquad \{Eq. 2\}$$

where:

HI_{sample} = sample-specific hazard index (unitless)

C_{COPC1} = sample-specific concentration (or 95th upper confidence limit [UCL])[15] for first of "n" COPCs (mg/kg)

C_{COPC2} = sample-specific concentration (or 95th UCL) for second of "n" COPCs (mg/kg)

C_{COPCn} = sample-specific concentration (or 95th UCL) for last of "n" COPCs (mg/kg)

$RBC_{NC,COPC1}$ = RBC for noncancer endpoint for first of "n" COPCs (mg/kg)

$RBC_{NC,COPC2}$ = RBC for noncancer endpoint for second of "n" COPCs (mg/kg)

$RBC_{NC,COPCn}$ = RBC for noncancer endpoint for last of "n" COPCs (mg/kg)

$RBC_{C,COPC1}$ = RBC for cancer endpoint for first of "n" COPCs (mg/kg);

$RBC_{C,COPC2}$ = RBC for cancer endpoint for second of "n" COPCs (mg/kg); and

$RBC_{C,COPCn}$ = RBC for cancer endpoint for last of "n" COPCs (mg/kg).

Risk values were not calculated for metals (i.e., chromium, thallium, and vanadium) with concentrations less than their respective BTV.

The risk characterization tables are included as the following attachments:

- Attachment F: Sample-specific (soil samples; all receptors)
- Attachment G: Sample-specific (sediment samples; all receptors)
- Attachment H: Sitewide 95th UCL (soil samples; all receptors); Mill Area 95th UCL (soil samples; all receptors); Cabin Area 95th UCL (soil samples; all receptors)

Based on the risk characterization tables, the risk values are driven primarily by arsenic for the cancer endpoint and arsenic and mercury for the noncancer endpoint. The risk values from these attachments are summarized in Table 8 and are color-coded below in the risk management range table (BLM, 2004).

[15] 95th UCL on the mean concentration of a particular COPC for a particular exposure area (i.e., the Mill Area, the Cabin Area, sediment in the diversion trench and unnamed tributary, and the entire site). The statistical software (ProUCL 5.0) used to calculate the BTVs is also used to calculate the 95th UCLs.

Risk Management Range	ILCR	HI
less than criteria: low risk	ILCR < 1E-05	HI < 1E+00
1-10 times the criteria: moderate risk	1E-05 ≤ ILCR ≤1E-04	1E+00 ≤ HI ≤1E+01
10-100 times the criteria: high risk	1E-04 < ILCR ≤1E-03	1E+01 < HI ≤ 1E+02
>100 times the criteria: extremely high risk	ILCR > 1E-03	HI > 1E+02

When considered from an exposure area (95th UCL) perspective, the risk management ranges indicate the following:

Cancer Endpoint

- Current and Future Recreational User Receptor: moderate risk
- Current and Future Recreational Cabin Occupant Receptor: moderate risk
- Future Construction Worker Receptor: moderate risk
- Future Full-Time Residential Receptor: high risk

Noncancer Endpoint

- Current and Future Recreational User Receptor: moderate to high risk
- Current and Future Recreational Cabin Occupant Receptor: moderate to high risk
- Future Construction Worker Receptor: high risk
- Future Full-Time Residential Receptor: high to extremely high risk

The highest risk values are associated with the Mill Area, the Sediment Area, and site-wide. The lowest risk values are associated with the Cabins Area.

When considered from a sample-specific perspective, the risk management ranges indicate the following:

Mill Area

Current and Future Recreational Receptor

Cancer Endpoint

- low risk: 13 of 21 samples
- moderate risk: 7 of 21 samples
- high risk: 1 of 21 samples
- extremely high risk: none of the 21 samples

Noncancer Endpoint

- low risk: 11 of 21 samples
- moderate risk: 7 of 21 samples
- high risk: 3 of 21 samples
- extremely high risk: none of the 21 samples

Current and Future Recreational Cabin Occupant Receptor

Cancer Endpoint

- low risk: 13 of 21 samples
- moderate risk: 6 of 21 samples
- high risk: 2 of 21 samples
- extremely high risk: none of the 21 samples

Noncancer Endpoint

- low risk: 11 of 21 samples
- moderate risk: 4 of 21 samples
- high risk: 6 of 21 samples
- extremely high risk: none of the 21 samples

Future Construction Worker Receptor

Cancer Endpoint

- low risk: 15 of 21 samples
- moderate risk: 6 of 21 samples
- high risk: none of the 21 samples
- extremely high risk: none of the 21 samples

Noncancer Endpoint

- low risk: 9 of 21 samples
- moderate risk: 4 of 21 samples
- high risk: 7 of 21 samples
- extremely high risk: 1 of 21 samples

Future Full-Time Residential Receptor

Cancer Endpoint

- low risk: 13 of 21 samples
- moderate risk: none of the 21 samples

- high risk: 7 of 21 samples
- extremely high risk: 1 of 21 samples

Noncancer Endpoint

- low risk: 10 of 21 samples
- moderate risk: 3 of 21 samples
- high risk: 5 of 21 samples
- extremely high risk: 3 of 21 samples

Cabins Area

Current and Future Recreational Receptor

Cancer Endpoint

- low risk: 13 of 18 samples
- moderate risk: 5 of 18 samples
- high risk: none of the 18 samples
- extremely high risk: none of the 18 samples

Noncancer Endpoint

- low risk: 13 of 18 samples
- moderate risk: 4 of 18 samples
- high risk: 1 of 18 samples
- extremely high risk: none of the 18 samples

Current and Future Recreational Cabin Occupant Receptor

Cancer Endpoint

- low risk: 13 of 18 samples
- moderate risk: 5 of 18 samples
- high risk: none of the 18 samples
- extremely high risk: none of the 18 samples

Noncancer Endpoint

- low risk: 12 of 18 samples
- moderate risk: 4 of 18 samples
- high risk: 2 of 18 samples
- extremely high risk: none of the 18 samples

Future Construction Worker Receptor

Cancer Endpoint

- low risk: 14 of 18 samples
- moderate risk: 4 of 18 samples
- high risk: none of the 18 samples
- extremely high risk: none of the 18 samples

Noncancer Endpoint

- low risk: 12 of 18 samples
- moderate risk: 1 of 18 samples
- high risk: 5 of 18 samples
- extremely high risk: none of the 18 samples

Future Full-Time Residential Receptor

Cancer Endpoint

- low risk: 13 of 18 samples
- moderate risk: none of the 18 samples
- high risk: 5 of 18 samples
- extremely high risk: none of the 18 samples

Noncancer Endpoint

- low risk: 12 of 18 samples
- moderate risk: 1 of 18 samples
- high risk: 4 of 18 samples
- extremely high risk: 1 of 18 samples

Sediment Area

Current and Future Recreational Receptor

Cancer Endpoint

- low risk: 3 of 7 samples
- moderate risk: 4 of 7 samples
- high risk: none of the 7 samples
- extremely high risk: none of the 7 samples

Noncancer Endpoint

- low risk: 3 of 7 samples
- moderate risk: 2 of 7 samples
- high risk: 2 of 7 samples
- extremely high risk: none of the 7 samples

Current and Future Recreational Cabin Occupant Receptor

Cancer Endpoint

- low risk: 3 of 7 samples
- moderate risk: 4 of 7 samples
- high risk: none of the 7 samples
- extremely high risk: none of the 7 samples

Noncancer Endpoint

- low risk: 3 of 7 samples
- moderate risk: 1 of 7 samples
- high risk: 3 of 7 samples
- extremely high risk: none of the 7 samples

Future Construction Worker Receptor

Cancer Endpoint

- low risk: 5 of 7 samples
- moderate risk: 2 of 7 samples
- high risk: none of the 7 samples
- extremely high risk: none of the 7 samples

Noncancer Endpoint

- low risk: 1 of 7 samples
- moderate risk: 2 of 7 samples
- high risk: 4 of 7 samples
- extremely high risk: none of the 7 samples

Future Full-Time Residential Receptor

Cancer Endpoint

- low risk: 3 of 7 samples
- moderate risk: none of the 7 samples

- high risk: 4 of 7 samples
- extremely high risk: none of the 7 samples

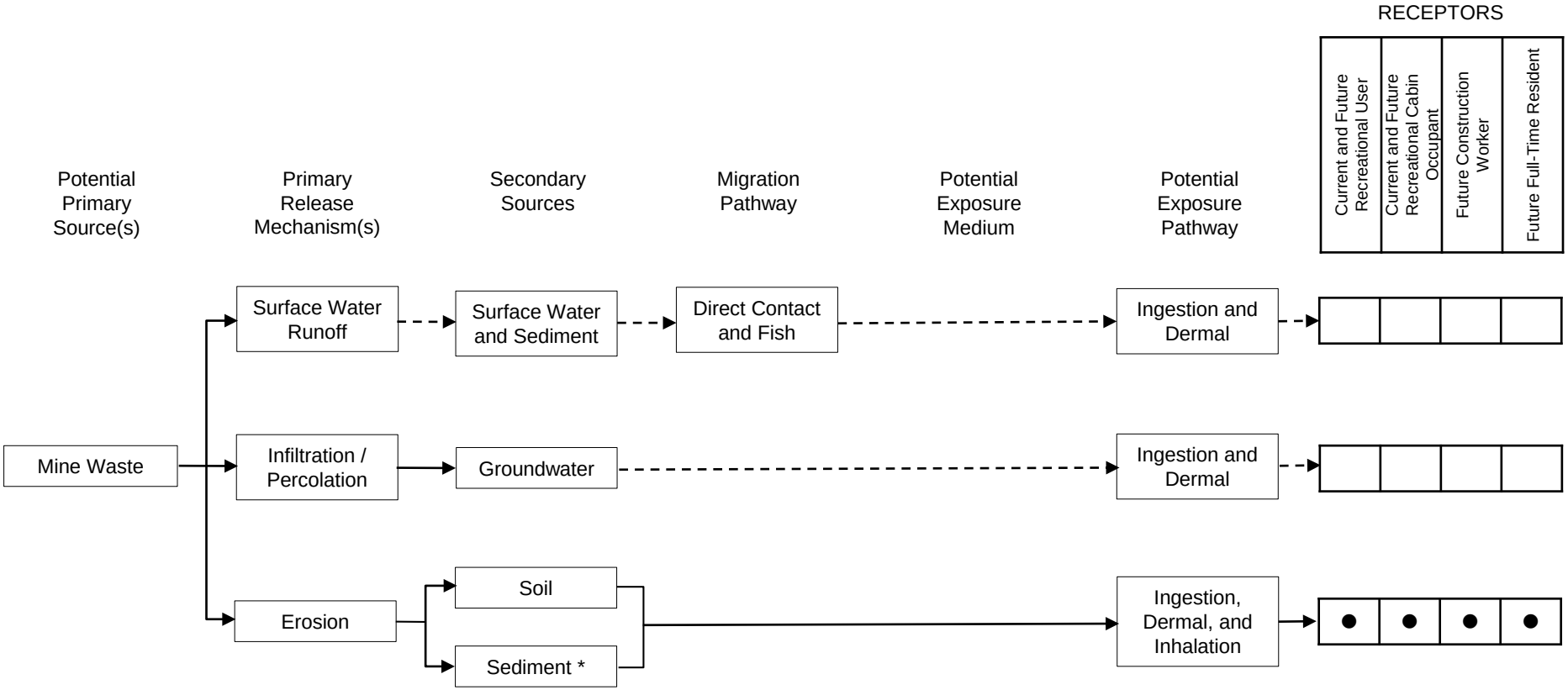
Noncancer Endpoint

- low risk: 2 of 7 samples
- moderate risk: 1 of 7 samples
- high risk: 3 of 7 samples
- extremely high risk: 1 of 7 samples

The lead screening evaluation is summarized in Table 9. With the exception of the future full-time residential receptor, which had a single high exceedance in the Mill Area and several moderate exceedances in the Mill Area, Cabin Area, and Sediment Area, moderate exceedances for the other three receptors were limited to the Mill Area (with a single exception for the construction worker receptor in the Sediment Area). No high or extremely high exceedances for lead were identified for the recreational, recreational cabin occupant, and construction worker receptors.

FIGURES

Figure 1. Conceptual Site Model (after BLM, 2004)



Potentially complete pathway

Incomplete pathway

● Potentially complete exposure pathway

* Sediment in the drainage ditch and unnamed tributary is also considered a component of the surface water pathway.

TABLES

Table 1
Background Threshold Values (BTVs) and Identification of Chemicals of Potential Concern (COPCs)

		Maximum Concentrations (mg/kg)		COPC	
Analyte	**BTV (mg/kg)[a]**	**Soil**	**Sediment**	**Soil**	**Sediment**
Antimony	0.531	230	6.2	**Yes**	**Yes**
Arsenic	13.3	210	50	**Yes**	**Yes**
Barium	281	1300	400	**Yes**	**Yes**
Beryllium	0.118	0.33	0.19	**Yes**	**Yes**
Cadmium	0.172	2.4	1.4	**Yes**	**Yes**
Chromium	12.1	9.9	10	No	No
Cobalt	7.19	17	7.2	**Yes**	**Yes**
Copper	13.0	240	85	**Yes**	**Yes**
Lead	11.5	2500	360	**Yes**	**Yes**
Mercury	0.418	120	740	**Yes**	**Yes**
Molybdenum	0.650	21	1.8	**Yes**	**Yes**
Nickel	25.5	34	28	**Yes**	**Yes**
Selenium	1.08	2.4	2	**Yes**	**Yes**
Silver	0.534	140	19	**Yes**	**Yes**
Thallium	-	0.29	0.2	No[b]	No[b]
Vanadium	38.6	29	29	No	No
Zinc	60.6	570	140	**Yes**	**Yes**

Note [a]: BTVs established using 2014 dataset (1 sample) and 2015 dataset (9 samples).
Not detect' ('ND') values were retained at their method detection limit (MDL) for calculations. B flagged data were retained at their full values as the detections in the blank samples were negligible in comparison to detected concentrations. Outliers were removed from dataset using iterative process involving box plots and normal Q-Q plots until correlation R value > 0.9 for normal Q-Q plot and Dixon test as programmed into ProUCL 5.0 identified no additional outliers at the 10% significance level.
BTV based on 95th UCL for normal distribution after confirming normality of final dataset (i.e., dataset with all outliers removed).

Note [b]: BTV could not be calculated for thallium as all background samples were "ND". Detected concentrations in soil and sediment samples were J flagged within a narrow range for both soil (0.17J to 0.29J) and sediment (0.15J to 0.2J). Given the narrow range of estimated values, these estimated detections are attributed to background; therefore,. thallium is not retained as a COPC.

Table 2. Exposure Parameters

	Recreational User (day use)	Notes	Construction Worker	Notes	Recreational Cabin Occupant	Notes	Resident	Notes
General Parameters								
Exposure Frequency; in days/year	40	a	250	b	48	c	350	b
Exposure Duration; in years	20 (adult); 6 (child)	b	1	b	20 (adult); 6 (child)	b	20 (adult); 6 (child)	b
Body Weight; in kg	80 (adult); 15 (child)	b	80	b	80 (adult); 15 (child)	b	80 (adult); 15 (child)	b
Averaging Time; in days (cancer)	25,550	b	25,550	b	25,550	b	25,550	b
Averaging Time; in days (noncancer)	7,300 (adult); 2,190 (child)	b	365	b	7,300 (adult); 2,190 (child)	b	7,300 (adult); 2,190 (child)	b
Incidental Ingestion								
Ingestion Rate; in mg/day	100 (adult); 200 (child)	b	330	b	100 (adult); 200 (child)	b	100 (adult); 200 (child)	b
Dermal Contact								
Absorption Fraction for Metals; unitless	Chemical-specific	b	Chemical-specific	b	Chemical-specific	b	Chemical-specific	b
Surface Area; in cm^2	6,032 (adult); 2,900 (child)	b	6,032	b	6,032 (adult); 2,900 (child)	b	6,032 (adult); 2,900 (child)	b
Adherence Factor; in mg/cm^2	0.07 (adult); 0.20 (child)	b	0.8	b	0.07 (adult); 0.20 (child)	b	0.07 (adult); 0.20 (child)	b
Inhalation								
Inhalation Rate; in m^3/day	20 (adult); 10 (child)	b	20	b	20 (adult); 10 (child)	b	20 (adult); 10 (child)	b
Particulate Emission Factor; in m^3/kg	1.316E+09	b	1E+06	b	1.316E+09	b	1.316E+09	b

Notes:

a = From "Dermal Exposure Assessment: Principles and Application. Interim Report." EPA/600/8-91/011B. Office of Research and Development. Washington, DC. EPA, 1992 Available online at :http://www.epa.gov/oppt/exposure/presentations/efast/usepa_1992d_dermalea.pdf

b = HERO Note 1 Cal-DTSC Office of Human and Ecological Risk, September 2014

c = Site-specific cabin use assumption (2 days per week, 3 weeks per month, 8 months per year).

cm^2 = centimeters squared

DTSC = Department of Toxic Substances Control

EPA = U.S. Environmental Protection Agency

kg = kilograms

m^3/day = cubic meters per day

m^3/kg = cubic meters per kilogram

mg/cm^2= milligrams per square centimeter

mg/day = milligrams per day

Table 3. Toxicity Criteria

	Ingestion/Dermal Contact		Inhalation	
	Cancer Effects	Noncancer Effects	Cancer Effects	Noncancer Effects
	SFO	RfD_o	IUR	RfC_i
COPC	$(mg/kg\text{-}day)^{-1}$	(mg/kg-day)	$(\mu g/m^3)^{-1}$	(mg/m^3)
Antimony	--	0.0004	--	--
Arsenic	1.5	0.0003	0.0043	0.000015
Barium	--	0.2	--	0.0005
Cadmium	--	0.001	0.0018	0.00001
Chromium[a]	0.5	0.003	0.084	0.0001
Cobalt	--	0.0003	0.009	0.000006
Copper	--	0.04	--	--
Lead[b]	--	--	--	--
Mercury	--	--	--	0.0003
Molybdenum	--	0.005	--	--
Nickel	--	0.02	0.00026	0.00009
Selenium	--	0.005	--	0.02
Silver	--	0.005	--	--
Thallium	--	0.00001	--	--
Vanadium	--	0.005	--	0.0001
Zinc	--	0.3	--	--

Notes:

All Toxicity criteria from EPA Region 9 regional screening levels unless otherwise noted, available online at: http://www.epa.gov/region9/superfund/prg/

a = Based on hexavalent chromium

b = No toxicity criteria available, direct comparison should be used. 80 mg/kg in soil (residential), 320 mg/kg (industrial) –based on California Environmental Protection Agency blood-level model, DTSC Office of Human and Ecological Risk HHRA Note Number 3 available online at: http://www.dtsc.ca.gov/AssessingRisk/upload/HHRA-Note-3-2.pdf

COPC = chemical of potential concern

DTSC = Department of Toxic Substances Control

EPA = U.S. Environmental Protection Agency

IUR = cancer inhalation unit risk

RfC_i = noncancer inhalation reference dose

RfD_o = noncancer oral reference dose

SFO = cancer oral slope factor

mg/kg-day = milligrams per kilogram per day

mg/m^3 = milligrams per cubic kilogram

$\mu g/m^3$ = micrograms per cubic meter

-- = no applicable criteria

Table **4**

Recreational User RBCs (Pathway-specific and total; in mg/kg)

~ see Attachment **A** ~

	Cancer Endpoint				Non-cancer Endpoint			
COPC	**Ingestion**	**Dermal**	**Particulate**	**TOTAL**	**Ingestion**	**Dermal**	**Particulate**	**TOTAL**
Antimony	Non-carcinogenic				2.7E+02	1.4E+03	-	2.3E+02
Arsenic	1.1E+01	6.6E+01	1.0E+05	9.2E+00	4.0E+00	2.8E+01	1.9E+05	3.5E+00
Barium	Non-carcinogenic				1.4E+05	3.3E+05	6.2E+06	9.5E+04
Beryllium	-	-	1.4E+05	1.4E+05	1.4E+02	3.3E+01	8.7E+04	2.7E+01
Cadmium	-	-	6.9E+04	6.9E+04	4.6E+01	2.7E+02	1.2E+05	3.9E+01
Cobalt	-	-	3.7E+04	3.7E+04	2.1E+02	7.1E+03	7.4E+04	2.0E+02
Copper	Non-carcinogenic				2.7E+04	9.4E+05	-	2.7E+04
Lead	Not applicable - based on blood lead level model							
Mercury	Non-carcinogenic				2.1E+02	5.0E+02	3.7E+06	1.5E+02
Molybdenum	Non-carcinogenic				3.4E+03	1.2E+05	-	3.3E+03
Nickel	-	-	1.3E+06	1.3E+06	7.5E+03	1.0E+04	1.7E+05	4.3E+03
Selenium	Non-carcinogenic				3.4E+03	1.2E+05	2.5E+08	3.3E+03
Silver	Non-carcinogenic				3.4E+03	1.2E+05	-	3.3E+03
Zinc	Non-carcinogenic				2.1E+05	7.1E+06	-	2.0E+05

Table **5**

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

~ see Attachment **B** ~

	Cancer Endpoint				Non-cancer Endpoint			
COPC	**Ingestion**	**Dermal**	**Particulate**	**TOTAL**	**Ingestion**	**Dermal**	**Particulate**	**TOTAL**
Antimony	Non-carcinogenic				2.3E+02	1.2E+03	-	1.9E+02
Arsenic	8.9E+00	5.5E+01	8.4E+04	7.7E+00	3.3E+00	2.3E+01	1.6E+05	2.9E+00
Barium	Non-carcinogenic				1.1E+05	2.8E+05	5.2E+06	7.9E+04
Beryllium	-	-	1.2E+05	1.2E+05	1.1E+02	2.8E+01	7.2E+04	2.2E+01
Cadmium	-	-	5.7E+04	5.7E+04	3.8E+01	2.3E+02	1.0E+05	3.3E+01
Cobalt	-	-	3.1E+04	3.1E+04	1.7E+02	5.9E+03	6.2E+04	1.7E+02
Copper	Non-carcinogenic				2.3E+04	7.9E+05	-	2.2E+04
Lead	Not applicable - based on blood lead level model							
Mercury	Non-carcinogenic				1.7E+02	4.1E+02	3.1E+06	1.2E+02
Molybdenum	Non-carcinogenic				2.9E+03	9.8E+04	-	2.8E+03
Nickel	-	-	1.1E+06	1.1E+06	6.3E+03	8.7E+03	1.4E+05	3.5E+03
Selenium	Non-carcinogenic				2.9E+03	9.8E+04	2.1E+08	2.8E+03
Silver	Non-carcinogenic				2.9E+03	9.8E+04	-	2.8E+03
Zinc	Non-carcinogenic				1.7E+05	5.9E+06	-	1.7E+05

Table 6

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

~ see Attachment C ~

	Cancer Endpoint				Non-cancer Endpoint			
COPC	**Ingestion**	**Dermal**	**Particulate**	**TOTAL**	**Ingestion**	**Dermal**	**Particulate**	**TOTAL**
Antimony	Non-carcinogenic				1.4E+02	1.5E+02	-	7.2E+01
Arsenic	4.3E+01	5.9E+01	9.3E+02	2.4E+01	2.1E+00	2.8E+00	6.6E+01	1.2E+00
Barium	Non-carcinogenic				7.1E+04	3.4E+04	2.2E+03	2.0E+03
Beryllium	-	-	1.3E+03	1.3E+03	7.1E+01	3.4E+00	3.1E+01	2.9E+00
Cadmium	-	-	7.3E+02	7.3E+02	2.2E+00	3.8E+00	4.4E+01	1.4E+00
Cobalt	-	-	3.4E+02	3.4E+02	1.1E+02	7.3E+02	2.6E+01	2.0E+01
Copper	Non-carcinogenic				1.4E+04	9.7E+04	-	1.2E+04
Lead	Not applicable - based on blood lead level model							
Mercury	Non-carcinogenic				1.1E+02	5.1E+01	1.3E+03	3.3E+01
Molybdenum	Non-carcinogenic				1.8E+03	1.2E+04	-	1.5E+03
Nickel	-	-	1.2E+04	1.2E+04	3.9E+03	1.1E+03	6.1E+01	5.7E+01
Selenium	Non-carcinogenic				1.8E+03	1.2E+04	8.8E+04	1.5E+03
Silver	Non-carcinogenic				1.8E+03	1.2E+04	-	1.5E+03
Zinc	Non-carcinogenic				1.1E+05	7.3E+05	-	9.3E+04

Table **7**

Residential RBCs (Pathway-specific and total; in mg/kg)

~ see Attachment **D** ~

	Cancer Endpoint				Non-cancer Endpoint			
COPC	**Ingestion**	**Dermal**	**Particulate**	**TOTAL**	**Ingestion**	**Dermal**	**Particulate**	**TOTAL**
Antimony	Non-carcinogenic				3.1E+01	*1.6E+02*	-	*2.6E+01*
Arsenic	*1.2E+00*	*7.6E+00*	*1.2E+04*	*1.1E+00*	*4.6E-01*	*3.1E+00*	2.1E+04	*4.0E-01*
Barium	Non-carcinogenic				1.6E+04	*3.8E+04*	7.1E+05	*1.1E+04*
Beryllium	-	-	*1.6E+04*	*1.6E+04*	*1.6E+01*	*3.8E+00*	*9.9E+03*	*3.0E+00*
Cadmium	-	-	*7.9E+03*	*7.9E+03*	*5.3E+00*	*3.1E+01*	*1.4E+04*	*4.5E+00*
Cobalt	-	-	*4.2E+03*	*4.2E+03*	2.3E+01	*8.1E+02*	8.5E+03	2.3E+01
Copper	Non-carcinogenic				3.1E+03	*1.1E+05*	-	*3.0E+03*
Lead	Not applicable - based on blood lead level model							
Mercury	Non-carcinogenic				2.3E+01	*5.7E+01*	4.3E+05	*1.7E+01*
Molybdenum	Non-carcinogenic				3.9E+02	*1.3E+04*	-	*3.8E+02*
Nickel	-	-	*1.5E+05*	*1.5E+05*	*8.6E+02*	*1.2E+03*	*2.0E+04*	*4.9E+02*
Selenium	Non-carcinogenic				3.9E+02	*1.3E+04*	2.8E+07	*3.8E+02*
Silver	Non-carcinogenic				3.9E+02	*1.3E+04*	-	*3.8E+02*
Zinc	Non-carcinogenic				2.3E+04	*8.1E+05*	-	2.3E+04

Italicized values are RBCs based on CalEPA values that differ from the USEPA RSLs.
Italicized values differ due to different toxicity criteria, the CalEPA ABS value of 0.01 for all metals (except As and Cd) per Table 1 of the PEA manual (DTSC, 2013), and target ILCR of 1E-05 (as opposed to 1E-06).

Table 8
Risk Characterization Summary

	UCL-Based Risk Values							
	Recreational User Receptor		Recreational Cabin Occupant Receptor		Construction Worker Receptor		Residential Receptor	
Exposure Area	ILCR	HI	ILCR	HI	ILCR	HI	ILCR	HI
Mill Area	8E-05	2.3E+01	9E-05	2.7E+01	3E-05	7.2E+01	7E-04	1.9E+02
Cabins Area	3E-05	7.8E+00	3E-05	9.4E+00	1E-05	2.5E+01	2E-04	6.6E+01
Sediment	4E-05	1.4E+01	4E-05	1.7E+01	1E-05	5.0E+01	3E-04	1.1E+02
Sitewide	5E-05	1.7E+01	6E-05	2.0E+01	2E-05	5.4E+01	4E-04	1.4E+02

	Sample-Specific Risk Values								Site Area		
	Recreational User Receptor		Recreational Cabin Occupant Receptor		Construction Worker Receptor		Residential Receptor				
Sample	ILCR	HI	ILCR	HI	ILCR	HI	ILCR	HI	Mill Area	Cabin Area	Sediment
MM-S-01	2E-05	6.9E+00	2E-05	8.3E+00	8E-06	2.3E+01	2E-04	5.8E+01	❍	-	-
MM-S-02	2E-11	1.5E+00	2E-11	1.8E+00	2E-09	6.4E+00	2E-10	9.4E+00	❍	-	-
MM-S-03	9E-05	2.6E+01	1E-04	3.1E+01	3E-05	8.1E+01	8E-04	2.2E+02	❍	-	-
MM-S-04	4E-05	2.6E+01	5E-05	3.1E+01	1E-05	9.8E+01	3E-04	1.9E+02	❍	-	-
MM-S-05	4E-11	3.4E-02	5E-11	4.1E-02	4E-09	3.0E-01	4E-10	2.5E-01	❍	-	-
MM-S-06	3E-05	8.5E+00	4E-05	1.0E+01	1E-05	2.6E+01	3E-04	7.3E+01	❍	-	-
MM-S-07	6E-11	4.2E-01	7E-11	5.1E-01	6E-09	2.1E+00	5E-10	2.7E+00	❍	-	-
MM-S-08	2E-05	4.6E+00	2E-05	5.5E+00	6E-06	1.4E+01	1E-04	3.9E+01	❍	-	-
MM-S-09	2E-04	6.1E+01	3E-04	7.3E+01	9E-05	1.8E+02	2E-03	5.3E+02	❍	-	-
MM-S-10	2E-10	1.1E+00	2E-10	1.3E+00	2E-08	5.4E+00	1E-09	7.0E+00	❍	-	-
MM-S-11	5E-11	1.9E-02	6E-11	2.3E-02	5E-09	2.7E-01	4E-10	1.5E-01	-	❍	-
MM-S-12	8E-11	1.5E-01	1E-10	1.8E-01	8E-09	9.7E-01	7E-10	9.9E-01	-	❍	-
MM-S-13	6E-11	4.1E-02	7E-11	4.9E-02	6E-09	4.1E-01	5E-10	2.9E-01	-	❍	-
MM-S-14	3E-05	7.6E+00	3E-05	9.2E+00	1E-05	2.3E+01	2E-04	6.6E+01	-	❍	-
MM-S-15	0E+00	3.7E-03	0E+00	4.5E-03	0E+00	1.6E-02	0E+00	2.3E-02	-	❍	-
MM-S-16	1E-11	1.2E-02	1E-11	1.4E-02	1E-09	8.1E-02	1E-10	8.9E-02	❍	-	-
MM-S-17	0E+00	3.8E-03	0E+00	4.5E-03	0E+00	1.6E-02	0E+00	2.4E-02	❍	-	-
MM-S-18	3E-05	8.7E+00	4E-05	1.0E+01	1E-05	2.6E+01	3E-04	7.6E+01	❍	-	-
MM-S-19	3E-09	9.4E-02	3E-09	1.1E-01	3E-07	1.4E+00	2E-08	7.4E-01	❍	-	-
MM-S-20	0E+00	6.5E-02	0E+00	7.8E-02	0E+00	2.8E-01	0E+00	4.1E-01	❍	-	-
MM-S-21	0E+00	5.3E-03	0E+00	6.4E-03	0E+00	2.3E-02	0E+00	3.3E-02	-	❍	-
MM-S-22	0E+00	4.2E-03	0E+00	5.1E-03	0E+00	1.8E-02	0E+00	2.7E-02	-	❍	-
MM-S-23	3E-11	6.5E-02	3E-11	7.8E-02	3E-09	4.1E-01	3E-10	4.2E-01	❍	-	-
MM-S-24	3E-05	9.5E+00	4E-05	1.1E+01	1E-05	3.0E+01	3E-04	8.1E+01	❍	❍	-
MM-S-25	0E+00	2.2E-02	0E+00	2.6E-02	0E+00	9.6E-02	0E+00	1.4E-01	❍	-	-
MM-S-26	0E+00	9.6E-02	0E+00	1.2E-01	0E+00	4.2E-01	0E+00	6.1E-01	❍	-	-
MM-S-27	0E+00	4.2E-03	0E+00	5.0E-03	0E+00	1.8E-02	0E+00	2.7E-02	❍	-	-
MM-S-28	3E-05	7.5E+00	3E-05	9.0E+00	1E-05	2.3E+01	2E-04	6.5E+01	-	❍	-
MM-S-29	1E-11	2.1E-02	2E-11	2.5E-02	1E-09	1.2E-01	1E-10	1.5E-01	❍	❍	-
MM-S-30	4E-05	1.2E+01	5E-05	1.4E+01	2E-05	3.7E+01	4E-04	1.0E+02	-	❍	-
MM-S-31	0E+00	6.1E-03	0E+00	7.3E-03	0E+00	2.6E-02	0E+00	3.8E-02	-	❍	-
MM-S-32	6E-11	1.0E+00	7E-11	1.2E+00	5E-09	4.7E+00	5E-10	6.4E+00	-	❍	-
MM-S-33	6E-11	1.2E-01	7E-11	1.5E-01	6E-09	7.3E-01	5E-10	8.2E-01	-	❍	-
MM-S-34	2E-11	4.3E-02	3E-11	5.2E-02	3E-09	2.4E-01	2E-10	3.1E-01	-	❍	-
MM-S-35	3E-05	7.4E+00	3E-05	8.9E+00	1E-05	2.3E+01	2E-04	6.4E+01	-	❍	-
MM-S-36	1E-11	1.2E-02	1E-11	1.5E-02	1E-09	7.8E-02	9E-11	9.5E-02	-	❍	-
MM-S-37	9E-12	2.4E-02	1E-11	2.9E-02	1E-09	1.2E-01	8E-11	1.7E-01	-	❍	-
MM-SD-02 (PPE)	5E-05	1.4E+01	7E-05	1.7E+01	2E-05	4.2E+01	5E-04	1.3E+02	-	-	❍
MM-SD-03 (Dwnstrm)	4E-05	1.0E+01	5E-05	1.2E+01	1E-05	3.0E+01	3E-04	9.0E+01	-	-	❍
MM-SD-04	4E-10	7.3E-02	5E-10	8.8E-02	4E-08	1.5E+00	4E-09	5.7E-01	-	-	❍
MM-SD-05	2E-09	5.0E-01	2E-09	6.0E-01	2E-07	2.6E+00	2E-08	3.3E+00	-	-	❍
MM-SD-06	2E-05	9.7E+00	2E-05	1.2E+01	7E-06	3.6E+01	2E-04	7.3E+01	-	-	❍
MM-SD-07	2E-05	7.8E+00	2E-05	9.3E+00	7E-06	2.8E+01	2E-04	6.1E+01	-	-	❍
MM-SD-08	3E-11	9.5E-03	4E-11	1.1E-02	3E-09	1.9E-01	3E-10	7.5E-02	-	-	❍

Highlighted values

1E-05 ≤ ILCR ≤ 1E-04; 1E+00 ≤ HI ≤ 1E+01

1E-04 < ILCR ≤ 1E-03; 1E+01 < HI ≤ 1E+02

ILCR > 1E-03; HI > 1E+02

Table 9
Lead Screening Summary

	Ratio of UCL-Based Concentration to Lead Screening Level (unitless)			
Area	**Recreational User Receptor**	**Recreational Cabin Occupant Receptor**	**Construction Worker Receptor**	**Residential Receptor**
Mill Area	7.9E-01	9.3E-01	1.7E+00	6.9E+00
Cabins Area	1.3E-01	1.5E-01	2.7E-01	1.1E+00
Sediment	2.9E-01	3.4E-01	6.3E-01	2.5E+00
Sitewide	6.9E-01	8.2E-01	1.5E+00	6.0E+00

	Ratio of Sample-Specific Concentration to Lead Screening Level (unitless)				Site Area		
Sample	**Recreational User Receptor**	**Recreational Cabin Occupant Receptor**	**Construction Worker Receptor**	**Residential Receptor**	**Mill Area**	**Cabin Area**	**Sediment**
MM-S-01	3.6E+00	4.2E+00	7.8E+00	3.1E+01	❍	-	-
MM-S-02	2.1E-01	2.5E-01	4.7E-01	1.9E+00	❍	-	-
MM-S-03	6.1E-01	7.3E-01	1.3E+00	5.4E+00	❍	-	-
MM-S-04	5.4E-01	6.4E-01	1.2E+00	4.8E+00	❍	-	-
MM-S-05	2.6E-02	3.1E-02	5.6E-02	2.3E-01	❍	-	-
MM-S-06	8.6E-01	1.0E+00	1.9E+00	7.5E+00	❍	-	-
MM-S-07	5.6E-02	6.6E-02	1.2E-01	4.9E-01	❍	-	-
MM-S-08	3.1E-01	3.7E-01	6.9E-01	2.8E+00	❍	-	-
MM-S-09	1.1E+00	1.3E+00	2.3E+00	9.4E+00	❍	-	-
MM-S-10	2.6E-01	3.1E-01	5.6E-01	2.3E+00	❍	-	-
MM-S-11	1.4E-02	1.7E-02	3.1E-02	1.2E-01	-	❍	-
MM-S-12	2.4E-02	2.9E-02	5.3E-02	2.1E-01	-	❍	-
MM-S-13	6.3E-02	7.5E-02	1.4E-01	5.5E-01	-	❍	-
MM-S-14	4.6E-02	5.4E-02	1.0E-01	4.0E-01	-	❍	-
MM-S-15	3.9E-03	4.6E-03	8.4E-03	3.4E-02	-	❍	-
MM-S-16	1.3E-02	1.5E-02	2.8E-02	1.1E-01	❍	-	-
MM-S-17	8.0E-03	9.5E-03	1.8E-02	7.0E-02	❍	-	-
MM-S-18	1.3E-01	1.5E-01	2.8E-01	1.1E+00	❍	-	-
MM-S-19	7.3E-02	8.6E-02	1.6E-01	6.4E-01	❍	-	-
MM-S-20	2.4E-01	2.9E-01	5.3E-01	2.1E+00	❍	-	-
MM-S-21	1.2E-02	1.4E-02	2.6E-02	1.0E-01	-	❍	-
MM-S-22	2.4E-02	2.9E-02	5.3E-02	2.1E-01	-	❍	-
MM-S-23	1.4E-02	1.6E-02	3.0E-02	1.2E-01	❍	-	-
MM-S-24	1.3E-01	1.6E-01	2.9E-01	1.2E+00	❍	❍	-
MM-S-25	1.4E-02	1.7E-02	3.1E-02	1.3E-01	❍	-	-
MM-S-26	2.4E-02	2.9E-02	5.3E-02	2.1E-01	❍	-	-
MM-S-27	1.0E-02	1.2E-02	2.2E-02	8.9E-02	❍	-	-
MM-S-28	1.4E-01	1.6E-01	3.0E-01	1.2E+00	-	❍	-
MM-S-29	1.6E-02	1.9E-02	3.4E-02	1.4E-01	❍	❍	-
MM-S-30	1.6E-01	1.9E-01	3.4E-01	1.4E+00	-	❍	-
MM-S-31	5.9E-03	6.9E-03	1.3E-02	5.1E-02	-	❍	-
MM-S-32	7.1E-02	8.5E-02	1.6E-01	6.3E-01	-	❍	-
MM-S-33	7.0E-02	8.3E-02	1.5E-01	6.1E-01	-	❍	-
MM-S-34	1.2E-02	1.5E-02	2.7E-02	1.1E-01	-	❍	-
MM-S-35	1.4E-01	1.7E-01	3.1E-01	1.2E+00	-	❍	-
MM-S-36	1.7E-02	2.0E-02	3.8E-02	1.5E-01	-	❍	-
MM-S-37	3.4E-01	4.1E-01	7.5E-01	3.0E+00	-	❍	-
MM-SD-02 (PPE)	1.0E-02	1.2E-02	2.3E-02	9.0E-02	-	-	❍
MM-SD-03 (Dwnstrm)	1.0E-02	1.2E-02	2.2E-02	8.8E-02	-	-	❍
MM-SD-04	6.6E-02	7.8E-02	1.4E-01	5.8E-01	-	-	❍
MM-SD-05	1.9E-01	2.2E-01	4.1E-01	1.6E+00	-	-	❍
MM-SD-06	2.6E-01	3.1E-01	5.6E-01	2.3E+00	-	-	❍
MM-SD-07	5.1E-01	6.1E-01	1.1E+00	4.5E+00	-	-	❍
MM-SD-08	8.7E-03	1.0E-02	1.9E-02	7.6E-02	-	-	❍

Highlighted values

1E+00 ≤ Ratio ≤ 1E+01	"moderate risk"
1E+01 < Ratio ≤ 1E+02	"high risk"
Ratio > 1E+02	"extremely high risk"

ATTACHMENT A

ABBREVIATIONS

COPC	chemical of potential concern
TR	target incremental lifetime cancer risk (1E-05 per BLM, 2004)
THQ	target hazard quotient (1E+00 per BLM, 2004)
AT (d)	averaging time (days)
BW (kg)	body weight (kilograms)
RfDo (mg/kg-d)	oral reference dose (milligram per kilogram per day)
EF (d/yr)	exposure frequency (days per year)
ED (yr)	exposure duration (years)
IR (mg/d)	ingestion rate (milligrams per day)
B oral (-)	bioavailability (dimensionless)
FI (-)	fraction ingested (dimensionless)
CF (kg/mg)	conversion factor (kilogram per milligram)
RBC (mg/kg)	risk-based concentration (milligram per kilogram)
GIABS	gastrointestinal absorption factor (dimensionless)
SA (cm2)	surface area (square centimeters)
AF (mg/cm2)	adherence factor (milligram per square centimeter)
ABS (-)	absorption factor (dimensionless)
RfC (mg/m3)	reference concentration (milligram per cubic meter)
REL (mg/m3)	reference exposure level (milligram per cubic meter)
PEF (m3/kg)	particulate emission factor (cubic meters per kilogram)
ET (hr/d)	exposure time (hours per day)
IFS (mg/kg)	receptor-weighted ingestion factor for soil (milligrams per kilogram)
DFS (mg/kg)	receptor-weighted dermal factor for soil (milligrams per kilogram)

ARSENIC (Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1E-05	25550	15 80	*9.5E+00*	40	6 20	200 100	0.6	1	**4200**	1E-06	**1.1E+01**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1E-05	25550	15 80	*9.5E+00*	1.0E+00	40	6 20	*2900* 6032	0.2 0.07	3.0E-02	**13502**	1E-06	**6.6E+01**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Arsenic	1E-05	25550	*3.3E-03*	1.36E+09	24	40	26	24	1000	**1.0E+05**

Total RBC => 9.2E+00

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

BERYLLIUM (Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1E-05	25550	15 80	-	40	6 20	200 100	1	1	**4200**	1E-06	**-**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1E-05	25550	15 80	-	7.0E-03	40	6 20	*2900* 6032	0.2 0.07	*1.0E-02*	**13502**	1E-06	**-**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Beryllium	1E-05	25550	2.4E-03	1.36E+09	24	40	26	24	1000	**1.4E+05**

Total RBC => 1.4E+05

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

CADMIUM (Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1E-05	25550	15 80	-	40	6 20	200 100	1	1	**4200**	1E-06	**-**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1E-05	25550	15 80	-	1.0E+00	40	6 20	*2900* 6032	0.2 0.07	1.0E-03	**13502**	1E-06	**-**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Cadmium	1E-05	25550	*4.2E-03*	1.36E+09	24	40	*30*	24	1000	**6.9E+04**

Total RBC => 6.9E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

COBALT (Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo $(mg/kg\text{-}d)^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1E-05	25550	15 80	-	40	6 20	200 100	1	1	**4200**	1E-06	**-**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo $(mg/kg\text{-}d)^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1E-05	25550	15 80	-	1.0E+00	40	6 20	*2900* 6032	0.2 0.07	*1.0E-02*	**13502**	1E-06	**-**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR $(ug/m3)^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Cobalt	1E-05	25550	9.0E-03	1.36E+09	24	40	26	24	1000	**3.7E+04**

Total RBC => 3.7E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

NICKEL (Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Nickel	1E-05	25550	15 80	-	40	6 20	200 100	1	1	**4200**	1E-06	**-**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Nickel	1E-05	25550	15 80	-	1.0E+00	40	6 20	*2900* 6032	0.2 0.07	*1.0E-02*	**13502**	1E-06	**-**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Nickel	1E-05	25550	2.6E-04	1.36E+09	24	40	26	24	1000	**1.3E+06**

Total RBC => 1.3E+06

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

ANTIMONY (Non-Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Antimony	1	2190	15	4.0E-04		40	6	200	1	1				1E-06	**2.7E+02**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Antimony	1	2190	15	4.0E-04	1.5E-01	40	6			*2900*	0.2	*1.0E-02*	1E-06	**1.4E+03**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Antimony	1	2190	-	1.36E+09	24	40	6						24	**-**

Total RBC => 2.3E+02

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

ARSENIC (Non-Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1	2190	15	*3.5E-06*	40	6	200	0.6	1	1E-06	**4.0E+00**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1	2190	15	*3.5E-06*	1.0E+00	40	6	*2900*	0.2	3.0E-02	1E-06	**2.8E+01**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Arsenic	1	2190	1.5E-05	1.36E+09	24	40	6	24	**1.9E+05**

Total RBC => 3.5E+00

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

BARIUM (Non-Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Barium	1	2190	15	2.0E-01	40	6	200	1	1	1E-06	**1.4E+05**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Barium	1	2190	15	2.0E-01	7.0E-02	40	6	*2900*	0.2	*1.0E-02*	1E-06	**3.3E+05**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Barium	1	2190	5.0E-04	1.36E+09	24	40	6	24	**6.2E+06**

Total RBC => 9.5E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

BERYLLIUM (Non-Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1	2190	15	*2.0E-04*	40	6	200	1	1	1E-06	**1.4E+02**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1	2190	15	*2.0E-04*	7.0E-03	40	6	*2900*	0.2	*1.0E-02*	1E-06	**3.3E+01**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Beryllium	1	2190	*7.0E-06*	1.36E+09	24	40	6	24	**8.7E+04**

Total RBC => 2.7E+01

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

CADMIUM (Non-Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-30 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1	10950	*80*	*6.3E-06*		40	*30*	*100*	1	1				1E-06	**4.6E+01**

Dermal Contact (age 0-30 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)				SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1	10950	*80*	*6.3E-06*	2.5E-02	40	*30*				*6032*	*0.07*	1.0E-03	1E-06	**2.7E+02**

Inhalation of Particulates (age 0-30 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)							CF (hr/day)	**RBC (mg/kg)**
Cadmium	1	10950	1.0E-05	1.36E+09	24	40	*30*							24	**1.2E+05**

Total RBC => 3.9E+01

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

COBALT (Non-Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1	2190	15	3.0E-04	40	6	200	1	1	1E-06	**2.1E+02**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1	2190	15	3.0E-04	1.0E+00	40	6	*2900*	0.2	*1.0E-02*	1E-06	**7.1E+03**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Cobalt	1	2190	6.0E-06	1.36E+09	24	40	6	24	**7.4E+04**

Total RBC => 2.0E+02

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

COPPER (Non-Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Copper	1	2190	15	4.0E-02		40	6	200	1	1				1E-06	**2.7E+04**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)				SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Copper	1	2190	15	4.0E-02	1.0E+00	40	6				*2900*	0.2	*1.0E-02*	1E-06	**9.4E+05**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)							CF (hr/day)	**RBC (mg/kg)**
Copper	1	2190	-	1.36E+09	24	40	6							24	**-**

Total RBC => 2.7E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

MERCURY (Non-Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Mercury	1	2190	15	3.0E-04		40	6	200	1	1				1E-06	**2.1E+02**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Mercury	1	2190	15	3.0E-04	7.0E-02	40	6			*2900*	0.2	*1.0E-02*	1E-06	**5.0E+02**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Mercury	1	2190	3.0E-04	1.36E+09	24	40	6						24	**3.7E+06**

Total RBC => 1.5E+02

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

MOLYBDENUM (Non-Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Molybdenum	1	2190	15	5.0E-03	40	6	200	1	1	1E-06	**3.4E+03**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Molybdenum	1	2190	15	5.0E-03	1.0E+00	40	6	*2900*	0.2	*1.0E-02*	1E-06	**1.2E+05**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Molybdenum	1	2190	-	1.36E+09	24	40	6	24	**-**

Total RBC => 3.3E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

NICKEL (Non-Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Nickel	1	2190	15	*1.1E-02*		40	6	200	1	1				1E-06	**7.5E+03**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Nickel	1	2190	15	*1.1E-02*	4.0E-02	40	6			*2900*	0.2	*1.0E-02*	1E-06	**1.0E+04**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Nickel	1	2190	*1.4E-05*	1.36E+09	24	40	6						24	**1.7E+05**

Total RBC => 4.3E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

SELENIUM (Non-Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Selenium	1	2190	15	5.0E-03	40	6	200	1	1	1E-06	**3.4E+03**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Selenium	1	2190	15	5.0E-03	1.0E+00	40	6	*2900*	0.2	*1.0E-02*	1E-06	**1.2E+05**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Selenium	1	2190	2.0E-02	1.36E+09	24	40	6	24	**2.5E+08**

Total RBC => 3.3E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

SILVER (Non-Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Silver	1	2190	15	5.0E-03	40	6	200	1	1	1E-06	**3.4E+03**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Silver	1	2190	15	5.0E-03	1.0E+00	40	6	*2900*	0.2	*1.0E-02*	1E-06	**1.2E+05**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Silver	1	2190	-	1.36E+09	24	40	6	24	**-**

Total RBC => 3.3E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

ZINC (Non-Cancer Endpoint)

Recreational User RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Zinc	1	2190	15	3.0E-01		40	6	200	1	1				1E-06	**2.1E+05**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Zinc	1	2190	15	3.0E-01	1.0E+00	40	6			*2900*	0.2	*1.0E-02*	1E-06	**7.1E+06**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Zinc	1	2190	-	1.36E+09	24	40	6						24	**-**

Total RBC => 2.0E+05

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

ATTACHMENT B

ABBREVIATIONS

COPC	chemical of potential concern
TR	target incremental lifetime cancer risk (1E-05 per BLM, 2004)
THQ	target hazard quotient (1E+00 per BLM, 2004)
AT (d)	averaging time (days)
BW (kg)	body weight (kilograms)
RfDo (mg/kg-d)	oral reference dose (milligram per kilogram per day)
EF (d/yr)	exposure frequency (days per year)
ED (yr)	exposure duration (years)
IR (mg/d)	ingestion rate (milligrams per day)
B oral (-)	bioavailability (dimensionless)
FI (-)	fraction ingested (dimensionless)
CF (kg/mg)	conversion factor (kilogram per milligram)
RBC (mg/kg)	risk-based concentration (milligram per kilogram)
GIABS	gastrointestinal absorption factor (dimensionless)
SA (cm2)	surface area (square centimeters)
AF (mg/cm2)	adherence factor (milligram per square centimeter)
ABS (-)	absorption factor (dimensionless)
RfC (mg/m3)	reference concentration (milligram per cubic meter)
REL (mg/m3)	reference exposure level (milligram per cubic meter)
PEF (m3/kg)	particulate emission factor (cubic meters per kilogram)
ET (hr/d)	exposure time (hours per day)
IFS (mg/kg)	receptor-weighted ingestion factor for soil (milligrams per kilogram)
DFS (mg/kg)	receptor-weighted dermal factor for soil (milligrams per kilogram)

ARSENIC (Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1E-05	25550	15 80	*9.5E+00*	48	6 20	200 100	0.6	1	**5040**	1E-06	**8.9E+00**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1E-05	25550	15 80	*9.5E+00*	1.0E+00	48	6 20	*2900* 6032	0.2 0.07	3.0E-02	**16203**	1E-06	**5.5E+01**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Arsenic	1E-05	25550	*3.3E-03*	1.36E+09	24	48	26	24	1000	**8.4E+04**

Total RBC => 7.7E+00

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

BERYLLIUM (Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1E-05	25550	15 80	-	48	6 20	200 100	1	1	**5040**	1E-06	**-**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1E-05	25550	15 80	-	7.0E-03	48	6 20	*2900* 6032	0.2 0.07	*1.0E-02*	**16203**	1E-06	**-**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Beryllium	1E-05	25550	2.4E-03	1.36E+09	24	48	26	24	1000	**1.2E+05**

Total RBC => 1.2E+05

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

CADMIUM (Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo $(mg/kg\text{-}d)^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1E-05	25550	15 80	-	48	6 20	200 100	1	1	**5040**	1E-06	**-**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo $(mg/kg\text{-}d)^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1E-05	25550	15 80	-	1.0E+00	48	6 20	*2900* 6032	0.2 0.07	1.0E-03	**16203**	1E-06	**-**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR $(ug/m3)^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Cadmium	1E-05	25550	*4.2E-03*	1.36E+09	24	48	*30*	24	1000	**5.7E+04**

Total RBC => 5.7E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

COBALT (Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1E-05	25550	15 80	-	48	6 20	200 100	1	1	**5040**	1E-06	**-**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1E-05	25550	15 80	-	1.0E+00	48	6 20	*2900* 6032	0.2 0.07	*1.0E-02*	**16203**	1E-06	**-**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Cobalt	1E-05	25550	9.0E-03	1.36E+09	24	48	26	24	1000	**3.1E+04**

Total RBC => 3.1E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

NICKEL (Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Nickel	1E-05	25550	15 80	-	48	6 20	200 100	1	1	**5040**	1E-06	**-**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Nickel	1E-05	25550	15 80	-	1.0E+00	48	6 20	*2900* 6032	0.2 0.07	*1.0E-02*	**16203**	1E-06	**-**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Nickel	1E-05	25550	2.6E-04	1.36E+09	24	48	26	24	1000	**1.1E+06**

Total RBC => 1.1E+06

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

ANTIMONY (Non-Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Antimony	1	2190	15	4.0E-04	48	6	200	1	1	1E-06	**2.3E+02**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Antimony	1	2190	15	4.0E-04	1.5E-01	48	6	*2900*	0.2	*1.0E-02*	1E-06	**1.2E+03**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Antimony	1	2190	-	1.36E+09	24	48	6	24	**-**

Total RBC => 1.9E+02

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

ARSENIC (Non-Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1	2190	15	*3.5E-06*	48	6	200	0.6	1	1E-06	**3.3E+00**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1	2190	15	*3.5E-06*	1.0E+00	48	6	*2900*	0.2	3.0E-02	1E-06	**2.3E+01**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Arsenic	1	2190	1.5E-05	1.36E+09	24	48	6	24	**1.6E+05**

Total RBC => 2.9E+00

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

BARIUM (Non-Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Barium	1	2190	15	2.0E-01	48	6	200	1	1	1E-06	**1.1E+05**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Barium	1	2190	15	2.0E-01	7.0E-02	48	6	*2900*	0.2	*1.0E-02*	1E-06	**2.8E+05**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Barium	1	2190	5.0E-04	1.36E+09	24	48	6	24	**5.2E+06**

Total RBC => 7.9E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

BERYLLIUM (Non-Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1	2190	15	*2.0E-04*	48	6	200	1	1	1E-06	**1.1E+02**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1	2190	15	*2.0E-04*	7.0E-03	48	6	*2900*	0.2	*1.0E-02*	1E-06	**2.8E+01**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Beryllium	1	2190	*7.0E-06*	1.36E+09	24	48	6	24	**7.2E+04**

Total RBC => 2.2E+01

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

CADMIUM (Non-Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-30 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1	10950	*80*	*6.3E-06*	48	*30*	*100*	1	1	1E-06	**3.8E+01**

Dermal Contact (age 0-30 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1	10950	*80*	*6.3E-06*	2.5E-02	48	*30*	*6032*	*0.07*	1.0E-03	1E-06	**2.3E+02**

Inhalation of Particulates (age 0-30 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Cadmium	1	10950	1.0E-05	1.36E+09	24	48	*30*	24	**1.0E+05**

Total RBC => 3.3E+01

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

COBALT (Non-Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1	2190	15	3.0E-04	48	6	200	1	1	1E-06	**1.7E+02**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1	2190	15	3.0E-04	1.0E+00	48	6	*2900*	0.2	*1.0E-02*	1E-06	**5.9E+03**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Cobalt	1	2190	6.0E-06	1.36E+09	24	48	6	24	**6.2E+04**

Total RBC => 1.7E+02

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

COPPER (Non-Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Copper	1	2190	15	4.0E-02	48	6	200	1	1	1E-06	**2.3E+04**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Copper	1	2190	15	4.0E-02	1.0E+00	48	6	*2900*	0.2	*1.0E-02*	1E-06	**7.9E+05**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Copper	1	2190	-	1.36E+09	24	48	6	24	**-**

Total RBC => 2.2E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

MERCURY (Non-Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Mercury	1	2190	15	3.0E-04		48	6	200	1	1				1E-06	**1.7E+02**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Mercury	1	2190	15	3.0E-04	7.0E-02	48	6			*2900*	0.2	*1.0E-02*	1E-06	**4.1E+02**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Mercury	1	2190	3.0E-04	1.36E+09	24	48	6						24	**3.1E+06**

Total RBC => 1.2E+02

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

MOLYBDENUM (Non-Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Molybdenum	1	2190	15	5.0E-03	48	6	200	1	1	1E-06	**2.9E+03**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Molybdenum	1	2190	15	5.0E-03	1.0E+00	48	6	*2900*	0.2	*1.0E-02*	1E-06	**9.8E+04**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Molybdenum	1	2190	-	1.36E+09	24	48	6	24	**-**

Total RBC => 2.8E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

NICKEL (Non-Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Nickel	1	2190	15	*1.1E-02*		48	6	200	1	1				1E-06	**6.3E+03**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Nickel	1	2190	15	*1.1E-02*	4.0E-02	48	6			*2900*	0.2	*1.0E-02*	1E-06	**8.7E+03**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Nickel	1	2190	*1.4E-05*	1.36E+09	24	48	6						24	**1.4E+05**

Total RBC => 3.5E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

SELENIUM (Non-Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Selenium	1	2190	15	5.0E-03	48	6	200	1	1	1E-06	**2.9E+03**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Selenium	1	2190	15	5.0E-03	1.0E+00	48	6	*2900*	0.2	*1.0E-02*	1E-06	**9.8E+04**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Selenium	1	2190	2.0E-02	1.36E+09	24	48	6	24	**2.1E+08**

Total RBC => 2.8E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

SILVER (Non-Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Silver	1	2190	15	5.0E-03	48	6	200	1	1	1E-06	**2.9E+03**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Silver	1	2190	15	5.0E-03	1.0E+00	48	6	*2900*	0.2	*1.0E-02*	1E-06	**9.8E+04**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Silver	1	2190	-	1.36E+09	24	48	6	24	**-**

Total RBC => 2.8E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

ZINC (Non-Cancer Endpoint)

Recreational Cabin Occupant RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Zinc	1	2190	15	3.0E-01	48	6	200	1	1	1E-06	**1.7E+05**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Zinc	1	2190	15	3.0E-01	1.0E+00	48	6	*2900*	0.2	*1.0E-02*	1E-06	**5.9E+06**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Zinc	1	2190	-	1.36E+09	24	48	6	24	**-**

Total RBC => 1.7E+05

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

ATTACHMENT C

ABBREVIATIONS

COPC	chemical of potential concern
TR	target incremental lifetime cancer risk (1E-05 per BLM, 2004)
THQ	target hazard quotient (1E+00 per BLM, 2004)
AT (d)	averaging time (days)
BW (kg)	body weight (kilograms)
RfDo (mg/kg-d)	oral reference dose (milligram per kilogram per day)
EF (d/yr)	exposure frequency (days per year)
ED (yr)	exposure duration (years)
IR (mg/d)	ingestion rate (milligrams per day)
B oral (-)	bioavailability (dimensionless)
FI (-)	fraction ingested (dimensionless)
CF (kg/mg)	conversion factor (kilogram per milligram)
RBC (mg/kg)	risk-based concentration (milligram per kilogram)
GIABS	gastrointestinal absorption factor (dimensionless)
SA (cm2)	surface area (square centimeters)
AF (mg/cm2)	adherence factor (milligram per square centimeter)
ABS (-)	absorption factor (dimensionless)
RfC (mg/m3)	reference concentration (milligram per cubic meter)
REL (mg/m3)	reference exposure level (milligram per cubic meter)
PEF (m3/kg)	particulate emission factor (cubic meters per kilogram)
ET (hr/d)	exposure time (hours per day)
IFS (mg/kg)	receptor-weighted ingestion factor for soil (milligrams per kilogram)
DFS (mg/kg)	receptor-weighted dermal factor for soil (milligrams per kilogram)

ARSENIC (Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1E-05	25550	80	*9.5E+00*	250	1	330	0.6	1	**1031**	1E-06	**4.3E+01**

Dermal Contact

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1E-05	25550	80	*9.5E+00*	1.0E+00	250	1	6032	0.8	3.0E-02	**15080**	1E-06	**5.9E+01**

Inhalation of Particulates

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Arsenic	1E-05	25550	*3.3E-03*	1E+06	8	250	1	24	1000	**9.3E+02**

Total RBC => 2.4E+01

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

BERYLLIUM (Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1E-05	25550	80	-	250	1	330	1	1	**1031**	1E-06	**-**

Dermal Contact

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1E-05	25550	80	-	7.0E-03	250	1	6032	0.8	*1.0E-02*	**15080**	1E-06	**-**

Inhalation of Particulates

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Beryllium	1E-05	25550	2.4E-03	1E+06	8	250	1	24	1000	**1.3E+03**

Total RBC => 1.3E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

CADMIUM (Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1E-05	25550	80	-	250	1	330	1	1	**1031**	1E-06	**-**

Dermal Contact

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1E-05	25550	80	-	1.0E+00	250	1	6032	0.8	1.0E-03	**15080**	1E-06	**-**

Inhalation of Particulates

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Cadmium	1E-05	25550	*4.2E-03*	1E+06	8	250	1	24	1000	**7.3E+02**

Total RBC => 7.3E+02

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

COBALT (Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1E-05	25550	80	-	250	1	330	1	1	**1031**	1E-06	**-**

Dermal Contact

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1E-05	25550	80	-	1.0E+00	250	1	6032	0.8	*1.0E-02*	**15080**	1E-06	**-**

Inhalation of Particulates

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Cobalt	1E-05	25550	9.0E-03	1E+06	8	250	1	24	1000	**3.4E+02**

Total RBC => 3.4E+02

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

NICKEL (Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Nickel	1E-05	25550	80	-	250	1	330	1	1	**1031**	1E-06	**-**

Dermal Contact

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Nickel	1E-05	25550	80	-	1.0E+00	250	1	6032	0.8	*1.0E-02*	**15080**	1E-06	**-**

Inhalation of Particulates

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Nickel	1E-05	25550	2.6E-04	1E+06	8	250	1	24	1000	**1.2E+04**

Total RBC => 1.2E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

ANTIMONY (Non-Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Antimony	1	365	80	4.0E-04		250	1	330	1	1				1E-06	**1.4E+02**

Dermal Contact

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)				SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Antimony	1	365	80	4.0E-04	1.5E-01	250	1				6032	0.8	*1.0E-02*	1E-06	**1.5E+02**

Inhalation of Particulates

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)							CF (hr/day)	**RBC (mg/kg)**
Antimony	1	365	-	1E+06	8	250	1							24	**-**

Total RBC => 7.2E+01

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

ARSENIC (Non-Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)			CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1	365	80	3.5E-06		250	1	330	0.6	1			1E-06	**2.1E+00**

Dermal Contact

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1	365	80	3.5E-06	1.0E+00	250	1			6032	0.8	3.0E-02	1E-06	**2.8E+00**

Inhalation of Particulates

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Arsenic	1	365	1.5E-05	1E+06	8	250	1						24	**6.6E+01**

Total RBC => 1.2E+00

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

BARIUM (Non-Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Barium	1	365	80	2.0E-01		250	1	330	1	1				1E-06	**7.1E+04**

Dermal Contact

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Barium	1	365	80	2.0E-01	7.0E-02	250	1			6032	0.8	*1.0E-02*	1E-06	**3.4E+04**

Inhalation of Particulates

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Barium	1	365	5.0E-04	1E+06	8	250	1						24	**2.2E+03**

Total RBC => 2.0E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

BERYLLIUM (Non-Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1	365	80	2.0E-04	250	1	330	1	1	1E-06	**7.1E+01**

Dermal Contact

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1	365	80	2.0E-04	7.0E-03	250	1	6032	0.8	*1.0E-02*	1E-06	**3.4E+00**

Inhalation of Particulates

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Beryllium	1	365	*7.0E-06*	1E+06	8	250	1	24	**3.1E+01**

Total RBC => 2.9E+00

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

CADMIUM (Non-Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1	365	80	6.3E-06		250	1	330	1	1				1E-06	**2.2E+00**

Dermal Contact

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)				SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1	365	80	6.3E-06	2.5E-02	250	1				6032	0.8	1.0E-03	1E-06	**3.8E+00**

Inhalation of Particulates

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)							CF (hr/day)	**RBC (mg/kg)**
Cadmium	1	365	1.0E-05	1E+06	8	250	1							24	**4.4E+01**

Total RBC => 1.4E+00

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

COBALT (Non-Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1	365	80	3.0E-04		250	1	330	1	1				1E-06	**1.1E+02**

Dermal Contact

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)				SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1	365	80	3.0E-04	1.0E+00	250	1				6032	0.8	*1.0E-02*	1E-06	**7.3E+02**

Inhalation of Particulates

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)							CF (hr/day)	**RBC (mg/kg)**
Cobalt	1	365	6.0E-06	1E+06	8	250	1							24	**2.6E+01**

Total RBC => 2.0E+01

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

COPPER (Non-Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Copper	1	365	80	4.0E-02		250	1	330	1	1				1E-06	**1.4E+04**

Dermal Contact

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Copper	1	365	80	4.0E-02	1.0E+00	250	1			6032	0.8	*1.0E-02*	1E-06	**9.7E+04**

Inhalation of Particulates

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Copper	1	365	-	1E+06	8	250	1						24	**-**

Total RBC => 1.2E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

MERCURY (Non-Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)			CF (kg/mg)	**RBC (mg/kg)**
Mercury	1	365	80	3.0E-04		250	1	330	1	1			1E-06	**1.1E+02**

Dermal Contact

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Mercury	1	365	80	3.0E-04	7.0E-02	250	1			6032	0.8	*1.0E-02*	1E-06	**5.1E+01**

Inhalation of Particulates

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Mercury	1	365	3.0E-04	1E+06	8	250	1						24	**1.3E+03**

Total RBC => 3.3E+01

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

MOLYBDENUM (Non-Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Molybdenum	1	365	80	5.0E-03		250	1	330	1	1				1E-06	**1.8E+03**

Dermal Contact

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Molybdenum	1	365	80	5.0E-03	1.0E+00	250	1			6032	0.8	*1.0E-02*	1E-06	**1.2E+04**

Inhalation of Particulates

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Molybdenum	1	365	-	1E+06	8	250	1						24	**-**

Total RBC => 1.5E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

NICKEL (Non-Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Nickel	1	365	80	*1.1E-02*		250	1	330	1	1				1E-06	**3.9E+03**

Dermal Contact

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Nickel	1	365	80	*1.1E-02*	4.0E-02	250	1			6032	0.8	*1.0E-02*	1E-06	**1.1E+03**

Inhalation of Particulates

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Nickel	1	365	*1.4E-05*	1E+06	8	250	1						24	**6.1E+01**

Total RBC => 5.7E+01

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

SELENIUM (Non-Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Selenium	1	365	80	5.0E-03	250	1	330	1	1	1E-06	**1.8E+03**

Dermal Contact

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Selenium	1	365	80	5.0E-03	1.0E+00	250	1	6032	0.8	*1.0E-02*	1E-06	**1.2E+04**

Inhalation of Particulates

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Selenium	1	365	2.0E-02	1E+06	8	250	1	24	**8.8E+04**

Total RBC => 1.5E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

SILVER (Non-Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Silver	1	365	80	5.0E-03		250	1	330	1	1				1E-06	**1.8E+03**

Dermal Contact

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Silver	1	365	80	5.0E-03	1.0E+00	250	1			6032	0.8	*1.0E-02*	1E-06	**1.2E+04**

Inhalation of Particulates

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Silver	1	365	-	1E+06	8	250	1						24	**-**

Total RBC => 1.5E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

ZINC (Non-Cancer Endpoint)

Construction Worker RBCs (Pathway-specific and total; in mg/kg)

Soil Ingestion

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)		EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)				CF (kg/mg)	**RBC (mg/kg)**
Zinc	1	365	80	3.0E-01		250	1	330	1	1				1E-06	**1.1E+05**

Dermal Contact

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)			SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Zinc	1	365	80	3.0E-01	1.0E+00	250	1			6032	0.8	*1.0E-02*	1E-06	**7.3E+05**

Inhalation of Particulates

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)						CF (hr/day)	**RBC (mg/kg)**
Zinc	1	365	-	1E+06	8	250	1						24	**-**

Total RBC => 9.3E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).
Receptor-specific EF value is yellow-shaded. All other values are default values for residential receptor.

ATTACHMENT D

ABBREVIATIONS

COPC	chemical of potential concern
TR	target incremental lifetime cancer risk (1E-05 per BLM, 2004)
THQ	target hazard quotient (1E+00 per BLM, 2004)
AT (d)	averaging time (days)
BW (kg)	body weight (kilograms)
RfDo (mg/kg-d)	oral reference dose (milligram per kilogram per day)
EF (d/yr)	exposure frequency (days per year)
ED (yr)	exposure duration (years)
IR (mg/d)	ingestion rate (milligrams per day)
B oral (-)	bioavailability (dimensionless)
FI (-)	fraction ingested (dimensionless)
CF (kg/mg)	conversion factor (kilogram per milligram)
RBC (mg/kg)	risk-based concentration (milligram per kilogram)
GIABS	gastrointestinal absorption factor (dimensionless)
SA (cm2)	surface area (square centimeters)
AF (mg/cm2)	adherence factor (milligram per square centimeter)
ABS (-)	absorption factor (dimensionless)
RfC (mg/m3)	reference concentration (milligram per cubic meter)
REL (mg/m3)	reference exposure level (milligram per cubic meter)
PEF (m3/kg)	particulate emission factor (cubic meters per kilogram)
ET (hr/d)	exposure time (hours per day)
IFS (mg/kg)	receptor-weighted ingestion factor for soil (milligrams per kilogram)
DFS (mg/kg)	receptor-weighted dermal factor for soil (milligrams per kilogram)

ARSENIC (Cancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo $(mg/kg\text{-}d)^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1E-05	25550	15 80	*9.5E+00*	350	6 20	200 100	0.6	1	**36750**	1E-06	**1.2E+00**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo $(mg/kg\text{-}d)^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1E-05	25550	15 80	*9.5E+00*	1.0E+00	350	6 20	*2900* 6032	0.2 0.07	3.0E-02	**118146**	1E-06	**7.6E+00**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR $(ug/m3)^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Arsenic	1E-05	25550	*3.3E-03*	1.36E+09	24	350	26	24	1000	**1.2E+04**

Total RBC => 1.1E+00

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.

BERYLLIUM (Cancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1E-05	25550	15 80	-	350	6 20	200 100	1	1	**36750**	1E-06	**-**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1E-05	25550	15 80	-	7.0E-03	350	6 20	*2900* 6032	0.2 0.07	*1.0E-02*	**118146**	1E-06	**-**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Beryllium	1E-05	25550	2.4E-03	1.36E+09	24	350	26	24	1000	**1.6E+04**

Total RBC => 1.6E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

CADMIUM (Cancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1E-05	25550	15 80	-	350	6 20	200 100	1	1	**36750**	1E-06	**-**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1E-05	25550	15 80	-	1.0E+00	350	6 20	*2900* 6032	0.2 0.07	1.0E-03	**118146**	1E-06	**-**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Cadmium	1E-05	25550	*4.2E-03*	1.36E+09	24	350	*30*	24	1000	**7.9E+03**

Total RBC => 7.9E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.

COBALT (Cancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1E-05	25550	15 80	-	350	6 20	200 100	1	1	**36750**	1E-06	**-**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1E-05	25550	15 80	-	1.0E+00	350	6 20	*2900* 6032	0.2 0.07	*1.0E-02*	**118146**	1E-06	**-**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Cobalt	1E-05	25550	9.0E-03	1.36E+09	24	350	26	24	1000	**4.2E+03**

Total RBC => 4.2E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

NICKEL (Cancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	**IFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Nickel	1E-05	25550	15 80	-	350	6 20	200 100	1	1	**36750**	1E-06	**-**

Dermal Contact (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	BW (kg)	SFo (mg/kg-d)$^{-1}$	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	**DFS (mg/kg)**	CF (kg/mg)	**RBC (mg/kg)**
Nickel	1E-05	25550	15 80	-	1.0E+00	350	6 20	*2900* 6032	0.2 0.07	*1.0E-02*	**118146**	1E-06	**-**

Inhalation of Particulates (age 0-6 yrs and 7-26 yrs)

COPC	TR	AT (d)	IUR (ug/m3)$^{-1}$	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF1 (hr/day)	CF2 (ug/mg)	**RBC (mg/kg)**
Nickel	1E-05	25550	2.6E-04	1.36E+09	24	350	26	24	1000	**1.5E+05**

Total RBC => 1.5E+05

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

ANTIMONY (Noncancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Antimony	1	2190	15	4.0E-04	350	6	200	1	1	1E-06	**3.1E+01**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Antimony	1	2190	15	4.0E-04	1.5E-01	350	6	*2900*	0.2	*1.0E-02*	1E-06	**1.6E+02**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Antimony	1	2190	-	1.36E+09	24	350	6	24	**-**

Total RBC => 2.6E+01

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

ARSENIC (Noncancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1	2190	15	*3.5E-06*	350	6	200	0.6	1	1E-06	**4.6E-01**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Arsenic	1	2190	15	*3.5E-06*	1.0E+00	350	6	*2900*	0.2	3.0E-02	1E-06	**3.1E+00**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Arsenic	1	2190	1.5E-05	1.36E+09	24	350	6	24	**2.1E+04**

Total RBC => 4.0E-01

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.

BARIUM (Noncancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Barium	1	2190	15	2.0E-01	350	6	200	1	1	1E-06	**1.6E+04**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Barium	1	2190	15	2.0E-01	7.0E-02	350	6	*2900*	0.2	*1.0E-02*	1E-06	**3.8E+04**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Barium	1	2190	5.0E-04	1.36E+09	24	350	6	24	**7.1E+05**

Total RBC => 1.1E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

BERYLLIUM (Noncancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1	2190	15	*2.0E-04*	350	6	200	1	1	1E-06	**1.6E+01**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Beryllium	1	2190	15	*2.0E-04*	7.0E-03	350	6	*2900*	0.2	*1.0E-02*	1E-06	**3.8E+00**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Beryllium	1	2190	*7.0E-06*	1.36E+09	24	350	6	24	**9.9E+03**

Total RBC => 3.0E+00

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

CADMIUM (Noncancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-30 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1	10950	*80*	*6.3E-06*	350	*30*	*100*	1	1	1E-06	**5.3E+00**

Dermal Contact (age 0-30 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Cadmium	1	10950	*80*	*6.3E-06*	2.5E-02	350	*30*	*6032*	*0.07*	1.0E-03	1E-06	**3.1E+01**

Inhalation of Particulates (age 0-30 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Cadmium	1	10950	1.0E-05	1.36E+09	24	350	*30*	24	**1.4E+04**

Total RBC => 4.5E+00

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.

COBALT (Noncancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1	2190	15	3.0E-04	350	6	200	1	1	1E-06	**2.3E+01**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Cobalt	1	2190	15	3.0E-04	1.0E+00	350	6	*2900*	0.2	*1.0E-02*	1E-06	**8.1E+02**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Cobalt	1	2190	6.0E-06	1.36E+09	24	350	6	24	**8.5E+03**

Total RBC => 2.3E+01

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

COPPER (Noncancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Copper	1	2190	15	4.0E-02	350	6	200	1	1	1E-06	**3.1E+03**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Copper	1	2190	15	4.0E-02	1.0E+00	350	6	*2900*	0.2	*1.0E-02*	1E-06	**1.1E+05**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Copper	1	2190	-	1.36E+09	24	350	6	24	**-**

Total RBC => 3.0E+03

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

MERCURY (Noncancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Mercury	1	2190	15	3.0E-04	350	6	200	1	1	1E-06	**2.3E+01**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Mercury	1	2190	15	3.0E-04	7.0E-02	350	6	*2900*	0.2	*1.0E-02*	1E-06	**5.7E+01**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Mercury	1	2190	3.0E-04	1.36E+09	24	350	6	24	**4.3E+05**

Total RBC => 1.7E+01

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

MOLYBDENUM (Noncancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Molybdenum	1	2190	15	5.0E-03	350	6	200	1	1	1E-06	**3.9E+02**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Molybdenum	1	2190	15	5.0E-03	1.0E+00	350	6	*2900*	0.2	*1.0E-02*	1E-06	**1.3E+04**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Molybdenum	1	2190	-	1.36E+09	24	350	6	24	**-**

Total RBC => 3.8E+02

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

NICKEL (Noncancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Nickel	1	2190	15	*1.1E-02*	350	6	200	1	1	1E-06	**8.6E+02**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Nickel	1	2190	15	*1.1E-02*	4.0E-02	350	6	*2900*	0.2	*1.0E-02*	1E-06	**1.2E+03**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Nickel	1	2190	*1.4E-05*	1.36E+09	24	350	6	24	**2.0E+04**

Total RBC => 4.9E+02

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

SELENIUM (Noncancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Selenium	1	2190	15	5.0E-03	350	6	200	1	1	1E-06	**3.9E+02**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Selenium	1	2190	15	5.0E-03	1.0E+00	350	6	*2900*	0.2	*1.0E-02*	1E-06	**1.3E+04**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Selenium	1	2190	2.0E-02	1.36E+09	24	350	6	24	**2.8E+07**

Total RBC => 3.8E+02

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

SILVER (Noncancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Silver	1	2190	15	5.0E-03	350	6	200	1	1	1E-06	**3.9E+02**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Silver	1	2190	15	5.0E-03	1.0E+00	350	6	*2900*	0.2	*1.0E-02*	1E-06	**1.3E+04**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Silver	1	2190	-	1.36E+09	24	350	6	24	**-**

Total RBC => 3.8E+02

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

ZINC (Noncancer Endpoint)

Residential RBCs (Pathway-specific and total; in mg/kg)

~ based on HERO Note 3 (May 2015) ~

Soil Ingestion (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	EF (d/yr)	ED (yr)	IR (mg/d)	B oral (-)	FI (-)	CF (kg/mg)	**RBC (mg/kg)**
Zinc	1	2190	15	3.0E-01	350	6	200	1	1	1E-06	**2.3E+04**

Dermal Contact (age 0-6 yrs)

COPC	THQ	AT (d)	BW (kg)	RfDo (mg/kg-d)	GIABS	EF (d/yr)	ED (yr)	SA (cm^2)	AF (mg/cm^2)	ABS (-)	CF (kg/mg)	**RBC (mg/kg)**
Zinc	1	2190	15	3.0E-01	1.0E+00	350	6	*2900*	0.2	*1.0E-02*	1E-06	**8.1E+05**

Inhalation of Particulates (age 0-6 yrs)

COPC	THQ	AT (d)	RfC or REL (mg/m3)	PEF (m^3/kg)	ET (hr/d)	EF (d/yr)	ED (yr)	CF (hr/day)	**RBC (mg/kg)**
Zinc	1	2190	-	1.36E+09	24	350	6	24	**-**

Total RBC => 2.3E+04

Chemical-specific values are gray-shaded.
Italicized values are CalEPA values that differ from those used by USEPA to derive RSLs.
ABS value from Table 1 of PEA Manual (DTSC, 2013).

ATTACHMENT E

LEAD RISK ASSESSMENT SPREADSHEET 8 - RECREATIONAL USER (CHILD)

CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

Click here for ABBREVIATED INSTRUCTIONS FOR LEADSPREAD 8

INPUT	
MEDIUM	LEVEL
Lead in Soil/Dust (ug/g)	702
Respirable Dust (ug/m^3)	1.5

OUTPUT						
Percentile Estimate of Blood Pb (ug/dl)						PRG-90
	50th	90th	95th	98th	99th	(ug/g)
BLOOD Pb, CHILD	0.5	1.0	1.2	1.4	1.6	702
BLOOD Pb, PICA CHILD	1.1	2.0	2.4	2.9	3.3	352

EXPOSURE PARAMETERS		
	units	children
Days per week	**days/wk**	**0.77**
Geometric Standard Deviation		1.6
Blood lead level of concern (ug/dl)		1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

PATHWAYS						
CHILDREN	typical			with pica		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	6.4E-6	0.00	0.82%		0.00	0%
Soil Ingestion	7.7E-4	0.54	99.16%	1.5E-3	1.09	100%
Inhalation	2.2E-7	0.00	0.03%		0.00	0%

Click here for REFERENCES

LEAD RISK ASSESSMENT SPREADSHEET 8 - RECREATIONAL CABIN OCCUPANT (CHILD)

CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

Click here for ABBREVIATED INSTRUCTIONS FOR LEADSPREAD 8

INPUT	
MEDIUM	LEVEL
Lead in Soil/Dust (ug/g)	585
Respirable Dust (ug/m^3)	1.5

OUTPUT						
Percentile Estimate of Blood Pb (ug/dl)						PRG-90
	50th	90th	95th	98th	99th	(ug/g)
BLOOD Pb, CHILD	0.5	1.0	1.2	1.4	1.6	585
BLOOD Pb, PICA CHILD	1.1	2.0	2.4	2.9	3.3	294

EXPOSURE PARAMETERS		
	units	children
Days per week	**days/wk**	**0.92**
Geometric Standard Deviation		1.6
Blood lead level of concern (ug/dl)		1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

PATHWAYS						
CHILDREN	typical			with pica		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	7.6E-6	0.00	0.82%		0.00	0%
Soil Ingestion	9.3E-4	0.54	99.16%	1.9E-3	1.09	100%
Inhalation	2.6E-7	0.00	0.03%		0.00	0%

Click here for REFERENCES

MODIFIED VERSION OF USEPA ADULT LEAD MODEL

CONSTRUCTION WORKER

CALCULATIONS OF BLOOD LEAD CONCENTRATIONS (PbBs) AND PRELMIINARY REMEDIATION GOAL (PRG)

EDIT RED CELL

Variable	Description of Variable	Units	
PbS	Soil lead concentration	ug/g or ppm	318
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4
GSD_i	Geometric standard deviation PbB	--	1.8
PbB_0	Baseline PbB	ug/dL	0.0
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S, D}$	Exposure frequency (same for soil and dust)	days/yr	250
$AT_{S, D}$	Averaging time (same for soil and dust)	days/yr	365
PbB_{adult}	**PbB of adult worker, geometric mean**	**ug/dL**	**0.5**
$PbB_{fetal, 0.90}$	90th percentile PbB among fetuses of adult workers	ug/dL	1.0
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	**1.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**10.0%**

PRG90 **318**

LEAD RISK ASSESSMENT SPREADSHEET 8 - RESIDENTIAL (CHILD)

CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

Click here for ABBREVIATED INSTRUCTIONS FOR LEADSPREAD 8

INPUT	
MEDIUM	LEVEL
Lead in Soil/Dust (ug/g)	77
Respirable Dust (ug/m^3)	1.5

OUTPUT						
Percentile Estimate of Blood Pb (ug/dl)						PRG-90
	50th	90th	95th	98th	99th	(ug/g)
BLOOD Pb, CHILD	0.5	1.0	1.2	1.4	1.6	77
BLOOD Pb, PICA CHILD	1.1	2.0	2.4	2.9	3.3	39

EXPOSURE PARAMETERS		
	units	children
Days per week	**days/wk**	**7.00**
Geometric Standard Deviation		1.6
Blood lead level of concern (ug/dl)		1
Skin area, residential	cm^2	2900
Soil adherence	ug/cm^2	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001
Soil ingestion	mg/day	100
Soil ingestion, pica	mg/day	200
Ingestion constant	(ug/dl)/(ug/day)	0.16
Bioavailability	unitless	0.44
Breathing rate	m^3/day	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.192

PATHWAYS						
CHILDREN	typical			with pica		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	5.8E-5	0.00	0.82%		0.00	0%
Soil Ingestion	7.0E-3	0.54	99.16%	1.4E-2	1.08	100%
Inhalation	2.0E-6	0.00	0.03%		0.00	0%

Click here for REFERENCES

ATTACHMENT F

Risk Calculations for Recreational User Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	230	4.2	25	19	0.71	23
Arsenic	19	12	84	36	9.7	28
Barium	210	230	1,000	950	150	750
Beryllium	*0.12*	0.27	0.17	0.21	0.24	0.17
Cadmium	0.62	0.15	2.4	1.4	0.18	0.97
Cobalt	17	5.4	3.7	4.9	5.6	4.9
Copper	190	21	130	100	12	58
Lead	2,500	150	430	380	18	600
Mercury	52	210	260	2,200	2.4	51
Molybdenum	0.83	0.37	5.3	2.6	0.34	0.87
Nickel	34	16	11	17	19	15
Selenium	0.8	0.17	6.6	2.7	*0.11*	1.2
Silver	5.4	3.8	85	64	2.6	9.3
Zinc	570	42	150	110	48	160

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	0.531	230	4.2	25	19	0.71	23
Arsenic	13.3	19	-	84	36	-	28
Barium	281	-	-	1000	950	-	750
Beryllium	0.118	0.12	0.27	0.17	0.21	0.24	0.17
Cadmium	0.172	0.62	-	2.4	1.4	0.18	0.97
Cobalt	7.19	17	-	-	-	-	-
Copper	13.0	190	21	130	100	-	58
Lead	11.5	2500	150	430	380	18	600
Mercury	0.418	52	210	260	2200	2.4	51
Molybdenum	0.650	0.83	-	5.3	2.6	-	0.87
Nickel	25.5	34	-	-	-	-	-
Selenium	1.08	-	-	6.6	2.7	-	1.2
Silver	0.534	5.4	3.8	85	64	2.6	9.3
Zinc	60.6	570	-	150	110	-	160

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	2.3E+02	1.0E+00	1.8E-02	1.1E-01	8.3E-02	3.1E-03	1.0E-01
Arsenic	3.5E+00	5.4E+00	-	2.4E+01	1.0E+01	-	8.0E+00
Barium	9.5E+04	-	-	1.0E-02	1.0E-02	-	7.9E-03
Beryllium	2.7E+01	4.5E-03	1.0E-02	6.4E-03	7.9E-03	9.0E-03	6.4E-03
Cadmium	3.9E+01	1.6E-02	-	6.1E-02	3.6E-02	4.6E-03	2.5E-02
Cobalt	2.0E+02	8.5E-02	-	-	-	-	-
Copper	2.7E+04	7.1E-03	7.9E-04	4.9E-03	3.8E-03	-	2.2E-03
Lead	-	-	-	-	-	-	-
Mercury	1.5E+02	3.6E-01	1.4E+00	1.8E+00	1.5E+01	1.7E-02	3.5E-01
Molybdenum	3.3E+03	2.5E-04	-	1.6E-03	7.8E-04	-	2.6E-04
Nickel	4.3E+03	8.0E-03	-	-	-	-	-
Selenium	3.3E+03	-	-	2.0E-03	8.1E-04	-	3.6E-04
Silver	3.3E+03	1.6E-03	1.1E-03	2.6E-02	1.9E-02	7.8E-04	2.8E-03
Zinc	2.0E+05	2.9E-03	-	7.5E-04	5.5E-04	-	8.0E-04
	HI =>	**6.9E+00**	**1.5E+00**	**2.6E+01**	**2.6E+01**	**3.4E-02**	**8.5E+00**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	-	-	-	-	-	-	-
Arsenic	9.2E+00	2E-05	-	9E-05	4E-05	-	3E-05
Barium	-	-	-	-	-	-	-
Beryllium	1.4E+05	9E-12	2E-11	1E-11	2E-11	2E-11	1E-11
Cadmium	6.9E+04	9E-11	-	3E-10	2E-10	3E-11	1E-10
Cobalt	3.7E+04	5E-09	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.3E+06	3E-10	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**2E-05**	**2E-11**	**9E-05**	**4E-05**	**4E-11**	**3E-05**

Risk Calculations for Recreational User Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	1.0	4.0	35	5.1	0.28	0.55
Arsenic	11	15	210	12	4.4	9.1
Barium	220	240	1,300	250	160	140
Beryllium	0.2	0.12	0.12	0.2	0.16	0.19
Cadmium	0.31	0.99	1.5	1.0	0.25	0.48
Cobalt	6.0	5.7	1.1	6.1	4.2	4.5
Copper	95	69	240	59	8.3	17
Lead	39	220	750	180	9.9	17
Mercury	58	31	27	150	0.98	18
Molybdenum	0.46	1.5	21	0.55	0.45	0.69
Nickel	21	16	2.3	21	9	13
Selenium	0.34	0.61	14	0.57	0.14	0.38
Silver	2.2	8.0	140	6.8	0.58	2.7
Zinc	55	120	370	100	43	63

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	0.531	1	4	35	5.1	-	0.55
Arsenic	13.3	-	15	210	-	-	-
Barium	281	-	-	1300	-	-	-
Beryllium	0.118	0.2	0.12	0.12	0.2	0.16	0.19
Cadmium	0.172	0.31	0.99	1.5	1	0.25	0.48
Cobalt	7.19	-	-	-	-	-	-
Copper	13.0	95	69	240	59	-	17
Lead	11.5	39	220	750	180	-	17
Mercury	0.418	58	31	27	150	0.98	18
Molybdenum	0.650	-	1.5	21	-	-	0.69
Nickel	25.5	-	-	-	-	-	-
Selenium	1.08	-	-	14	-	-	-
Silver	0.534	2.2	8	140	6.8	0.58	2.7
Zinc	60.6	-	120	370	100	-	63

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	2.3E+02	4.4E-03	1.7E-02	1.5E-01	2.2E-02	-	2.4E-03
Arsenic	3.5E+00	-	4.3E+00	6.0E+01	-	-	-
Barium	9.5E+04	-	-	1.4E-02	-	-	-
Beryllium	2.7E+01	7.5E-03	4.5E-03	4.5E-03	7.5E-03	6.0E-03	7.1E-03
Cadmium	3.9E+01	7.9E-03	2.5E-02	3.8E-02	2.5E-02	6.4E-03	1.2E-02
Cobalt	2.0E+02	-	-	-	-	-	-
Copper	2.7E+04	3.6E-03	2.6E-03	9.0E-03	2.2E-03	-	6.4E-04
Lead	-	-	-	-	-	-	-
Mercury	1.5E+02	4.0E-01	2.1E-01	1.9E-01	1.0E+00	6.8E-03	1.2E-01
Molybdenum	3.3E+03	-	4.5E-04	6.3E-03	-	-	2.1E-04
Nickel	4.3E+03	-	-	-	-	-	-
Selenium	3.3E+03	-	-	4.2E-03	-	-	-
Silver	3.3E+03	6.6E-04	2.4E-03	4.2E-02	2.0E-03	1.7E-04	8.1E-04
Zinc	2.0E+05	-	6.0E-04	1.9E-03	5.0E-04	-	3.2E-04
	HI =>	**4.2E-01**	**4.6E+00**	**6.1E+01**	**1.1E+00**	**1.9E-02**	**1.5E-01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	-	-	-	-	-	-	-
Arsenic	9.2E+00	-	2E-05	2E-04	-	-	-
Barium	-	-	-	-	-	-	-
Beryllium	1.4E+05	1E-11	9E-12	9E-12	1E-11	1E-11	1E-11
Cadmium	6.9E+04	4E-11	1E-10	2E-10	1E-10	4E-11	7E-11
Cobalt	3.7E+04	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.3E+06	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**6E-11**	**2E-05**	**2E-04**	**2E-10**	**5E-11**	**8E-11**

Risk Calculations for Recreational User Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	0.19	1.0	*0.072*	*0.059*	*0.064*	1.3
Arsenic	4.0	26	3.3	6.1	7.4	30
Barium	100	120	49	88	110	260
Beryllium	0.12	*0.069*	0.11	0.17	*0.025*	*0.03*
Cadmium	0.35	0.39	0.071	0.11	0.083	0.34
Cobalt	4.5	3.8	4.3	4.3	5.8	7.4
Copper	9.1	12	5.2	6.7	8.5	21
Lead	44	32	2.7	8.8	5.6	91
Mercury	3.9	23	0.54	0.75	0.55	1.8
Molybdenum	0.55	0.42	0.3	0.45	0.28	0.47
Nickel	8.7	8.5	16	12	16	28
Selenium	0.17	0.44	*0.13*	*0.11*	*0.12*	0.28
Silver	0.43	7.7	0.064	0.31	0.098	2.3
Zinc	63	46	24	29	29	75

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	0.531	-	1	-	-	-	1.3
Arsenic	13.3	-	26	-	-	-	30
Barium	281	-	-	-	-	-	-
Beryllium	0.118	0.12	-	-	0.17	-	-
Cadmium	0.172	0.35	0.39	-	-	-	0.34
Cobalt	7.19	-	-	-	-	-	7.4
Copper	13.0	-	-	-	-	-	21
Lead	11.5	44	32	-	-	-	91
Mercury	0.418	3.9	23	0.54	0.75	0.55	1.8
Molybdenum	0.650	-	-	-	-	-	-
Nickel	25.5	-	-	-	-	-	28
Selenium	1.08	-	-	-	-	-	-
Silver	0.534	-	7.7	-	-	-	2.3
Zinc	60.6	63	-	-	-	-	75

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	2.3E+02	-	4.4E-03	-	-	-	5.7E-03
Arsenic	3.5E+00	-	7.5E+00	-	-	-	8.6E+00
Barium	9.5E+04	-	-	-	-	-	-
Beryllium	2.7E+01	4.5E-03	-	-	6.4E-03	-	-
Cadmium	3.9E+01	8.9E-03	9.9E-03	-	-	-	8.6E-03
Cobalt	2.0E+02	-	-	-	-	-	3.7E-02
Copper	2.7E+04	-	-	-	-	-	7.9E-04
Lead	-	-	-	-	-	-	-
Mercury	1.5E+02	2.7E-02	1.6E-01	3.7E-03	5.2E-03	3.8E-03	1.2E-02
Molybdenum	3.3E+03	-	-	-	-	-	-
Nickel	4.3E+03	-	-	-	-	-	6.6E-03
Selenium	3.3E+03	-	-	-	-	-	-
Silver	3.3E+03	-	2.3E-03	-	-	-	6.9E-04
Zinc	2.0E+05	3.2E-04	-	-	-	-	3.8E-04
	HI =>	**4.1E-02**	**7.6E+00**	**3.7E-03**	**1.2E-02**	**3.8E-03**	**8.7E+00**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	-	-	-	-	-	-	-
Arsenic	9.2E+00	-	3E-05	-	-	-	3E-05
Barium	-	-	-	-	-	-	-
Beryllium	1.4E+05	9E-12	-	-	1E-11	-	-
Cadmium	6.9E+04	5E-11	6E-11	-	-	-	5E-11
Cobalt	3.7E+04	-	-	-	-	-	2E-09
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.3E+06	-	-	-	-	-	2E-10
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**6E-11**	**3E-05**	**0E+00**	**1E-11**	**0E+00**	**3E-05**

Risk Calculations for Recreational User Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	1	0.47	*0.075*	*0.07*	*0.073*	5.8
Arsenic	11	9.6	6.4	4.6	6.4	30
Barium	290	97	87	74	84	720
Beryllium	*0.03*	0.031	*0.03*	0.036	*0.029*	0.029
Cadmium	0.28	0.11	0.086	0.14	0.2	1.3
Cobalt	8.6	4.3	3.7	4.2	3.2	4.1
Copper	18	11	6	11	11	42
Lead	51	170	8.3	17	9.6	93
Mercury	4	9.3	0.77	0.58	8.7	120
Molybdenum	0.53	0.58	0.52	0.78	0.55	1.9
Nickel	30	9.1	8.4	9.4	9.4	9.5
Selenium	0.17	0.25	*0.14*	*0.13*	0.16	2.2
Silver	3.1	2.7	0.13	0.19	0.89	15
Zinc	77	36	31	20	39	130

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	0.531	1	-	-	-	-	5.8
Arsenic	13.3	-	-	-	-	-	30
Barium	281	290	-	-	-	-	720
Beryllium	0.118	-	-	-	-	-	-
Cadmium	0.172	0.28	-	-	-	0.2	1.3
Cobalt	7.19	8.6	-	-	-	-	-
Copper	13.0	18	-	-	-	-	42
Lead	11.5	51	170	-	17	-	93
Mercury	0.418	4	9.3	0.77	0.58	8.7	120
Molybdenum	0.650	-	-	-	0.78	-	1.9
Nickel	25.5	30	-	-	-	-	-
Selenium	1.08	-	-	-	-	-	2.2
Silver	0.534	3.1	2.7	-	-	0.89	15
Zinc	60.6	77	-	-	-	-	130

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	2.3E+02	4.4E-03	-	-	-	-	2.5E-02
Arsenic	3.5E+00	-	-	-	-	-	8.6E+00
Barium	9.5E+04	3.0E-03	-	-	-	-	7.6E-03
Beryllium	2.7E+01	-	-	-	-	-	-
Cadmium	3.9E+01	7.1E-03	-	-	-	5.1E-03	3.3E-02
Cobalt	2.0E+02	4.3E-02	-	-	-	-	-
Copper	2.7E+04	6.8E-04	-	-	-	-	1.6E-03
Lead	-	-	-	-	-	-	-
Mercury	1.5E+02	2.8E-02	6.4E-02	5.3E-03	4.0E-03	6.0E-02	8.3E-01
Molybdenum	3.3E+03	-	-	-	2.3E-04	-	5.7E-04
Nickel	4.3E+03	7.0E-03	-	-	-	-	-
Selenium	3.3E+03	-	-	-	-	-	6.6E-04
Silver	3.3E+03	9.3E-04	8.1E-04	-	-	2.7E-04	4.5E-03
Zinc	2.0E+05	3.9E-04	-	-	-	-	6.5E-04
	HI =>	**9.4E-02**	**6.5E-02**	**5.3E-03**	**4.2E-03**	**6.5E-02**	**9.5E+00**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	-	-	-	-	-	-	-
Arsenic	9.2E+00	-	-	-	-	-	3E-05
Barium	-	-	-	-	-	-	-
Beryllium	1.4E+05	-	-	-	-	-	-
Cadmium	6.9E+04	4E-11	-	-	-	3E-11	2E-10
Cobalt	3.7E+04	2E-09	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.3E+06	2E-10	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**3E-09**	**0E+00**	**0E+00**	**0E+00**	**3E-11**	**3E-05**

Risk Calculations for Recreational User Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	*0.066*	*0.07*	*0.057*	5.6	0.31	5.4
Arsenic	4.4	4.5	5.9	25	4.6	39
Barium	76	97	87	450	99	520
Beryllium	*0.026*	*0.028*	*0.022*	0.039	0.18	*0.027*
Cadmium	0.12	0.16	0.13	0.69	0.17	1.1
Cobalt	4.8	4.4	6.1	5.2	4.8	3.9
Copper	6.2	9.2	9.4	36	8.3	45
Lead	10	17	7.1	97	11	110
Mercury	3.2	14	0.61	42	2.1	120
Molybdenum	0.37	0.49	0.33	2	0.52	1.8
Nickel	15	15	21	13	14	12
Selenium	0.14	0.17	*0.1*	1.5	*0.14*	2.4
Silver	0.21	0.053	0.12	12	0.36	19
Zinc	34	34	37	74	33	110

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	0.531	-	-	-	5.6	-	5.4
Arsenic	13.3	-	-	-	25	-	39
Barium	281	-	-	-	450	-	520
Beryllium	0.118	-	-	-	-	0.18	-
Cadmium	0.172	-	-	-	0.69	-	1.1
Cobalt	7.19	-	-	-	-	-	-
Copper	13.0	-	-	-	36	-	45
Lead	11.5	-	17	-	97	-	110
Mercury	0.418	3.2	14	0.61	42	2.1	120
Molybdenum	0.650	-	-	-	2	-	1.8
Nickel	25.5	-	-	-	-	-	-
Selenium	1.08	-	-	-	1.5	-	2.4
Silver	0.534	-	-	-	12	-	19
Zinc	60.6	-	-	-	74	-	110

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	2.3E+02	-	-	-	2.4E-02	-	2.4E-02
Arsenic	3.5E+00	-	-	-	7.2E+00	-	1.1E+01
Barium	9.5E+04	-	-	-	4.7E-03	-	5.5E-03
Beryllium	2.7E+01	-	-	-	-	6.8E-03	-
Cadmium	3.9E+01	-	-	-	1.8E-02	-	2.8E-02
Cobalt	2.0E+02	-	-	-	-	-	-
Copper	2.7E+04	-	-	-	1.4E-03	-	1.7E-03
Lead	-	-	-	-	-	-	-
Mercury	1.5E+02	2.2E-02	9.6E-02	4.2E-03	2.9E-01	1.4E-02	8.3E-01
Molybdenum	3.3E+03	-	-	-	6.0E-04	-	5.4E-04
Nickel	4.3E+03	-	-	-	-	-	-
Selenium	3.3E+03	-	-	-	4.5E-04	-	7.2E-04
Silver	3.3E+03	-	-	-	3.6E-03	-	5.7E-03
Zinc	2.0E+05	-	-	-	3.7E-04	-	5.5E-04
	HI =>	**2.2E-02**	**9.6E-02**	**4.2E-03**	**7.5E+00**	**2.1E-02**	**1.2E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	-	-	-	-	-	-	-
Arsenic	9.2E+00	-	-	-	3E-05	-	4E-05
Barium	-	-	-	-	-	-	-
Beryllium	1.4E+05	-	-	-	-	1E-11	-
Cadmium	6.9E+04	-	-	-	1E-10	-	2E-10
Cobalt	3.7E+04	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.3E+06	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**0E+00**	**0E+00**	**0E+00**	**3E-05**	**1E-11**	**4E-05**

Risk Calculations for Recreational User Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	*0.071*	4.2	1.3	0.67	6.6	0.57	0.98
Arsenic	3.1	10	8.4	6.8	24	4.3	6.4
Barium	73	390	200	94	630	85	91
Beryllium	*0.028*	*0.022*	0.28	0.33	0.19	0.15	0.13
Cadmium	0.085	0.39	0.27	0.12	0.78	0.15	0.15
Cobalt	4.6	3.9	5	6.9	3.9	3.7	4.1
Copper	5.1	21	15	8.8	33	8.5	17
Lead	4.1	50	49	8.7	98	12	240
Mercury	0.88	140	14	4	72	0.62	2
Molybdenum	0.39	0.73	1.8	0.79	2.1	0.45	0.42
Nickel	13	14	12	19	13	10	7.8
Selenium	*0.13*	0.59	0.21	*0.098*	1.3	*0.12*	*0.15*
Silver	*0.21*	6.3	3	0.68	9.8	0.3	1.5
Zinc	37	64	63	40	79	40	63

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	0.531	-	4.2	1.3	0.67	6.6	0.57	0.98
Arsenic	13.3	-	-	-	-	24	-	-
Barium	281	-	390	-	-	630	-	-
Beryllium	0.118	-	-	0.28	0.33	0.19	0.15	0.13
Cadmium	0.172	-	0.39	0.27	-	0.78	-	-
Cobalt	7.19	-	-	-	-	-	-	-
Copper	13.0	-	21	15	-	33	-	17
Lead	11.5	-	50	49	-	98	12	240
Mercury	0.418	0.88	140	14	4	72	0.62	2
Molybdenum	0.650	-	0.73	1.8	0.79	2.1	-	-
Nickel	25.5	-	-	-	-	-	-	-
Selenium	1.08	-	-	-	-	1.3	-	-
Silver	0.534	-	6.3	3	0.68	9.8	-	1.5
Zinc	60.6	-	64	63	-	79	-	63

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	2.3E+02	-	1.8E-02	5.7E-03	2.9E-03	2.9E-02	2.5E-03	4.3E-03
Arsenic	3.5E+00	-	-	-	-	6.9E+00	-	-
Barium	9.5E+04	-	4.1E-03	-	-	6.6E-03	-	-
Beryllium	2.7E+01	-	-	1.1E-02	1.2E-02	7.1E-03	5.6E-03	4.9E-03
Cadmium	3.9E+01	-	9.9E-03	6.9E-03	-	2.0E-02	-	-
Cobalt	2.0E+02	-	-	-	-	-	-	-
Copper	2.7E+04	-	7.9E-04	5.6E-04	-	1.2E-03	-	6.4E-04
Lead	-	-	-	-	-	-	-	-
Mercury	1.5E+02	6.1E-03	9.6E-01	9.6E-02	2.8E-02	5.0E-01	4.3E-03	1.4E-02
Molybdenum	3.3E+03	-	2.2E-04	5.4E-04	2.4E-04	6.3E-04	-	-
Nickel	4.3E+03	-	-	-	-	-	-	-
Selenium	3.3E+03	-	-	-	-	3.9E-04	-	-
Silver	3.3E+03	-	1.9E-03	9.0E-04	2.0E-04	2.9E-03	-	4.5E-04
Zinc	2.0E+05	-	3.2E-04	3.2E-04	-	4.0E-04	-	3.2E-04
	HI =>	**6.1E-03**	**1.0E+00**	**1.2E-01**	**4.3E-02**	**7.4E+00**	**1.2E-02**	**2.4E-02**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	-	-	-	-	-	-	-	-
Arsenic	9.2E+00	-	-	-	-	3E-05	-	-
Barium	-	-	-	-	-	-	-	-
Beryllium	1.4E+05	-	-	2E-11	2E-11	1E-11	1E-11	9E-12
Cadmium	6.9E+04	-	6E-11	4E-11	-	1E-10	-	-
Cobalt	3.7E+04	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-
Nickel	1.3E+06	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-
	ILCR =>	**0E+00**	**6E-11**	**6E-11**	**2E-11**	**3E-05**	**1E-11**	**9E-12**

Risk Calculations for Recreational Cabin Occupant Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	230	4.2	25	19	0.71	23
Arsenic	19	12	84	36	9.7	28
Barium	210	230	1,000	950	150	750
Beryllium	*0.12*	0.27	0.17	0.21	0.24	0.17
Cadmium	0.62	0.15	2.4	1.4	0.18	0.97
Cobalt	17	5.4	3.7	4.9	5.6	4.9
Copper	190	21	130	100	12	58
Lead	2,500	150	430	380	18	600
Mercury	52	210	260	2,200	2.4	51
Molybdenum	0.83	0.37	5.3	2.6	0.34	0.87
Nickel	34	16	11	17	19	15
Selenium	0.8	0.17	6.6	2.7	*0.11*	1.2
Silver	5.4	3.8	85	64	2.6	9.3
Zinc	570	42	150	110	48	160

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	0.531	230	4.2	25	19	0.71	23
Arsenic	13.3	19	-	84	36	-	28
Barium	281	-	-	1000	950	-	750
Beryllium	0.118	0.12	0.27	0.17	0.21	0.24	0.17
Cadmium	0.172	0.62	-	2.4	1.4	0.18	0.97
Cobalt	7.19	17	-	-	-	-	-
Copper	13.0	190	21	130	100	-	58
Lead	11.5	2500	150	430	380	18	600
Mercury	0.418	52	210	260	2200	2.4	51
Molybdenum	0.650	0.83	-	5.3	2.6	-	0.87
Nickel	25.5	34	-	-	-	-	-
Selenium	1.08	-	-	6.6	2.7	-	1.2
Silver	0.534	5.4	3.8	85	64	2.6	9.3
Zinc	60.6	570	-	150	110	-	160

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	1.9E+02	1.2E+00	2.2E-02	1.3E-01	9.9E-02	3.7E-03	1.2E-01
Arsenic	2.9E+00	6.5E+00	-	2.9E+01	1.2E+01	-	9.6E+00
Barium	7.9E+04	-	-	1.3E-02	1.2E-02	-	9.4E-03
Beryllium	2.2E+01	5.4E-03	1.2E-02	7.7E-03	9.5E-03	1.1E-02	7.7E-03
Cadmium	3.3E+01	1.9E-02	-	7.3E-02	4.3E-02	5.5E-03	3.0E-02
Cobalt	1.7E+02	1.0E-01	-	-	-	-	-
Copper	2.2E+04	8.6E-03	9.5E-04	5.9E-03	4.5E-03	-	2.6E-03
Lead	-	-	-	-	-	-	-
Mercury	1.2E+02	4.3E-01	1.7E+00	2.1E+00	1.8E+01	2.0E-02	4.2E-01
Molybdenum	2.8E+03	3.0E-04	-	1.9E-03	9.4E-04	-	3.1E-04
Nickel	3.5E+03	9.6E-03	-	-	-	-	-
Selenium	2.8E+03	-	-	2.4E-03	9.7E-04	-	4.3E-04
Silver	2.8E+03	1.9E-03	1.4E-03	3.1E-02	2.3E-02	9.4E-04	3.4E-03
Zinc	1.7E+05	3.4E-03	-	9.0E-04	6.6E-04	-	9.6E-04
	HI =>	**8.3E+00**	**1.8E+00**	**3.1E+01**	**3.1E+01**	**4.1E-02**	**1.0E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	-	-	-	-	-	-	-
Arsenic	7.7E+00	2E-05	-	1E-04	5E-05	-	4E-05
Barium	-	-	-	-	-	-	-
Beryllium	1.2E+05	1E-11	2E-11	1E-11	2E-11	2E-11	1E-11
Cadmium	5.7E+04	1E-10	-	4E-10	2E-10	3E-11	2E-10
Cobalt	3.1E+04	5E-09	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.1E+06	3E-10	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**2E-05**	**2E-11**	**1E-04**	**5E-05**	**5E-11**	**4E-05**

Risk Calculations for Recreational Cabin Occupant Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	1.0	4.0	35	5.1	0.28	0.55
Arsenic	11	15	210	12	4.4	9.1
Barium	220	240	1,300	250	160	140
Beryllium	0.2	0.12	0.12	0.2	0.16	0.19
Cadmium	0.31	0.99	1.5	1.0	0.25	0.48
Cobalt	6.0	5.7	1.1	6.1	4.2	4.5
Copper	95	69	240	59	8.3	17
Lead	39	220	750	180	9.9	17
Mercury	58	31	27	150	0.98	18
Molybdenum	0.46	1.5	21	0.55	0.45	0.69
Nickel	21	16	2.3	21	9	13
Selenium	0.34	0.61	14	0.57	0.14	0.38
Silver	2.2	8.0	140	6.8	0.58	2.7
Zinc	55	120	370	100	43	63

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	0.531	1	4	35	5.1	-	0.55
Arsenic	13.3	-	15	210	-	-	-
Barium	281	-	-	1300	-	-	-
Beryllium	0.118	0.2	0.12	0.12	0.2	0.16	0.19
Cadmium	0.172	0.31	0.99	1.5	1	0.25	0.48
Cobalt	7.19	-	-	-	-	-	-
Copper	13.0	95	69	240	59	-	17
Lead	11.5	39	220	750	180	-	17
Mercury	0.418	58	31	27	150	0.98	18
Molybdenum	0.650	-	1.5	21	-	-	0.69
Nickel	25.5	-	-	-	-	-	-
Selenium	1.08	-	-	14	-	-	-
Silver	0.534	2.2	8	140	6.8	0.58	2.7
Zinc	60.6	-	120	370	100	-	63

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	1.9E+02	5.2E-03	2.1E-02	1.8E-01	2.7E-02	-	2.9E-03
Arsenic	2.9E+00	-	5.2E+00	7.2E+01	-	-	-
Barium	7.9E+04	-	-	1.6E-02	-	-	-
Beryllium	2.2E+01	9.0E-03	5.4E-03	5.4E-03	9.0E-03	7.2E-03	8.6E-03
Cadmium	3.3E+01	9.5E-03	3.0E-02	4.6E-02	3.1E-02	7.6E-03	1.5E-02
Cobalt	1.7E+02	-	-	-	-	-	-
Copper	2.2E+04	4.3E-03	3.1E-03	1.1E-02	2.7E-03	-	7.7E-04
Lead	-	-	-	-	-	-	-
Mercury	1.2E+02	4.8E-01	2.6E-01	2.2E-01	1.2E+00	8.1E-03	1.5E-01
Molybdenum	2.8E+03	-	5.4E-04	7.6E-03	-	-	2.5E-04
Nickel	3.5E+03	-	-	-	-	-	-
Selenium	2.8E+03	-	-	5.1E-03	-	-	-
Silver	2.8E+03	7.9E-04	2.9E-03	5.1E-02	2.5E-03	2.1E-04	9.7E-04
Zinc	1.7E+05	-	7.2E-04	2.2E-03	6.0E-04	-	3.8E-04
	HI =>	**5.1E-01**	**5.5E+00**	**7.3E+01**	**1.3E+00**	**2.3E-02**	**1.8E-01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	-	-	-	-	-	-	-
Arsenic	7.7E+00	-	2E-05	3E-04	-	-	-
Barium	-	-	-	-	-	-	-
Beryllium	1.2E+05	2E-11	1E-11	1E-11	2E-11	1E-11	2E-11
Cadmium	5.7E+04	5E-11	2E-10	3E-10	2E-10	4E-11	8E-11
Cobalt	3.1E+04	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.1E+06	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**7E-11**	**2E-05**	**3E-04**	**2E-10**	**6E-11**	**1E-10**

Risk Calculations for Recreational Cabin Occupant Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	0.19	1.0	*0.072*	*0.059*	*0.064*	1.3
Arsenic	4.0	26	3.3	6.1	7.4	30
Barium	100	120	49	88	110	260
Beryllium	0.12	*0.069*	0.11	0.17	*0.025*	*0.03*
Cadmium	0.35	0.39	0.071	0.11	0.083	0.34
Cobalt	4.5	3.8	4.3	4.3	5.8	7.4
Copper	9.1	12	5.2	6.7	8.5	21
Lead	44	32	2.7	8.8	5.6	91
Mercury	3.9	23	0.54	0.75	0.55	1.8
Molybdenum	0.55	0.42	0.3	0.45	0.28	0.47
Nickel	8.7	8.5	16	12	16	28
Selenium	0.17	0.44	*0.13*	*0.11*	*0.12*	0.28
Silver	0.43	7.7	0.064	0.31	0.098	2.3
Zinc	63	46	24	29	29	75

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	0.531	-	1	-	-	-	1.3
Arsenic	13.3	-	26	-	-	-	30
Barium	281	-	-	-	-	-	-
Beryllium	0.118	0.12	-	-	0.17	-	-
Cadmium	0.172	0.35	0.39	-	-	-	0.34
Cobalt	7.19	-	-	-	-	-	7.4
Copper	13.0	-	-	-	-	-	21
Lead	11.5	44	32	-	-	-	91
Mercury	0.418	3.9	23	0.54	0.75	0.55	1.8
Molybdenum	0.650	-	-	-	-	-	-
Nickel	25.5	-	-	-	-	-	28
Selenium	1.08	-	-	-	-	-	-
Silver	0.534	-	7.7	-	-	-	2.3
Zinc	60.6	63	-	-	-	-	75

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	1.9E+02	-	5.2E-03	-	-	-	6.8E-03
Arsenic	2.9E+00	-	8.9E+00	-	-	-	1.0E+01
Barium	7.9E+04	-	-	-	-	-	-
Beryllium	2.2E+01	5.4E-03	-	-	7.7E-03	-	-
Cadmium	3.3E+01	1.1E-02	1.2E-02	-	-	-	1.0E-02
Cobalt	1.7E+02	-	-	-	-	-	4.5E-02
Copper	2.2E+04	-	-	-	-	-	9.5E-04
Lead	-	-	-	-	-	-	-
Mercury	1.2E+02	3.2E-02	1.9E-01	4.5E-03	6.2E-03	4.5E-03	1.5E-02
Molybdenum	2.8E+03	-	-	-	-	-	-
Nickel	3.5E+03	-	-	-	-	-	7.9E-03
Selenium	2.8E+03	-	-	-	-	-	-
Silver	2.8E+03	-	2.8E-03	-	-	-	8.3E-04
Zinc	1.7E+05	3.8E-04	-	-	-	-	4.5E-04
	HI =>	**4.9E-02**	**9.2E+00**	**4.5E-03**	**1.4E-02**	**4.5E-03**	**1.0E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	-	-	-	-	-	-	-
Arsenic	7.7E+00	-	3E-05	-	-	-	4E-05
Barium	-	-	-	-	-	-	-
Beryllium	1.2E+05	1E-11	-	-	1E-11	-	-
Cadmium	5.7E+04	6E-11	7E-11	-	-	-	6E-11
Cobalt	3.1E+04	-	-	-	-	-	2E-09
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.1E+06	-	-	-	-	-	3E-10
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**7E-11**	**3E-05**	**0E+00**	**1E-11**	**0E+00**	**4E-05**

Risk Calculations for Recreational Cabin Occupant Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	1	0.47	*0.075*	*0.07*	*0.073*	5.8
Arsenic	11	9.6	6.4	4.6	6.4	30
Barium	290	97	87	74	84	720
Beryllium	*0.03*	0.031	*0.03*	0.036	*0.029*	0.029
Cadmium	0.28	0.11	0.086	0.14	0.2	1.3
Cobalt	8.6	4.3	3.7	4.2	3.2	4.1
Copper	18	11	6	11	11	42
Lead	51	170	8.3	17	9.6	93
Mercury	4	9.3	0.77	0.58	8.7	120
Molybdenum	0.53	0.58	0.52	0.78	0.55	1.9
Nickel	30	9.1	8.4	9.4	9.4	9.5
Selenium	0.17	0.25	*0.14*	*0.13*	0.16	2.2
Silver	3.1	2.7	0.13	0.19	0.89	15
Zinc	77	36	31	20	39	130

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	0.531	1	-	-	-	-	5.8
Arsenic	13.3	-	-	-	-	-	30
Barium	281	290	-	-	-	-	720
Beryllium	0.118	-	-	-	-	-	-
Cadmium	0.172	0.28	-	-	-	0.2	1.3
Cobalt	7.19	8.6	-	-	-	-	-
Copper	13.0	18	-	-	-	-	42
Lead	11.5	51	170	-	17	-	93
Mercury	0.418	4	9.3	0.77	0.58	8.7	120
Molybdenum	0.650	-	-	-	0.78	-	1.9
Nickel	25.5	30	-	-	-	-	-
Selenium	1.08	-	-	-	-	-	2.2
Silver	0.534	3.1	2.7	-	-	0.89	15
Zinc	60.6	77	-	-	-	-	130

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	1.9E+02	5.2E-03	-	-	-	-	3.0E-02
Arsenic	2.9E+00	-	-	-	-	-	1.0E+01
Barium	7.9E+04	3.7E-03	-	-	-	-	9.1E-03
Beryllium	2.2E+01	-	-	-	-	-	-
Cadmium	3.3E+01	8.5E-03	-	-	-	6.1E-03	4.0E-02
Cobalt	1.7E+02	5.2E-02	-	-	-	-	-
Copper	2.2E+04	8.1E-04	-	-	-	-	1.9E-03
Lead	-	-	-	-	-	-	-
Mercury	1.2E+02	3.3E-02	7.7E-02	6.4E-03	4.8E-03	7.2E-02	9.9E-01
Molybdenum	2.8E+03	-	-	-	2.8E-04	-	6.9E-04
Nickel	3.5E+03	8.5E-03	-	-	-	-	-
Selenium	2.8E+03	-	-	-	-	-	7.9E-04
Silver	2.8E+03	1.1E-03	9.7E-04	-	-	3.2E-04	5.4E-03
Zinc	1.7E+05	4.6E-04	-	-	-	-	7.8E-04
	HI =>	**1.1E-01**	**7.8E-02**	**6.4E-03**	**5.1E-03**	**7.8E-02**	**1.1E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	-	-	-	-	-	-	-
Arsenic	7.7E+00	-	-	-	-	-	4E-05
Barium	-	-	-	-	-	-	-
Beryllium	1.2E+05	-	-	-	-	-	-
Cadmium	5.7E+04	5E-11	-	-	-	3E-11	2E-10
Cobalt	3.1E+04	3E-09	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.1E+06	3E-10	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**3E-09**	**0E+00**	**0E+00**	**0E+00**	**3E-11**	**4E-05**

Risk Calculations for Recreational Cabin Occupant Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	*0.066*	*0.07*	*0.057*	5.6	0.31	5.4
Arsenic	4.4	4.5	5.9	25	4.6	39
Barium	76	97	87	450	99	520
Beryllium	*0.026*	*0.028*	*0.022*	0.039	0.18	*0.027*
Cadmium	0.12	0.16	0.13	0.69	0.17	1.1
Cobalt	4.8	4.4	6.1	5.2	4.8	3.9
Copper	6.2	9.2	9.4	36	8.3	45
Lead	10	17	7.1	97	11	110
Mercury	3.2	14	0.61	42	2.1	120
Molybdenum	0.37	0.49	0.33	2	0.52	1.8
Nickel	15	15	21	13	14	12
Selenium	0.14	0.17	*0.1*	1.5	*0.14*	2.4
Silver	0.21	0.053	0.12	12	0.36	19
Zinc	34	34	37	74	33	110

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	0.531	-	-	-	5.6	-	5.4
Arsenic	13.3	-	-	-	25	-	39
Barium	281	-	-	-	450	-	520
Beryllium	0.118	-	-	-	-	0.18	-
Cadmium	0.172	-	-	-	0.69	-	1.1
Cobalt	7.19	-	-	-	-	-	-
Copper	13.0	-	-	-	36	-	45
Lead	11.5	-	17	-	97	-	110
Mercury	0.418	3.2	14	0.61	42	2.1	120
Molybdenum	0.650	-	-	-	2	-	1.8
Nickel	25.5	-	-	-	-	-	-
Selenium	1.08	-	-	-	1.5	-	2.4
Silver	0.534	-	-	-	12	-	19
Zinc	60.6	-	-	-	74	-	110

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	1.9E+02	-	-	-	2.9E-02	-	2.8E-02
Arsenic	2.9E+00	-	-	-	8.6E+00	-	1.3E+01
Barium	7.9E+04	-	-	-	5.7E-03	-	6.5E-03
Beryllium	2.2E+01	-	-	-	-	8.1E-03	-
Cadmium	3.3E+01	-	-	-	2.1E-02	-	3.4E-02
Cobalt	1.7E+02	-	-	-	-	-	-
Copper	2.2E+04	-	-	-	1.6E-03	-	2.0E-03
Lead	-	-	-	-	-	-	-
Mercury	1.2E+02	2.6E-02	1.2E-01	5.0E-03	3.5E-01	1.7E-02	9.9E-01
Molybdenum	2.8E+03	-	-	-	7.2E-04	-	6.5E-04
Nickel	3.5E+03	-	-	-	-	-	-
Selenium	2.8E+03	-	-	-	5.4E-04	-	8.7E-04
Silver	2.8E+03	-	-	-	4.3E-03	-	6.9E-03
Zinc	1.7E+05	-	-	-	4.5E-04	-	6.6E-04
	HI =>	**2.6E-02**	**1.2E-01**	**5.0E-03**	**9.0E+00**	**2.5E-02**	**1.4E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	-	-	-	-	-	-	-
Arsenic	7.7E+00	-	-	-	3E-05	-	5E-05
Barium	-	-	-	-	-	-	-
Beryllium	1.2E+05	-	-	-	-	2E-11	-
Cadmium	5.7E+04	-	-	-	1E-10	-	2E-10
Cobalt	3.1E+04	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.1E+06	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**0E+00**	**0E+00**	**0E+00**	**3E-05**	**2E-11**	**5E-05**

Risk Calculations for Recreational Cabin Occupant Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	*0.071*	4.2	1.3	0.67	6.6	0.57	0.98
Arsenic	3.1	10	8.4	6.8	24	4.3	6.4
Barium	73	390	200	94	630	85	91
Beryllium	*0.028*	*0.022*	0.28	0.33	0.19	0.15	0.13
Cadmium	0.085	0.39	0.27	0.12	0.78	0.15	0.15
Cobalt	4.6	3.9	5	6.9	3.9	3.7	4.1
Copper	5.1	21	15	8.8	33	8.5	17
Lead	4.1	50	49	8.7	98	12	240
Mercury	0.88	140	14	4	72	0.62	2
Molybdenum	0.39	0.73	1.8	0.79	2.1	0.45	0.42
Nickel	13	14	12	19	13	10	7.8
Selenium	*0.13*	0.59	0.21	*0.098*	1.3	*0.12*	*0.15*
Silver	*0.21*	6.3	3	0.68	9.8	0.3	1.5
Zinc	37	64	63	40	79	40	63

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	0.531	-	4.2	1.3	0.67	6.6	0.57	0.98
Arsenic	13.3	-	-	-	-	24	-	-
Barium	281	-	390	-	-	630	-	-
Beryllium	0.118	-	-	0.28	0.33	0.19	0.15	0.13
Cadmium	0.172	-	0.39	0.27	-	0.78	-	-
Cobalt	7.19	-	-	-	-	-	-	-
Copper	13.0	-	21	15	-	33	-	17
Lead	11.5	-	50	49	-	98	12	240
Mercury	0.418	0.88	140	14	4	72	0.62	2
Molybdenum	0.650	-	0.73	1.8	0.79	2.1	-	-
Nickel	25.5	-	-	-	-	-	-	-
Selenium	1.08	-	-	-	-	1.3	-	-
Silver	0.534	-	6.3	3	0.68	9.8	-	1.5
Zinc	60.6	-	64	63	-	79	-	63

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	1.9E+02	-	2.2E-02	6.8E-03	3.5E-03	3.5E-02	3.0E-03	5.1E-03
Arsenic	2.9E+00	-	-	-	-	8.3E+00	-	-
Barium	7.9E+04	-	4.9E-03	-	-	7.9E-03	-	-
Beryllium	2.2E+01	-	-	1.3E-02	1.5E-02	8.6E-03	6.8E-03	5.9E-03
Cadmium	3.3E+01	-	1.2E-02	8.2E-03	-	2.4E-02	-	-
Cobalt	1.7E+02	-	-	-	-	-	-	-
Copper	2.2E+04	-	9.5E-04	6.8E-04	-	1.5E-03	-	7.7E-04
Lead	-	-	-	-	-	-	-	-
Mercury	1.2E+02	7.3E-03	1.2E+00	1.2E-01	3.3E-02	6.0E-01	5.1E-03	1.7E-02
Molybdenum	2.8E+03	-	2.6E-04	6.5E-04	2.9E-04	7.6E-04	-	-
Nickel	3.5E+03	-	-	-	-	-	-	-
Selenium	2.8E+03	-	-	-	-	4.7E-04	-	-
Silver	2.8E+03	-	2.3E-03	1.1E-03	2.5E-04	3.5E-03	-	5.4E-04
Zinc	1.7E+05	-	3.8E-04	3.8E-04	-	4.8E-04	-	3.8E-04
	HI =>	**7.3E-03**	**1.2E+00**	**1.5E-01**	**5.2E-02**	**8.9E+00**	**1.5E-02**	**2.9E-02**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	-	-	-	-	-	-	-	-
Arsenic	7.7E+00	-	-	-	-	3E-05	-	-
Barium	-	-	-	-	-	-	-	-
Beryllium	1.2E+05	-	-	2E-11	3E-11	2E-11	1E-11	1E-11
Cadmium	5.7E+04	-	7E-11	5E-11	-	1E-10	-	-
Cobalt	3.1E+04	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-
Nickel	1.1E+06	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-
	ILCR =>	**0E+00**	**7E-11**	**7E-11**	**3E-11**	**3E-05**	**1E-11**	**1E-11**

Risk Calculations for Construction Worker Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	230	4.2	25	19	0.71	23
Arsenic	19	12	84	36	9.7	28
Barium	210	230	1,000	950	150	750
Beryllium	*0.12*	0.27	0.17	0.21	0.24	0.17
Cadmium	0.62	0.15	2.4	1.4	0.18	0.97
Cobalt	17	5.4	3.7	4.9	5.6	4.9
Copper	190	21	130	100	12	58
Lead	2,500	150	430	380	18	600
Mercury	52	210	260	2,200	2.4	51
Molybdenum	0.83	0.37	5.3	2.6	0.34	0.87
Nickel	34	16	11	17	19	15
Selenium	0.8	0.17	6.6	2.7	*0.11*	1.2
Silver	5.4	3.8	85	64	2.6	9.3
Zinc	570	42	150	110	48	160

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	0.531	230	4.2	25	19	0.71	23
Arsenic	13.3	19	-	84	36	-	28
Barium	281	-	-	1000	950	-	750
Beryllium	0.118	0.12	0.27	0.17	0.21	0.24	0.17
Cadmium	0.172	0.62	-	2.4	1.4	0.18	0.97
Cobalt	7.19	17	-	-	-	-	-
Copper	13.0	190	21	130	100	-	58
Lead	11.5	2500	150	430	380	18	600
Mercury	0.418	52	210	260	2200	2.4	51
Molybdenum	0.650	0.83	-	5.3	2.6	-	0.87
Nickel	25.5	34	-	-	-	-	-
Selenium	1.08	-	-	6.6	2.7	-	1.2
Silver	0.534	5.4	3.8	85	64	2.6	9.3
Zinc	60.6	570	-	150	110	-	160

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	7.2E+01	3.2E+00	5.9E-02	3.5E-01	2.7E-01	9.9E-03	3.2E-01
Arsenic	1.2E+00	1.6E+01	-	7.0E+01	3.0E+01	-	2.3E+01
Barium	2.0E+03	-	-	5.0E-01	4.8E-01	-	3.8E-01
Beryllium	2.9E+00	4.1E-02	9.2E-02	5.8E-02	7.2E-02	8.2E-02	5.8E-02
Cadmium	1.4E+00	4.5E-01	-	1.8E+00	1.0E+00	1.3E-01	7.1E-01
Cobalt	2.0E+01	8.3E-01	-	-	-	-	-
Copper	1.2E+04	1.5E-02	1.7E-03	1.1E-02	8.1E-03	-	4.7E-03
Lead	-	-	-	-	-	-	-
Mercury	3.3E+01	1.6E+00	6.3E+00	7.8E+00	6.6E+01	7.2E-02	1.5E+00
Molybdenum	1.5E+03	5.4E-04	-	3.4E-03	1.7E-03	-	5.6E-04
Nickel	5.7E+01	6.0E-01	-	-	-	-	-
Selenium	1.5E+03	-	-	4.4E-03	1.8E-03	-	7.9E-04
Silver	1.5E+03	3.5E-03	2.5E-03	5.5E-02	4.1E-02	1.7E-03	6.0E-03
Zinc	9.3E+04	6.2E-03	-	1.6E-03	1.2E-03	-	1.7E-03
	HI =>	**2.3E+01**	**6.4E+00**	**8.1E+01**	**9.8E+01**	**3.0E-01**	**2.6E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	-	-	-	-	-	-	-
Arsenic	2.4E+01	8E-06	-	3E-05	1E-05	-	1E-05
Barium	-	-	-	-	-	-	-
Beryllium	1.3E+03	9E-10	2E-09	1E-09	2E-09	2E-09	1E-09
Cadmium	7.3E+02	8E-09	-	3E-08	2E-08	2E-09	1E-08
Cobalt	3.4E+02	5E-07	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.2E+04	3E-08	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**8E-06**	**2E-09**	**3E-05**	**1E-05**	**4E-09**	**1E-05**

Risk Calculations for Construction Worker Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	1.0	4.0	35	5.1	0.28	0.55
Arsenic	11	15	210	12	4.4	9.1
Barium	220	240	1,300	250	160	140
Beryllium	0.2	0.12	0.12	0.2	0.16	0.19
Cadmium	0.31	0.99	1.5	1.0	0.25	0.48
Cobalt	6.0	5.7	1.1	6.1	4.2	4.5
Copper	95	69	240	59	8.3	17
Lead	39	220	750	180	9.9	17
Mercury	58	31	27	150	0.98	18
Molybdenum	0.46	1.5	21	0.55	0.45	0.69
Nickel	21	16	2.3	21	9	13
Selenium	0.34	0.61	14	0.57	0.14	0.38
Silver	2.2	8.0	140	6.8	0.58	2.7
Zinc	55	120	370	100	43	63

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	0.531	1	4	35	5.1	-	0.55
Arsenic	13.3	-	15	210	-	-	-
Barium	281	-	-	1300	-	-	-
Beryllium	0.118	0.2	0.12	0.12	0.2	0.16	0.19
Cadmium	0.172	0.31	0.99	1.5	1	0.25	0.48
Cobalt	7.19	-	-	-	-	-	-
Copper	13.0	95	69	240	59	-	17
Lead	11.5	39	220	750	180	-	17
Mercury	0.418	58	31	27	150	0.98	18
Molybdenum	0.650	-	1.5	21	-	-	0.69
Nickel	25.5	-	-	-	-	-	-
Selenium	1.08	-	-	14	-	-	-
Silver	0.534	2.2	8	140	6.8	0.58	2.7
Zinc	60.6	-	120	370	100	-	63

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	7.2E+01	1.4E-02	5.6E-02	4.9E-01	7.1E-02	-	7.7E-03
Arsenic	1.2E+00	-	1.3E+01	1.8E+02	-	-	-
Barium	2.0E+03	-	-	6.5E-01	-	-	-
Beryllium	2.9E+00	6.8E-02	4.1E-02	4.1E-02	6.8E-02	5.5E-02	6.5E-02
Cadmium	1.4E+00	2.3E-01	7.3E-01	1.1E+00	7.3E-01	1.8E-01	3.5E-01
Cobalt	2.0E+01	-	-	-	-	-	-
Copper	1.2E+04	7.7E-03	5.6E-03	1.9E-02	4.8E-03	-	1.4E-03
Lead	-	-	-	-	-	-	-
Mercury	3.3E+01	1.7E+00	9.3E-01	8.1E-01	4.5E+00	2.9E-02	5.4E-01
Molybdenum	1.5E+03	-	9.7E-04	1.4E-02	-	-	4.5E-04
Nickel	5.7E+01	-	-	-	-	-	-
Selenium	1.5E+03	-	-	9.2E-03	-	-	-
Silver	1.5E+03	1.4E-03	5.2E-03	9.1E-02	4.4E-03	3.8E-04	1.7E-03
Zinc	9.3E+04	-	1.3E-03	4.0E-03	1.1E-03	-	6.8E-04
	HI =>	**2.1E+00**	**1.4E+01**	**1.8E+02**	**5.4E+00**	**2.7E-01**	**9.7E-01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	-	-	-	-	-	-	-
Arsenic	2.4E+01	-	6E-06	9E-05	-	-	-
Barium	-	-	-	-	-	-	-
Beryllium	1.3E+03	2E-09	9E-10	9E-10	2E-09	1E-09	1E-09
Cadmium	7.3E+02	4E-09	1E-08	2E-08	1E-08	3E-09	7E-09
Cobalt	3.4E+02	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.2E+04	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**6E-09**	**6E-06**	**9E-05**	**2E-08**	**5E-09**	**8E-09**

Risk Calculations for Construction Worker Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	0.19	1.0	*0.072*	*0.059*	*0.064*	1.3
Arsenic	4.0	26	3.3	6.1	7.4	30
Barium	100	120	49	88	110	260
Beryllium	0.12	*0.069*	0.11	0.17	*0.025*	*0.03*
Cadmium	0.35	0.39	0.071	0.11	0.083	0.34
Cobalt	4.5	3.8	4.3	4.3	5.8	7.4
Copper	9.1	12	5.2	6.7	8.5	21
Lead	44	32	2.7	8.8	5.6	91
Mercury	3.9	23	0.54	0.75	0.55	1.8
Molybdenum	0.55	0.42	0.3	0.45	0.28	0.47
Nickel	8.7	8.5	16	12	16	28
Selenium	0.17	0.44	*0.13*	*0.11*	*0.12*	0.28
Silver	0.43	7.7	0.064	0.31	0.098	2.3
Zinc	63	46	24	29	29	75

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	0.531	-	1	-	-	-	1.3
Arsenic	13.3	-	26	-	-	-	30
Barium	281	-	-	-	-	-	-
Beryllium	0.118	0.12	-	-	0.17	-	-
Cadmium	0.172	0.35	0.39	-	-	-	0.34
Cobalt	7.19	-	-	-	-	-	7.4
Copper	13.0	-	-	-	-	-	21
Lead	11.5	44	32	-	-	-	91
Mercury	0.418	3.9	23	0.54	0.75	0.55	1.8
Molybdenum	0.650	-	-	-	-	-	-
Nickel	25.5	-	-	-	-	-	28
Selenium	1.08	-	-	-	-	-	-
Silver	0.534	-	7.7	-	-	-	2.3
Zinc	60.6	63	-	-	-	-	75

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	7.2E+01	-	1.4E-02	-	-	-	1.8E-02
Arsenic	1.2E+00	-	2.2E+01	-	-	-	2.5E+01
Barium	2.0E+03	-	-	-	-	-	-
Beryllium	2.9E+00	4.1E-02	-	-	5.8E-02	-	-
Cadmium	1.4E+00	2.6E-01	2.9E-01	-	-	-	2.5E-01
Cobalt	2.0E+01	-	-	-	-	-	3.6E-01
Copper	1.2E+04	-	-	-	-	-	1.7E-03
Lead	-	-	-	-	-	-	-
Mercury	3.3E+01	1.2E-01	6.9E-01	1.6E-02	2.2E-02	1.6E-02	5.4E-02
Molybdenum	1.5E+03	-	-	-	-	-	-
Nickel	5.7E+01	-	-	-	-	-	4.9E-01
Selenium	1.5E+03	-	-	-	-	-	-
Silver	1.5E+03	-	5.0E-03	-	-	-	1.5E-03
Zinc	9.3E+04	6.8E-04	-	-	-	-	8.1E-04
	HI =>	**4.1E-01**	**2.3E+01**	**1.6E-02**	**8.1E-02**	**1.6E-02**	**2.6E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	-	-	-	-	-	-	-
Arsenic	2.4E+01	-	1E-05	-	-	-	1E-05
Barium	-	-	-	-	-	-	-
Beryllium	1.3E+03	9E-10	-	-	1E-09	-	-
Cadmium	7.3E+02	5E-09	5E-09	-	-	-	5E-09
Cobalt	3.4E+02	-	-	-	-	-	2E-07
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.2E+04	-	-	-	-	-	2E-08
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**6E-09**	**1E-05**	**0E+00**	**1E-09**	**0E+00**	**1E-05**

Risk Calculations for Construction Worker Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	1	0.47	*0.075*	*0.07*	*0.073*	5.8
Arsenic	11	9.6	6.4	4.6	6.4	30
Barium	290	97	87	74	84	720
Beryllium	*0.03*	0.031	*0.03*	0.036	*0.029*	0.029
Cadmium	0.28	0.11	0.086	0.14	0.2	1.3
Cobalt	8.6	4.3	3.7	4.2	3.2	4.1
Copper	18	11	6	11	11	42
Lead	51	170	8.3	17	9.6	93
Mercury	4	9.3	0.77	0.58	8.7	120
Molybdenum	0.53	0.58	0.52	0.78	0.55	1.9
Nickel	30	9.1	8.4	9.4	9.4	9.5
Selenium	0.17	0.25	*0.14*	*0.13*	0.16	2.2
Silver	3.1	2.7	0.13	0.19	0.89	15
Zinc	77	36	31	20	39	130

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	0.531	1	-	-	-	-	5.8
Arsenic	13.3	-	-	-	-	-	30
Barium	281	290	-	-	-	-	720
Beryllium	0.118	-	-	-	-	-	-
Cadmium	0.172	0.28	-	-	-	0.2	1.3
Cobalt	7.19	8.6	-	-	-	-	-
Copper	13.0	18	-	-	-	-	42
Lead	11.5	51	170	-	17	-	93
Mercury	0.418	4	9.3	0.77	0.58	8.7	120
Molybdenum	0.650	-	-	-	0.78	-	1.9
Nickel	25.5	30	-	-	-	-	-
Selenium	1.08	-	-	-	-	-	2.2
Silver	0.534	3.1	2.7	-	-	0.89	15
Zinc	60.6	77	-	-	-	-	130

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	7.2E+01	1.4E-02	-	-	-	-	8.1E-02
Arsenic	1.2E+00	-	-	-	-	-	2.5E+01
Barium	2.0E+03	1.5E-01	-	-	-	-	3.6E-01
Beryllium	2.9E+00	-	-	-	-	-	-
Cadmium	1.4E+00	2.1E-01	-	-	-	1.5E-01	9.5E-01
Cobalt	2.0E+01	4.2E-01	-	-	-	-	-
Copper	1.2E+04	1.5E-03	-	-	-	-	3.4E-03
Lead	-	-	-	-	-	-	-
Mercury	3.3E+01	1.2E-01	2.8E-01	2.3E-02	1.7E-02	2.6E-01	3.6E+00
Molybdenum	1.5E+03	-	-	-	5.1E-04	-	1.2E-03
Nickel	5.7E+01	5.3E-01	-	-	-	-	-
Selenium	1.5E+03	-	-	-	-	-	1.5E-03
Silver	1.5E+03	2.0E-03	1.7E-03	-	-	5.8E-04	9.7E-03
Zinc	9.3E+04	8.3E-04	-	-	-	-	1.4E-03
	HI =>	**1.4E+00**	**2.8E-01**	**2.3E-02**	**1.8E-02**	**4.1E-01**	**3.0E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	-	-	-	-	-	-	-
Arsenic	2.4E+01	-	-	-	-	-	1E-05
Barium	-	-	-	-	-	-	-
Beryllium	1.3E+03	-	-	-	-	-	-
Cadmium	7.3E+02	4E-09	-	-	-	3E-09	2E-08
Cobalt	3.4E+02	3E-07	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.2E+04	3E-08	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**3E-07**	**0E+00**	**0E+00**	**0E+00**	**3E-09**	**1E-05**

Risk Calculations for Construction Worker Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	*0.066*	*0.07*	*0.057*	5.6	0.31	5.4
Arsenic	4.4	4.5	5.9	25	4.6	39
Barium	76	97	87	450	99	520
Beryllium	*0.026*	*0.028*	*0.022*	0.039	0.18	*0.027*
Cadmium	0.12	0.16	0.13	0.69	0.17	1.1
Cobalt	4.8	4.4	6.1	5.2	4.8	3.9
Copper	6.2	9.2	9.4	36	8.3	45
Lead	10	17	7.1	97	11	110
Mercury	3.2	14	0.61	42	2.1	120
Molybdenum	0.37	0.49	0.33	2	0.52	1.8
Nickel	15	15	21	13	14	12
Selenium	0.14	0.17	*0.1*	1.5	*0.14*	2.4
Silver	0.21	0.053	0.12	12	0.36	19
Zinc	34	34	37	74	33	110

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	0.531	-	-	-	5.6	-	5.4
Arsenic	13.3	-	-	-	25	-	39
Barium	281	-	-	-	450	-	520
Beryllium	0.118	-	-	-	-	0.18	-
Cadmium	0.172	-	-	-	0.69	-	1.1
Cobalt	7.19	-	-	-	-	-	-
Copper	13.0	-	-	-	36	-	45
Lead	11.5	-	17	-	97	-	110
Mercury	0.418	3.2	14	0.61	42	2.1	120
Molybdenum	0.650	-	-	-	2	-	1.8
Nickel	25.5	-	-	-	-	-	-
Selenium	1.08	-	-	-	1.5	-	2.4
Silver	0.534	-	-	-	12	-	19
Zinc	60.6	-	-	-	74	-	110

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	7.2E+01	-	-	-	7.8E-02	-	7.5E-02
Arsenic	1.2E+00	-	-	-	2.1E+01	-	3.3E+01
Barium	2.0E+03	-	-	-	2.3E-01	-	2.6E-01
Beryllium	2.9E+00	-	-	-	-	6.2E-02	-
Cadmium	1.4E+00	-	-	-	5.1E-01	-	8.1E-01
Cobalt	2.0E+01	-	-	-	-	-	-
Copper	1.2E+04	-	-	-	2.9E-03	-	3.6E-03
Lead	-	-	-	-	-	-	-
Mercury	3.3E+01	9.6E-02	4.2E-01	1.8E-02	1.3E+00	6.3E-02	3.6E+00
Molybdenum	1.5E+03	-	-	-	1.3E-03	-	1.2E-03
Nickel	5.7E+01	-	-	-	-	-	-
Selenium	1.5E+03	-	-	-	9.9E-04	-	1.6E-03
Silver	1.5E+03	-	-	-	7.8E-03	-	1.2E-02
Zinc	9.3E+04	-	-	-	8.0E-04	-	1.2E-03
	HI =>	**9.6E-02**	**4.2E-01**	**1.8E-02**	**2.3E+01**	**1.2E-01**	**3.7E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	-	-	-	-	-	-	-
Arsenic	2.4E+01	-	-	-	1E-05	-	2E-05
Barium	-	-	-	-	-	-	-
Beryllium	1.3E+03	-	-	-	-	1E-09	-
Cadmium	7.3E+02	-	-	-	9E-09	-	2E-08
Cobalt	3.4E+02	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.2E+04	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**0E+00**	**0E+00**	**0E+00**	**1E-05**	**1E-09**	**2E-05**

Risk Calculations for Construction Worker Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	*0.071*	4.2	1.3	0.67	6.6	0.57	0.98
Arsenic	3.1	10	8.4	6.8	24	4.3	6.4
Barium	73	390	200	94	630	85	91
Beryllium	*0.028*	*0.022*	0.28	0.33	0.19	0.15	0.13
Cadmium	0.085	0.39	0.27	0.12	0.78	0.15	0.15
Cobalt	4.6	3.9	5	6.9	3.9	3.7	4.1
Copper	5.1	21	15	8.8	33	8.5	17
Lead	4.1	50	49	8.7	98	12	240
Mercury	0.88	140	14	4	72	0.62	2
Molybdenum	0.39	0.73	1.8	0.79	2.1	0.45	0.42
Nickel	13	14	12	19	13	10	7.8
Selenium	*0.13*	0.59	0.21	*0.098*	1.3	*0.12*	*0.15*
Silver	*0.21*	6.3	3	0.68	9.8	0.3	1.5
Zinc	37	64	63	40	79	40	63

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	0.531	-	4.2	1.3	0.67	6.6	0.57	0.98
Arsenic	13.3	-	-	-	-	24	-	-
Barium	281	-	390	-	-	630	-	-
Beryllium	0.118	-	-	0.28	0.33	0.19	0.15	0.13
Cadmium	0.172	-	0.39	0.27	-	0.78	-	-
Cobalt	7.19	-	-	-	-	-	-	-
Copper	13.0	-	21	15	-	33	-	17
Lead	11.5	-	50	49	-	98	12	240
Mercury	0.418	0.88	140	14	4	72	0.62	2
Molybdenum	0.650	-	0.73	1.8	0.79	2.1	-	-
Nickel	25.5	-	-	-	-	-	-	-
Selenium	1.08	-	-	-	-	1.3	-	-
Silver	0.534	-	6.3	3	0.68	9.8	-	1.5
Zinc	60.6	-	64	63	-	79	-	63

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	7.2E+01	-	5.9E-02	1.8E-02	9.3E-03	9.2E-02	8.0E-03	1.4E-02
Arsenic	1.2E+00	-	-	-	-	2.0E+01	-	-
Barium	2.0E+03	-	2.0E-01	-	-	3.2E-01	-	-
Beryllium	2.9E+00	-	-	9.6E-02	1.1E-01	6.5E-02	5.1E-02	4.4E-02
Cadmium	1.4E+00	-	2.9E-01	2.0E-01	-	5.7E-01	-	-
Cobalt	2.0E+01	-	-	-	-	-	-	-
Copper	1.2E+04	-	1.7E-03	1.2E-03	-	2.7E-03	-	1.4E-03
Lead	-	-	-	-	-	-	-	-
Mercury	3.3E+01	2.6E-02	4.2E+00	4.2E-01	1.2E-01	2.1E+00	1.9E-02	6.0E-02
Molybdenum	1.5E+03	-	4.7E-04	1.2E-03	5.1E-04	1.4E-03	-	-
Nickel	5.7E+01	-	-	-	-	-	-	-
Selenium	1.5E+03	-	-	-	-	8.6E-04	-	-
Silver	1.5E+03	-	4.1E-03	1.9E-03	4.4E-04	6.3E-03	-	9.7E-04
Zinc	9.3E+04	-	6.9E-04	6.8E-04	-	8.5E-04	-	6.8E-04
	HI =>	**2.6E-02**	**4.7E+00**	**7.3E-01**	**2.4E-01**	**2.3E+01**	**7.8E-02**	**1.2E-01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	-	-	-	-	-	-	-	-
Arsenic	2.4E+01	-	-	-	-	1E-05	-	-
Barium	-	-	-	-	-	-	-	-
Beryllium	1.3E+03	-	-	2E-09	3E-09	1E-09	1E-09	1E-09
Cadmium	7.3E+02	-	5E-09	4E-09	-	1E-08	-	-
Cobalt	3.4E+02	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-
Nickel	1.2E+04	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-
	ILCR =>	**0E+00**	**5E-09**	**6E-09**	**3E-09**	**1E-05**	**1E-09**	**1E-09**

Risk Calculations for Residential Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	230	4.2	25	19	0.71	23
Arsenic	19	12	84	36	9.7	28
Barium	210	230	1,000	950	150	750
Beryllium	*0.12*	0.27	0.17	0.21	0.24	0.17
Cadmium	0.62	0.15	2.4	1.4	0.18	0.97
Cobalt	17	5.4	3.7	4.9	5.6	4.9
Copper	190	21	130	100	12	58
Lead	2,500	150	430	380	18	600
Mercury	52	210	260	2,200	2.4	51
Molybdenum	0.83	0.37	5.3	2.6	0.34	0.87
Nickel	34	16	11	17	19	15
Selenium	0.8	0.17	6.6	2.7	*0.11*	1.2
Silver	5.4	3.8	85	64	2.6	9.3
Zinc	570	42	150	110	48	160

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	0.531	230	4.2	25	19	0.71	23
Arsenic	13.3	19	-	84	36	-	28
Barium	281	-	-	1000	950	-	750
Beryllium	0.118	0.12	0.27	0.17	0.21	0.24	0.17
Cadmium	0.172	0.62	-	2.4	1.4	0.18	0.97
Cobalt	7.19	17	-	-	-	-	-
Copper	13.0	190	21	130	100	-	58
Lead	11.5	2500	150	430	380	18	600
Mercury	0.418	52	210	260	2200	2.4	51
Molybdenum	0.650	0.83	-	5.3	2.6	-	0.87
Nickel	25.5	34	-	-	-	-	-
Selenium	1.08	-	-	6.6	2.7	-	1.2
Silver	0.534	5.4	3.8	85	64	2.6	9.3
Zinc	60.6	570	-	150	110	-	160

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	3.1E+01	7.4E+00	1.4E-01	8.1E-01	6.1E-01	2.3E-02	7.4E-01
Arsenic	4.0E-01	4.8E+01	-	2.1E+02	9.0E+01	-	7.0E+01
Barium	1.5E+04	-	-	6.7E-02	6.3E-02	-	5.0E-02
Beryllium	3.0E+00	4.0E-02	9.0E-02	5.7E-02	7.0E-02	8.0E-02	5.7E-02
Cadmium	4.5E+00	1.4E-01	-	5.3E-01	3.1E-01	4.0E-02	2.2E-01
Cobalt	2.3E+01	7.4E-01	-	-	-	-	-
Copper	3.1E+03	6.1E-02	6.8E-03	4.2E-02	3.2E-02	-	1.9E-02
Lead	-	-	-	-	-	-	-
Mercury	2.3E+01	2.3E+00	9.1E+00	1.1E+01	9.6E+01	1.0E-01	2.2E+00
Molybdenum	3.9E+02	2.1E-03	-	1.4E-02	6.7E-03	-	2.2E-03
Nickel	4.9E+02	7.0E-02	-	-	-	-	-
Selenium	3.9E+02	-	-	1.7E-02	6.9E-03	-	3.1E-03
Silver	3.9E+02	1.4E-02	9.7E-03	2.2E-01	1.6E-01	6.7E-03	2.4E-02
Zinc	2.3E+04	2.5E-02	-	6.5E-03	4.8E-03	-	7.0E-03
	HI =>	**5.8E+01**	**9.4E+00**	**2.2E+02**	**1.9E+02**	**2.5E-01**	**7.3E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-01	MM-S-02	MM-S-03	MM-S-04	MM-S-05	MM-S-06
Antimony	-	-	-	-	-	-	-
Arsenic	1.1E+00	2E-04	-	8E-04	3E-04	-	3E-04
Barium	-	-	-	-	-	-	-
Beryllium	1.6E+04	8E-11	2E-10	1E-10	1E-10	2E-10	1E-10
Cadmium	7.9E+03	8E-10	-	3E-09	2E-09	2E-10	1E-09
Cobalt	4.2E+03	4E-08	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.5E+05	2E-09	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**2E-04**	**2E-10**	**8E-04**	**3E-04**	**4E-10**	**3E-04**

Risk Calculations for Residential Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	1.0	4.0	35	5.1	0.28	0.55
Arsenic	11	15	210	12	4.4	9.1
Barium	220	240	1,300	250	160	140
Beryllium	0.2	0.12	0.12	0.2	0.16	0.19
Cadmium	0.31	0.99	1.5	1.0	0.25	0.48
Cobalt	6.0	5.7	1.1	6.1	4.2	4.5
Copper	95	69	240	59	8.3	17
Lead	39	220	750	180	9.9	17
Mercury	58	31	27	150	0.98	18
Molybdenum	0.46	1.5	21	0.55	0.45	0.69
Nickel	21	16	2.3	21	9	13
Selenium	0.34	0.61	14	0.57	0.14	0.38
Silver	2.2	8.0	140	6.8	0.58	2.7
Zinc	55	120	370	100	43	63

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	0.531	1	4	35	5.1	-	0.55
Arsenic	13.3	-	15	210	-	-	-
Barium	281	-	-	1300	-	-	-
Beryllium	0.118	0.2	0.12	0.12	0.2	0.16	0.19
Cadmium	0.172	0.31	0.99	1.5	1	0.25	0.48
Cobalt	7.19	-	-	-	-	-	-
Copper	13.0	95	69	240	59	-	17
Lead	11.5	39	220	750	180	-	17
Mercury	0.418	58	31	27	150	0.98	18
Molybdenum	0.650	-	1.5	21	-	-	0.69
Nickel	25.5	-	-	-	-	-	-
Selenium	1.08	-	-	14	-	-	-
Silver	0.534	2.2	8	140	6.8	0.58	2.7
Zinc	60.6	-	120	370	100	-	63

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	3.1E+01	3.2E-02	1.3E-01	1.1E+00	1.6E-01	-	1.8E-02
Arsenic	4.0E-01	-	3.8E+01	5.3E+02	-	-	-
Barium	1.5E+04	-	-	8.7E-02	-	-	-
Beryllium	3.0E+00	6.7E-02	4.0E-02	4.0E-02	6.7E-02	5.3E-02	6.3E-02
Cadmium	4.5E+00	6.9E-02	2.2E-01	3.3E-01	2.2E-01	5.6E-02	1.1E-01
Cobalt	2.3E+01	-	-	-	-	-	-
Copper	3.1E+03	3.1E-02	2.2E-02	7.7E-02	1.9E-02	-	5.5E-03
Lead	-	-	-	-	-	-	-
Mercury	2.3E+01	2.5E+00	1.3E+00	1.2E+00	6.5E+00	4.3E-02	7.8E-01
Molybdenum	3.9E+02	-	3.8E-03	5.4E-02	-	-	1.8E-03
Nickel	4.9E+02	-	-	-	-	-	-
Selenium	3.9E+02	-	-	3.6E-02	-	-	-
Silver	3.9E+02	5.6E-03	2.1E-02	3.6E-01	1.7E-02	1.5E-03	6.9E-03
Zinc	2.3E+04	-	5.2E-03	1.6E-02	4.3E-03	-	2.7E-03
	HI =>	**2.7E+00**	**3.9E+01**	**5.3E+02**	**7.0E+00**	**1.5E-01**	**9.9E-01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-07	MM-S-08	MM-S-09	MM-S-10	MM-S-11	MM-S-12
Antimony	-	-	-	-	-	-	-
Arsenic	1.1E+00	-	1E-04	2E-03	-	-	-
Barium	-	-	-	-	-	-	-
Beryllium	1.6E+04	1E-10	8E-11	8E-11	1E-10	1E-10	1E-10
Cadmium	7.9E+03	4E-10	1E-09	2E-09	1E-09	3E-10	6E-10
Cobalt	4.2E+03	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.5E+05	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**5E-10**	**1E-04**	**2E-03**	**1E-09**	**4E-10**	**7E-10**

Risk Calculations for Residential Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	0.19	1.0	*0.072*	*0.059*	*0.064*	1.3
Arsenic	4.0	26	3.3	6.1	7.4	30
Barium	100	120	49	88	110	260
Beryllium	0.12	*0.069*	0.11	0.17	*0.025*	*0.03*
Cadmium	0.35	0.39	0.071	0.11	0.083	0.34
Cobalt	4.5	3.8	4.3	4.3	5.8	7.4
Copper	9.1	12	5.2	6.7	8.5	21
Lead	44	32	2.7	8.8	5.6	91
Mercury	3.9	23	0.54	0.75	0.55	1.8
Molybdenum	0.55	0.42	0.3	0.45	0.28	0.47
Nickel	8.7	8.5	16	12	16	28
Selenium	0.17	0.44	*0.13*	*0.11*	*0.12*	0.28
Silver	0.43	7.7	0.064	0.31	0.098	2.3
Zinc	63	46	24	29	29	75

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	0.531	-	1	-	-	-	1.3
Arsenic	13.3	-	26	-	-	-	30
Barium	281	-	-	-	-	-	-
Beryllium	0.118	0.12	-	-	0.17	-	-
Cadmium	0.172	0.35	0.39	-	-	-	0.34
Cobalt	7.19	-	-	-	-	-	7.4
Copper	13.0	-	-	-	-	-	21
Lead	11.5	44	32	-	-	-	91
Mercury	0.418	3.9	23	0.54	0.75	0.55	1.8
Molybdenum	0.650	-	-	-	-	-	-
Nickel	25.5	-	-	-	-	-	28
Selenium	1.08	-	-	-	-	-	-
Silver	0.534	-	7.7	-	-	-	2.3
Zinc	60.6	63	-	-	-	-	75

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	3.1E+01	-	3.2E-02	-	-	-	4.2E-02
Arsenic	4.0E-01	-	6.5E+01	-	-	-	7.5E+01
Barium	1.5E+04	-	-	-	-	-	-
Beryllium	3.0E+00	4.0E-02	-	-	5.7E-02	-	-
Cadmium	4.5E+00	7.8E-02	8.7E-02	-	-	-	7.6E-02
Cobalt	2.3E+01	-	-	-	-	-	3.2E-01
Copper	3.1E+03	-	-	-	-	-	6.8E-03
Lead	-	-	-	-	-	-	-
Mercury	2.3E+01	1.7E-01	1.0E+00	2.3E-02	3.3E-02	2.4E-02	7.8E-02
Molybdenum	3.9E+02	-	-	-	-	-	-
Nickel	4.9E+02	-	-	-	-	-	5.8E-02
Selenium	3.9E+02	-	-	-	-	-	-
Silver	3.9E+02	-	2.0E-02	-	-	-	5.9E-03
Zinc	2.3E+04	2.7E-03	-	-	-	-	3.3E-03
	HI =>	**2.9E-01**	**6.6E+01**	**2.3E-02**	**8.9E-02**	**2.4E-02**	**7.6E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-13	MM-S-14	MM-S-15	MM-S-16	MM-S-17	MM-S-18
Antimony	-	-	-	-	-	-	-
Arsenic	1.1E+00	-	2E-04	-	-	-	3E-04
Barium	-	-	-	-	-	-	-
Beryllium	1.6E+04	8E-11	-	-	1E-10	-	-
Cadmium	7.9E+03	4E-10	5E-10	-	-	-	4E-10
Cobalt	4.2E+03	-	-	-	-	-	2E-08
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.5E+05	-	-	-	-	-	2E-09
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**5E-10**	**2E-04**	**0E+00**	**1E-10**	**0E+00**	**3E-04**

Risk Calculations for Residential Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	1	0.47	*0.075*	*0.07*	*0.073*	5.8
Arsenic	11	9.6	6.4	4.6	6.4	30
Barium	290	97	87	74	84	720
Beryllium	*0.03*	0.031	*0.03*	0.036	*0.029*	0.029
Cadmium	0.28	0.11	0.086	0.14	0.2	1.3
Cobalt	8.6	4.3	3.7	4.2	3.2	4.1
Copper	18	11	6	11	11	42
Lead	51	170	8.3	17	9.6	93
Mercury	4	9.3	0.77	0.58	8.7	120
Molybdenum	0.53	0.58	0.52	0.78	0.55	1.9
Nickel	30	9.1	8.4	9.4	9.4	9.5
Selenium	0.17	0.25	*0.14*	*0.13*	0.16	2.2
Silver	3.1	2.7	0.13	0.19	0.89	15
Zinc	77	36	31	20	39	130

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	0.531	1	-	-	-	-	5.8
Arsenic	13.3	-	-	-	-	-	30
Barium	281	290	-	-	-	-	720
Beryllium	0.118	-	-	-	-	-	-
Cadmium	0.172	0.28	-	-	-	0.2	1.3
Cobalt	7.19	8.6	-	-	-	-	-
Copper	13.0	18	-	-	-	-	42
Lead	11.5	51	170	-	17	-	93
Mercury	0.418	4	9.3	0.77	0.58	8.7	120
Molybdenum	0.650	-	-	-	0.78	-	1.9
Nickel	25.5	30	-	-	-	-	-
Selenium	1.08	-	-	-	-	-	2.2
Silver	0.534	3.1	2.7	-	-	0.89	15
Zinc	60.6	77	-	-	-	-	130

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	3.1E+01	3.2E-02	-	-	-	-	1.9E-01
Arsenic	4.0E-01	-	-	-	-	-	7.5E+01
Barium	1.5E+04	1.9E-02	-	-	-	-	4.8E-02
Beryllium	3.0E+00	-	-	-	-	-	-
Cadmium	4.5E+00	6.2E-02	-	-	-	4.4E-02	2.9E-01
Cobalt	2.3E+01	3.7E-01	-	-	-	-	-
Copper	3.1E+03	5.8E-03	-	-	-	-	1.4E-02
Lead	-	-	-	-	-	-	-
Mercury	2.3E+01	1.7E-01	4.0E-01	3.3E-02	2.5E-02	3.8E-01	5.2E+00
Molybdenum	3.9E+02	-	-	-	2.0E-03	-	4.9E-03
Nickel	4.9E+02	6.2E-02	-	-	-	-	-
Selenium	3.9E+02	-	-	-	-	-	5.6E-03
Silver	3.9E+02	7.9E-03	6.9E-03	-	-	2.3E-03	3.8E-02
Zinc	2.3E+04	3.3E-03	-	-	-	-	5.7E-03
	HI =>	**7.4E-01**	**4.1E-01**	**3.3E-02**	**2.7E-02**	**4.2E-01**	**8.1E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-19	MM-S-20	MM-S-21	MM-S-22	MM-S-23	MM-S-24
Antimony	-	-	-	-	-	-	-
Arsenic	1.1E+00	-	-	-	-	-	3E-04
Barium	-	-	-	-	-	-	-
Beryllium	1.6E+04	-	-	-	-	-	-
Cadmium	7.9E+03	4E-10	-	-	-	3E-10	2E-09
Cobalt	4.2E+03	2E-08	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.5E+05	2E-09	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**2E-08**	**0E+00**	**0E+00**	**0E+00**	**3E-10**	**3E-04**

Risk Calculations for Residential Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	*0.066*	*0.07*	*0.057*	5.6	0.31	5.4
Arsenic	4.4	4.5	5.9	25	4.6	39
Barium	76	97	87	450	99	520
Beryllium	*0.026*	*0.028*	*0.022*	0.039	0.18	*0.027*
Cadmium	0.12	0.16	0.13	0.69	0.17	1.1
Cobalt	4.8	4.4	6.1	5.2	4.8	3.9
Copper	6.2	9.2	9.4	36	8.3	45
Lead	10	17	7.1	97	11	110
Mercury	3.2	14	0.61	42	2.1	120
Molybdenum	0.37	0.49	0.33	2	0.52	1.8
Nickel	15	15	21	13	14	12
Selenium	0.14	0.17	*0.1*	1.5	*0.14*	2.4
Silver	0.21	0.053	0.12	12	0.36	19
Zinc	34	34	37	74	33	110

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	0.531	-	-	-	5.6	-	5.4
Arsenic	13.3	-	-	-	25	-	39
Barium	281	-	-	-	450	-	520
Beryllium	0.118	-	-	-	-	0.18	-
Cadmium	0.172	-	-	-	0.69	-	1.1
Cobalt	7.19	-	-	-	-	-	-
Copper	13.0	-	-	-	36	-	45
Lead	11.5	-	17	-	97	-	110
Mercury	0.418	3.2	14	0.61	42	2.1	120
Molybdenum	0.650	-	-	-	2	-	1.8
Nickel	25.5	-	-	-	-	-	-
Selenium	1.08	-	-	-	1.5	-	2.4
Silver	0.534	-	-	-	12	-	19
Zinc	60.6	-	-	-	74	-	110

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	3.1E+01	-	-	-	1.8E-01	-	1.7E-01
Arsenic	4.0E-01	-	-	-	6.3E+01	-	9.8E+01
Barium	1.5E+04	-	-	-	3.0E-02	-	3.5E-02
Beryllium	3.0E+00	-	-	-	-	6.0E-02	-
Cadmium	4.5E+00	-	-	-	1.5E-01	-	2.4E-01
Cobalt	2.3E+01	-	-	-	-	-	-
Copper	3.1E+03	-	-	-	1.2E-02	-	1.5E-02
Lead	-	-	-	-	-	-	-
Mercury	2.3E+01	1.4E-01	6.1E-01	2.7E-02	1.8E+00	9.1E-02	5.2E+00
Molybdenum	3.9E+02	-	-	-	5.1E-03	-	4.6E-03
Nickel	4.9E+02	-	-	-	-	-	-
Selenium	3.9E+02	-	-	-	3.8E-03	-	6.2E-03
Silver	3.9E+02	-	-	-	3.1E-02	-	4.9E-02
Zinc	2.3E+04	-	-	-	3.2E-03	-	4.8E-03
	HI =>	**1.4E-01**	**6.1E-01**	**2.7E-02**	**6.5E+01**	**1.5E-01**	**1.0E+02**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-25	MM-S-26	MM-S-27	MM-S-28	MM-S-29	MM-S-30
Antimony	-	-	-	-	-	-	-
Arsenic	1.1E+00	-	-	-	2E-04	-	4E-04
Barium	-	-	-	-	-	-	-
Beryllium	1.6E+04	-	-	-	-	1E-10	-
Cadmium	7.9E+03	-	-	-	9E-10	-	1E-09
Cobalt	4.2E+03	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	1.5E+05	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-
	ILCR =>	**0E+00**	**0E+00**	**0E+00**	**2E-04**	**1E-10**	**4E-04**

Risk Calculations for Residential Receptor
~ SOIL SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	*0.071*	4.2	1.3	0.67	6.6	0.57	0.98
Arsenic	3.1	10	8.4	6.8	24	4.3	6.4
Barium	73	390	200	94	630	85	91
Beryllium	*0.028*	*0.022*	0.28	0.33	0.19	0.15	0.13
Cadmium	0.085	0.39	0.27	0.12	0.78	0.15	0.15
Cobalt	4.6	3.9	5	6.9	3.9	3.7	4.1
Copper	5.1	21	15	8.8	33	8.5	17
Lead	4.1	50	49	8.7	98	12	240
Mercury	0.88	140	14	4	72	0.62	2
Molybdenum	0.39	0.73	1.8	0.79	2.1	0.45	0.42
Nickel	13	14	12	19	13	10	7.8
Selenium	*0.13*	0.59	0.21	*0.098*	1.3	*0.12*	*0.15*
Silver	*0.21*	6.3	3	0.68	9.8	0.3	1.5
Zinc	37	64	63	40	79	40	63

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	0.531	-	4.2	1.3	0.67	6.6	0.57	0.98
Arsenic	13.3	-	-	-	-	24	-	-
Barium	281	-	390	-	-	630	-	-
Beryllium	0.118	-	-	0.28	0.33	0.19	0.15	0.13
Cadmium	0.172	-	0.39	0.27	-	0.78	-	-
Cobalt	7.19	-	-	-	-	-	-	-
Copper	13.0	-	21	15	-	33	-	17
Lead	11.5	-	50	49	-	98	12	240
Mercury	0.418	0.88	140	14	4	72	0.62	2
Molybdenum	0.650	-	0.73	1.8	0.79	2.1	-	-
Nickel	25.5	-	-	-	-	-	-	-
Selenium	1.08	-	-	-	-	1.3	-	-
Silver	0.534	-	6.3	3	0.68	9.8	-	1.5
Zinc	60.6	-	64	63	-	79	-	63

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	3.1E+01	-	1.4E-01	4.2E-02	2.2E-02	2.1E-01	1.8E-02	3.2E-02
Arsenic	4.0E-01	-	-	-	-	6.0E+01	-	-
Barium	1.5E+04	-	2.6E-02	-	-	4.2E-02	-	-
Beryllium	3.0E+00	-	-	9.3E-02	1.1E-01	6.3E-02	5.0E-02	4.3E-02
Cadmium	4.5E+00	-	8.7E-02	6.0E-02	-	1.7E-01	-	-
Cobalt	2.3E+01	-	-	-	-	-	-	-
Copper	3.1E+03	-	6.8E-03	4.8E-03	-	1.1E-02	-	5.5E-03
Lead	-	-	-	-	-	-	-	-
Mercury	2.3E+01	3.8E-02	6.1E+00	6.1E-01	1.7E-01	3.1E+00	2.7E-02	8.7E-02
Molybdenum	3.9E+02	-	1.9E-03	4.6E-03	2.0E-03	5.4E-03	-	-
Nickel	4.9E+02	-	-	-	-	-	-	-
Selenium	3.9E+02	-	-	-	-	3.3E-03	-	-
Silver	3.9E+02	-	1.6E-02	7.7E-03	1.7E-03	2.5E-02	-	3.8E-03
Zinc	2.3E+04	-	2.8E-03	2.7E-03	-	3.4E-03	-	2.7E-03
	HI =>	**3.8E-02**	**6.4E+00**	**8.2E-01**	**3.1E-01**	**6.4E+01**	**9.5E-02**	**1.7E-01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-S-31	MM-S-32	MM-S-33	MM-S-34	MM-S-35	MM-S-36	MM-S-37
Antimony	-	-	-	-	-	-	-	-
Arsenic	1.1E+00	-	-	-	-	2E-04	-	-
Barium	-	-	-	-	-	-	-	-
Beryllium	1.6E+04	-	-	2E-10	2E-10	1E-10	9E-11	8E-11
Cadmium	7.9E+03	-	5E-10	3E-10	-	1E-09	-	-
Cobalt	4.2E+03	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-
Nickel	1.5E+05	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-
	ILCR =>	**0E+00**	**5E-10**	**5E-10**	**2E-10**	**2E-04**	**9E-11**	**8E-11**

ATTACHMENT G

Risk Calculations for Recreational User Receptor
~ SEDIMENT SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	0.34	0.24	0.93	2.4	2.7	6.2	0.3
Arsenic	50	36	8.7	8.9	16	17	5.7
Barium	81	38	280	210	270	400	86
Beryllium	*0.091*	0.032	0.12	0.14	0.19	0.14	0.061
Cadmium	0.18	0.22	1.2	0.29	0.93	1.4	0.24
Cobalt	2.8	2.2	7	7.2	6.9	4.7	3.0
Copper	5.2	5.1	19	30	78	85	7
Lead	7	7	46	130	180	360	6.1
Mercury	2.9	2.6	3.6	64	740	410	0.5
Molybdenum	0.52	0.38	0.36	0.4	0.71	1.8	0.39
Nickel	6.3	3.7	28	23	24	12	8.5
Selenium	0.53	0.7	0.23	0.29	*0.77*	2	0.61
Silver	1.1	0.66	4.6	4.5	19	17	0.23
Zinc	33	25	140	59	99	100	38

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	0.531	-	-	0.93	2.4	2.7	6.2	-
Arsenic	13.3	50	36	-	-	16	17	-
Barium	281	-	-	-	-	-	400	-
Beryllium	0.118	-	-	0.12	0.14	0.19	0.14	-
Cadmium	0.172	0.18	0.22	1.2	0.29	0.93	1.4	0.24
Cobalt	7.19	-	-	-	7.2	-	-	-
Copper	13.0	-	-	19	30	78	85	-
Lead	11.5	-	-	46	130	180	360	-
Mercury	0.418	2.9	2.6	3.6	64	740	410	0.5
Molybdenum	0.650	-	-	-	-	0.71	1.8	-
Nickel	25.5	-	-	28	-	-	-	-
Selenium	1.08	-	-	-	-	-	2	-
Silver	0.534	1.1	0.66	4.6	4.5	19	17	-
Zinc	60.6	-	-	140	-	99	100	-

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	2.3E+02	-	-	4.1E-03	1.0E-02	1.2E-02	2.7E-02	-
Arsenic	3.5E+00	1.4E+01	1.0E+01	-	-	4.6E+00	4.9E+00	-
Barium	9.5E+04	-	-	-	-	-	4.2E-03	-
Beryllium	2.7E+01	-	-	4.5E-03	5.3E-03	7.1E-03	5.3E-03	-
Cadmium	3.9E+01	4.6E-03	5.6E-03	3.1E-02	7.4E-03	2.4E-02	3.6E-02	6.1E-03
Cobalt	2.0E+02	-	-	-	3.6E-02	-	-	-
Copper	2.7E+04	-	-	7.1E-04	1.1E-03	2.9E-03	3.2E-03	-
Lead	-	-	-	-	-	-	-	-
Mercury	1.5E+02	2.0E-02	1.8E-02	2.5E-02	4.4E-01	5.1E+00	2.8E+00	3.4E-03
Molybdenum	3.3E+03	-	-	-	-	2.1E-04	5.4E-04	-
Nickel	4.3E+03	-	-	6.6E-03	-	-	-	-
Selenium	3.3E+03	-	-	-	-	-	6.0E-04	-
Silver	3.3E+03	3.3E-04	2.0E-04	1.4E-03	1.4E-03	5.7E-03	5.1E-03	-
Zinc	2.0E+05	-	-	7.0E-04	-	5.0E-04	5.0E-04	-
	HI =>	**1.4E+01**	**1.0E+01**	**7.3E-02**	**5.0E-01**	**9.7E+00**	**7.8E+00**	**9.5E-03**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	-	-	-	-	-	-	-	-
Arsenic	9.2E+00	5E-05	4E-05	-	-	2E-05	2E-05	-
Barium	-	-	-	-	-	-	-	-
Beryllium	1.4E+05	-	-	9E-12	1E-11	1E-11	1E-11	-
Cadmium	6.9E+04	3E-11	3E-11	2E-10	4E-11	1E-10	2E-10	3E-11
Cobalt	3.7E+04	-	-	-	2E-09	-	-	-
Copper	-	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-
Nickel	1.3E+06	-	-	2E-10	-	-	-	-
Selenium	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-
	ILCR =>	**5E-05**	**4E-05**	**4E-10**	**2E-09**	**2E-05**	**2E-05**	**3E-11**

Risk Calculations for Recreational Cabin Occupant Receptor
~ SEDIMENT SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	0.34	0.24	0.93	2.4	2.7	6.2	0.3
Arsenic	50	36	8.7	8.9	16	17	5.7
Barium	81	38	280	210	270	400	86
Beryllium	*0.091*	0.032	0.12	0.14	0.19	0.14	0.061
Cadmium	0.18	0.22	1.2	0.29	0.93	1.4	0.24
Cobalt	2.8	2.2	7	7.2	6.9	4.7	3.0
Copper	5.2	5.1	19	30	78	85	7
Lead	7	7	46	130	180	360	6.1
Mercury	2.9	2.6	3.6	64	740	410	0.5
Molybdenum	0.52	0.38	0.36	0.4	0.71	1.8	0.39
Nickel	6.3	3.7	28	23	24	12	8.5
Selenium	0.53	0.7	0.23	0.29	*0.77*	2	0.61
Silver	1.1	0.66	4.6	4.5	19	17	0.23
Zinc	33	25	140	59	99	100	38

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	0.531	-	-	0.93	2.4	2.7	6.2	-
Arsenic	13.3	50	36	-	-	16	17	-
Barium	281	-	-	-	-	-	400	-
Beryllium	0.118	-	-	0.12	0.14	0.19	0.14	-
Cadmium	0.172	0.18	0.22	1.2	0.29	0.93	1.4	0.24
Cobalt	7.19	-	-	-	7.2	-	-	-
Copper	13.0	-	-	19	30	78	85	-
Lead	11.5	-	-	46	130	180	360	-
Mercury	0.418	2.9	2.6	3.6	64	740	410	0.5
Molybdenum	0.650	-	-	-	-	0.71	1.8	-
Nickel	25.5	-	-	28	-	-	-	-
Selenium	1.08	-	-	-	-	-	2	-
Silver	0.534	1.1	0.66	4.6	4.5	19	17	-
Zinc	60.6	-	-	140	-	99	100	-

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	1.9E+02	-	-	4.9E-03	1.3E-02	1.4E-02	3.2E-02	-
Arsenic	2.9E+00	1.7E+01	1.2E+01	-	-	5.5E+00	5.9E+00	-
Barium	7.9E+04	-	-	-	-	-	5.0E-03	-
Beryllium	2.2E+01	-	-	5.4E-03	6.3E-03	8.6E-03	6.3E-03	-
Cadmium	3.3E+01	5.5E-03	6.7E-03	3.7E-02	8.8E-03	2.8E-02	4.3E-02	7.3E-03
Cobalt	1.7E+02	-	-	-	4.3E-02	-	-	-
Copper	2.2E+04	-	-	8.6E-04	1.4E-03	3.5E-03	3.8E-03	-
Lead	-	-	-	-	-	-	-	-
Mercury	1.2E+02	2.4E-02	2.1E-02	3.0E-02	5.3E-01	6.1E+00	3.4E+00	4.1E-03
Molybdenum	2.8E+03	-	-	-	-	2.6E-04	6.5E-04	-
Nickel	3.5E+03	-	-	7.9E-03	-	-	-	-
Selenium	2.8E+03	-	-	-	-	-	7.2E-04	-
Silver	2.8E+03	4.0E-04	2.4E-04	1.7E-03	1.6E-03	6.9E-03	6.1E-03	-
Zinc	1.7E+05	-	-	8.4E-04	-	6.0E-04	6.0E-04	-
	HI =>	**1.7E+01**	**1.2E+01**	**8.8E-02**	**6.0E-01**	**1.2E+01**	**9.3E+00**	**1.1E-02**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	-	-	-	-	-	-	-	-
Arsenic	7.7E+00	7E-05	5E-05	-	-	2E-05	2E-05	-
Barium	-	-	-	-	-	-	-	-
Beryllium	1.2E+05	-	-	1E-11	1E-11	2E-11	1E-11	-
Cadmium	5.7E+04	3E-11	4E-11	2E-10	5E-11	2E-10	2E-10	4E-11
Cobalt	3.1E+04	-	-	-	2E-09	-	-	-
Copper	-	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-
Nickel	1.1E+06	-	-	3E-10	-	-	-	-
Selenium	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-
	ILCR =>	**7E-05**	**5E-05**	**5E-10**	**2E-09**	**2E-05**	**2E-05**	**4E-11**

Risk Calculations for Construction Worker Receptor
~ SEDIMENT SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	0.34	0.24	0.93	2.4	2.7	6.2	0.3
Arsenic	50	36	8.7	8.9	16	17	5.7
Barium	81	38	280	210	270	400	86
Beryllium	*0.091*	0.032	0.12	0.14	0.19	0.14	0.061
Cadmium	0.18	0.22	1.2	0.29	0.93	1.4	0.24
Cobalt	2.8	2.2	7	7.2	6.9	4.7	3.0
Copper	5.2	5.1	19	30	78	85	7
Lead	7	7	46	130	180	360	6.1
Mercury	2.9	2.6	3.6	64	740	410	0.5
Molybdenum	0.52	0.38	0.36	0.4	0.71	1.8	0.39
Nickel	6.3	3.7	28	23	24	12	8.5
Selenium	0.53	0.7	0.23	0.29	*0.77*	2	0.61
Silver	1.1	0.66	4.6	4.5	19	17	0.23
Zinc	33	25	140	59	99	100	38

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	0.531	-	-	0.93	2.4	2.7	6.2	-
Arsenic	13.3	50	36	-	-	16	17	-
Barium	281	-	-	-	-	-	400	-
Beryllium	0.118	-	-	0.12	0.14	0.19	0.14	-
Cadmium	0.172	0.18	0.22	1.2	0.29	0.93	1.4	0.24
Cobalt	7.19	-	-	-	7.2	-	-	-
Copper	13.0	-	-	19	30	78	85	-
Lead	11.5	-	-	46	130	180	360	-
Mercury	0.418	2.9	2.6	3.6	64	740	410	0.5
Molybdenum	0.650	-	-	-	-	0.71	1.8	-
Nickel	25.5	-	-	28	-	-	-	-
Selenium	1.08	-	-	-	-	-	2	-
Silver	0.534	1.1	0.66	4.6	4.5	19	17	-
Zinc	60.6	-	-	140	-	99	100	-

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	7.2E+01	-	-	1.3E-02	3.3E-02	3.8E-02	8.6E-02	-
Arsenic	1.2E+00	4.2E+01	3.0E+01	-	-	1.3E+01	1.4E+01	-
Barium	2.0E+03	-	-	-	-	-	2.0E-01	-
Beryllium	2.9E+00	-	-	4.1E-02	4.8E-02	6.5E-02	4.8E-02	-
Cadmium	1.4E+00	1.3E-01	1.6E-01	8.8E-01	2.1E-01	6.8E-01	1.0E+00	1.8E-01
Cobalt	2.0E+01	-	-	-	3.5E-01	-	-	-
Copper	1.2E+04	-	-	1.5E-03	2.4E-03	6.3E-03	6.9E-03	-
Lead	-	-	-	-	-	-	-	-
Mercury	3.3E+01	8.7E-02	7.8E-02	1.1E-01	1.9E+00	2.2E+01	1.2E+01	1.5E-02
Molybdenum	1.5E+03	-	-	-	-	4.6E-04	1.2E-03	-
Nickel	5.7E+01	-	-	4.9E-01	-	-	-	-
Selenium	1.5E+03	-	-	-	-	-	1.3E-03	-
Silver	1.5E+03	7.1E-04	4.3E-04	3.0E-03	2.9E-03	1.2E-02	1.1E-02	-
Zinc	9.3E+04	-	-	1.5E-03	-	1.1E-03	1.1E-03	-
	HI =>	**4.2E+01**	**3.0E+01**	**1.5E+00**	**2.6E+00**	**3.6E+01**	**2.8E+01**	**1.9E-01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	-	-	-	-	-	-	-	-
Arsenic	2.4E+01	2E-05	1E-05	-	-	7E-06	7E-06	-
Barium	-	-	-	-	-	-	-	-
Beryllium	1.3E+03	-	-	9E-10	1E-09	1E-09	1E-09	-
Cadmium	7.3E+02	2E-09	3E-09	2E-08	4E-09	1E-08	2E-08	3E-09
Cobalt	3.4E+02	-	-	-	2E-07	-	-	-
Copper	-	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-
Nickel	1.2E+04	-	-	2E-08	-	-	-	-
Selenium	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-
	ILCR =>	**2E-05**	**1E-05**	**4E-08**	**2E-07**	**7E-06**	**7E-06**	**3E-09**

Risk Calculations for Residential Receptor

~ SEDIMENT SAMPLES (sample-specific risk values) ~

CONCENTRATIONS (mg/kg)

COPC	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	0.34	0.24	0.93	2.4	2.7	6.2	0.3
Arsenic	50	36	8.7	8.9	16	17	5.7
Barium	81	38	280	210	270	400	86
Beryllium	*0.091*	0.032	0.12	0.14	0.19	0.14	0.061
Cadmium	0.18	0.22	1.2	0.29	0.93	1.4	0.24
Cobalt	2.8	2.2	7	7.2	6.9	4.7	3.0
Copper	5.2	5.1	19	30	78	85	7
Lead	7	7	46	130	180	360	6.1
Mercury	2.9	2.6	3.6	64	740	410	0.5
Molybdenum	0.52	0.38	0.36	0.4	0.71	1.8	0.39
Nickel	6.3	3.7	28	23	24	12	8.5
Selenium	0.53	0.7	0.23	0.29	*0.77*	2	0.61
Silver	1.1	0.66	4.6	4.5	19	17	0.23
Zinc	33	25	140	59	99	100	38

Italicized values are reporting limits for non-detect' results.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	0.531	-	-	0.93	2.4	2.7	6.2	-
Arsenic	13.3	50	36	-	-	16	17	-
Barium	281	-	-	-	-	-	400	-
Beryllium	0.118	-	-	0.12	0.14	0.19	0.14	-
Cadmium	0.172	0.18	0.22	1.2	0.29	0.93	1.4	0.24
Cobalt	7.19	-	-	-	7.2	-	-	-
Copper	13.0	-	-	19	30	78	85	-
Lead	11.5	-	-	46	130	180	360	-
Mercury	0.418	2.9	2.6	3.6	64	740	410	0.5
Molybdenum	0.650	-	-	-	-	0.71	1.8	-
Nickel	25.5	-	-	28	-	-	-	-
Selenium	1.08	-	-	-	-	-	2	-
Silver	0.534	1.1	0.66	4.6	4.5	19	17	-
Zinc	60.6	-	-	140	-	99	100	-

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	3.1E+01	-	-	3.0E-02	7.7E-02	8.7E-02	2.0E-01	-
Arsenic	4.0E-01	1.3E+02	9.0E+01	-	-	4.0E+01	4.3E+01	-
Barium	1.5E+04	-	-	-	-	-	2.7E-02	-
Beryllium	3.0E+00	-	-	4.0E-02	4.7E-02	6.3E-02	4.7E-02	-
Cadmium	4.5E+00	4.0E-02	4.9E-02	2.7E-01	6.4E-02	2.1E-01	3.1E-01	5.3E-02
Cobalt	2.3E+01	-	-	-	3.1E-01	-	-	-
Copper	3.1E+03	-	-	6.1E-03	9.7E-03	2.5E-02	2.7E-02	-
Lead	-	-	-	-	-	-	-	-
Mercury	2.3E+01	1.3E-01	1.1E-01	1.6E-01	2.8E+00	3.2E+01	1.8E+01	2.2E-02
Molybdenum	3.9E+02	-	-	-	-	1.8E-03	4.6E-03	-
Nickel	4.9E+02	-	-	5.8E-02	-	-	-	-
Selenium	3.9E+02	-	-	-	-	-	5.1E-03	-
Silver	3.9E+02	2.8E-03	1.7E-03	1.2E-02	1.2E-02	4.9E-02	4.4E-02	-
Zinc	2.3E+04	-	-	6.1E-03	-	4.3E-03	4.3E-03	-
	HI =>	**1.3E+02**	**9.0E+01**	**5.7E-01**	**3.3E+00**	**7.3E+01**	**6.1E+01**	**7.5E-02**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	MM-SD-02 (PPE)	MM-SD-03 (Dwnstrm)	MM-SD-04	MM-SD-05	MM-SD-06	MM-SD-07	MM-SD-08
Antimony	-	-	-	-	-	-	-	-
Arsenic	1.1E+00	5E-04	3E-04	-	-	2E-04	2E-04	-
Barium	-	-	-	-	-	-	-	-
Beryllium	1.6E+04	-	-	8E-11	9E-11	1E-10	9E-11	-
Cadmium	7.9E+03	2E-10	3E-10	2E-09	4E-10	1E-09	2E-09	3E-10
Cobalt	4.2E+03	-	-	-	2E-08	-	-	-
Copper	-	-	-	-	-	-	-	-
Lead	-	-	-	-	-	-	-	-
Mercury	-	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-	-
Nickel	1.5E+05	-	-	2E-09	-	-	-	-
Selenium	-	-	-	-	-	-	-	-
Silver	-	-	-	-	-	-	-	-
Zinc	-	-	-	-	-	-	-	-
	ILCR =>	**5E-04**	**3E-04**	**4E-09**	**2E-08**	**2E-04**	**2E-04**	**3E-10**

ATTACHMENT H

Summary Statistics and 95th UCL for Sitewide Soil Samples

~ all values are in units of mg/kg ~

Sample	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Zinc
MM-S-01	230	19	210	0.12	0.62	17	190	2500	52	0.83	34	0.8	5.4	570
MM-S-02	4.2	12	230	0.27	0.15	5.4	21	150	210	0.37	16	0.17	3.8	42
MM-S-03	25	84	1000	0.17	2.4	3.7	130	430	260	5.3	11	6.6	85	150
MM-S-04	19	36	950	0.21	1.4	4.9	100	380	2200	2.6	17	2.7	64	110
MM-S-05	0.71	9.7	150	0.24	0.18	5.6	12	18	2.4	0.34	19	0.11	2.6	48
MM-S-06	23	28	750	0.17	0.97	4.9	58	600	51	0.87	15	1.2	9.3	160
MM-S-07	1	11	220	0.2	0.31	6	95	39	58	0.46	21	0.34	2.2	55
MM-S-08	4	15	240	0.12	0.99	5.7	69	220	31	1.5	16	0.61	8	120
MM-S-09	35	210	1300	0.12	1.5	1.1	240	750	27	21	2.3	14	140	370
MM-S-10	5.1	12	250	0.2	1	6.1	59	180	150	0.55	21	0.57	6.8	100
MM-S-11	0.28	4.4	160	0.16	0.25	4.2	8.3	9.9	0.98	0.45	9	0.14	0.58	43
MM-S-12	0.55	9.1	140	0.19	0.48	4.5	17	17	18	0.69	13	0.38	2.7	63
MM-S-13	0.19	4	100	0.12	0.35	4.5	9.1	44	3.9	0.55	8.7	0.17	0.43	63
MM-S-14	1	26	120	0.069	0.39	3.8	12	32	23	0.42	8.5	0.44	7.7	46
MM-S-15	0.072	3.3	49	0.11	0.071	4.3	5.2	2.7	0.54	0.3	16	0.13	0.064	24
MM-S-16	0.059	6.1	88	0.17	0.11	4.3	6.7	8.8	0.75	0.45	12	0.11	0.31	29
MM-S-17	0.064	7.4	110	0.025	0.083	5.8	8.5	5.6	0.55	0.28	16	0.12	0.098	29
MM-S-18	1.3	30	260	0.03	0.34	7.4	21	91	1.8	0.47	28	0.28	2.3	75
MM-S-19	1	11	290	0.03	0.28	8.6	18	51	4	0.53	30	0.17	3.1	77
MM-S-20	0.47	9.6	97	0.031	0.11	4.3	11	170	9.3	0.58	9.1	0.25	2.7	36
MM-S-21	0.075	6.4	87	0.03	0.086	3.7	6	8.3	0.77	0.52	8.4	0.14	0.13	31
MM-S-22	0.07	4.6	74	0.036	0.14	4.2	11	17	0.58	0.78	9.4	0.13	0.19	20
MM-S-23	0.073	6.4	84	0.029	0.2	3.2	11	9.6	8.7	0.55	9.4	0.16	0.89	39
MM-S-24	5.8	30	720	0.029	1.3	4.1	42	93	120	1.9	9.5	2.2	15	130
MM-S-25	0.066	4.4	76	0.026	0.12	4.8	6.2	10	3.2	0.37	15	0.14	0.21	34
MM-S-26	0.07	4.5	97	0.028	0.16	4.4	9.2	17	14	0.49	15	0.17	0.053	34
MM-S-27	0.057	5.9	87	0.022	0.13	6.1	9.4	7.1	0.61	0.33	21	0.1	0.12	37
MM-S-28	5.6	25	450	0.039	0.69	5.2	36	97	42	2	13	1.5	12	74
MM-S-29	0.31	4.6	99	0.18	0.17	4.8	8.3	11	2.1	0.52	14	0.14	0.36	33
MM-S-30	5.4	39	520	0.027	1.1	3.9	45	110	120	1.8	12	2.4	19	110
MM-S-31	0.071	3.1	73	0.028	0.085	4.6	5.1	4.1	0.88	0.39	13	0.13	0.21	37
MM-S-32	4.2	10	390	0.022	0.39	3.9	21	50	140	0.73	14	0.59	6.3	64
MM-S-33	1.3	8.4	200	0.28	0.27	5	15	49	14	1.8	12	0.21	3	63
MM-S-34	0.67	6.8	94	0.33	0.12	6.9	8.8	8.7	4	0.79	19	0.098	0.68	40
MM-S-35	6.6	24	630	0.19	0.78	3.9	33	98	72	2.1	13	1.3	9.8	79
MM-S-36	0.57	4.3	85	0.15	0.15	3.7	8.5	12	0.62	0.45	10	0.12	0.3	40
MM-S-37	0.98	6.4	91	0.13	0.15	4.1	17	240	2	0.42	7.8	0.15	1.5	63
Minimum =>	**0.057**	**3.1**	**49**	**0.022**	**0.071**	**1.1**	**5.1**	**2.7**	**0.54**	**0.28**	**2.3**	**0.098**	**0.053**	**20**
95th UCL =>	**49.4**	**45.5**	**504**	**0.180**	**0.862**	**5.80**	**75.1**	**484**	**469**	**3.93**	**16.6**	**2.84**	**39.6**	**158**
Maximum =>	**230**	**210**	**1300**	**0.33**	**2.4**	**17**	**240**	**2500**	**2200**	**21**	**34**	**14**	**140**	**570**

Risk Calculations for Recreational User Receptor
~ SOIL SAMPLES (Sitewide 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	49.4
Arsenic	45.5
Barium	504
Beryllium	0.180
Cadmium	0.862
Cobalt	5.80
Copper	75.1
Lead	484
Mercury	469
Molybdenum	3.93
Nickel	16.6
Selenium	2.84
Silver	39.6
Zinc	158

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	49.4
Arsenic	13.3	45.5
Barium	281	504
Beryllium	0.118	0.180
Cadmium	0.172	0.862
Cobalt	7.19	-
Copper	13.0	75.1
Lead	11.5	484
Mercury	0.418	469
Molybdenum	0.650	3.93
Nickel	25.5	-
Selenium	1.08	2.84
Silver	0.534	39.6
Zinc	60.6	158

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	2.3E+02	2.2E-01
Arsenic	3.5E+00	1.3E+01
Barium	9.5E+04	5.3E-03
Beryllium	2.7E+01	6.8E-03
Cadmium	3.9E+01	2.2E-02
Cobalt	2.0E+02	-
Copper	2.7E+04	2.8E-03
Lead	-	-
Mercury	1.5E+02	3.2E+00
Molybdenum	3.3E+03	1.2E-03
Nickel	4.3E+03	-
Selenium	3.3E+03	8.5E-04
Silver	3.3E+03	1.2E-02
Zinc	2.0E+05	7.9E-04
	HI =>	**1.7E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	9.2E+00	5E-05
Barium	-	-
Beryllium	1.4E+05	1E-11
Cadmium	6.9E+04	1E-10
Cobalt	3.7E+04	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.3E+06	-
Selenium	-	-
Silver	-	-
Zinc	-	-
	ILCR =>	**5E-05**

Risk Calculations for Recreational Cabin Occupant Receptor
~ SOIL SAMPLES (Sitewide 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	49.4
Arsenic	45.5
Barium	504
Beryllium	0.180
Cadmium	0.862
Cobalt	5.80
Copper	75.1
Lead	484
Mercury	469
Molybdenum	3.93
Nickel	16.6
Selenium	2.84
Silver	39.6
Zinc	158

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	49.4
Arsenic	13.3	45.5
Barium	281	504
Beryllium	0.118	0.180
Cadmium	0.172	0.862
Cobalt	7.19	-
Copper	13.0	75.1
Lead	11.5	484
Mercury	0.418	469
Molybdenum	0.650	3.93
Nickel	25.5	-
Selenium	1.08	2.84
Silver	0.534	39.6
Zinc	60.6	158

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	1.9E+02	2.6E-01
Arsenic	2.9E+00	1.6E+01
Barium	7.9E+04	6.3E-03
Beryllium	2.2E+01	8.1E-03
Cadmium	3.3E+01	2.6E-02
Cobalt	1.7E+02	-
Copper	2.2E+04	3.4E-03
Lead	-	-
Mercury	1.2E+02	3.9E+00
Molybdenum	2.8E+03	1.4E-03
Nickel	3.5E+03	-
Selenium	2.8E+03	1.0E-03
Silver	2.8E+03	1.4E-02
Zinc	1.7E+05	9.5E-04
	HI =>	**2.0E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	7.7E+00	6E-05
Barium	-	-
Beryllium	1.2E+05	2E-11
Cadmium	5.7E+04	2E-10
Cobalt	3.1E+04	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.1E+06	-
Selenium	-	-
Silver	-	-
Zinc	-	-
	ILCR =>	**6E-05**

Risk Calculations for Construction Worker Receptor
~ SOIL SAMPLES (Sitewide 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	49.4
Arsenic	45.5
Barium	504
Beryllium	0.180
Cadmium	0.862
Cobalt	5.80
Copper	75.1
Lead	484
Mercury	469
Molybdenum	3.93
Nickel	16.6
Selenium	2.84
Silver	39.6
Zinc	158

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	49.4
Arsenic	13.3	45.5
Barium	281	504
Beryllium	0.118	0.180
Cadmium	0.172	0.862
Cobalt	7.19	-
Copper	13.0	75.1
Lead	11.5	484
Mercury	0.418	469
Molybdenum	0.650	3.93
Nickel	25.5	-
Selenium	1.08	2.84
Silver	0.534	39.6
Zinc	60.6	158

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	7.2E+01	6.9E-01
Arsenic	1.2E+00	3.8E+01
Barium	2.0E+03	2.5E-01
Beryllium	2.9E+00	6.2E-02
Cadmium	1.4E+00	6.3E-01
Cobalt	2.0E+01	-
Copper	1.2E+04	6.1E-03
Lead	-	-
Mercury	3.3E+01	1.4E+01
Molybdenum	1.5E+03	2.5E-03
Nickel	5.7E+01	-
Selenium	1.5E+03	1.9E-03
Silver	1.5E+03	2.6E-02
Zinc	9.3E+04	1.7E-03
	HI =>	**5.4E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	2.4E+01	2E-05
Barium	-	-
Beryllium	1.3E+03	1E-09
Cadmium	7.3E+02	1E-08
Cobalt	3.4E+02	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.2E+04	-
Selenium	-	-
Silver	-	-
Zinc	-	-
	ILCR =>	**2E-05**

Risk Calculations for Residential Receptor

~ SOIL SAMPLES (Sitewide 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	49.4
Arsenic	45.5
Barium	504
Beryllium	0.180
Cadmium	0.862
Cobalt	5.80
Copper	75.1
Lead	484
Mercury	469
Molybdenum	3.93
Nickel	16.6
Selenium	2.84
Silver	39.6
Zinc	158

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	49.4
Arsenic	13.3	45.5
Barium	281	504
Beryllium	0.118	0.180
Cadmium	0.172	0.862
Cobalt	7.19	-
Copper	13.0	75.1
Lead	11.5	484
Mercury	0.418	469
Molybdenum	0.650	3.93
Nickel	25.5	-
Selenium	1.08	2.84
Silver	0.534	39.6
Zinc	60.6	158

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	3.1E+01	1.6E+00
Arsenic	4.0E-01	1.1E+02
Barium	1.5E+04	3.4E-02
Beryllium	3.0E+00	6.0E-02
Cadmium	4.5E+00	1.9E-01
Cobalt	2.3E+01	-
Copper	3.1E+03	2.4E-02
Lead	-	-
Mercury	2.3E+01	2.0E+01
Molybdenum	3.9E+02	1.0E-02
Nickel	4.9E+02	-
Selenium	3.9E+02	7.3E-03
Silver	3.9E+02	1.0E-01
Zinc	2.3E+04	6.9E-03
	HI =>	**1.4E+02**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	1.1E+00	4E-04
Barium	-	-
Beryllium	1.6E+04	1E-10
Cadmium	7.9E+03	1E-09
Cobalt	4.2E+03	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.5E+05	-
Selenium	-	-
Silver	-	-
Zinc	-	-
	ILCR =>	**4E-04**

Summary Statistics and 95th UCL for Mill Area Soil Samples

~ all values are in units of mg/kg ~

Sample	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Zinc
MM-S-01	230	19	210	0.12	0.62	17	190	2500	52	0.83	34	0.8	5.4	570
MM-S-02	4.2	12	230	0.27	0.15	5.4	21	150	210	0.37	16	0.17	3.8	42
MM-S-03	25	84	1000	0.17	2.4	3.7	130	430	260	5.3	11	6.6	85	150
MM-S-04	19	36	950	0.21	1.4	4.9	100	380	2200	2.6	17	2.7	64	110
MM-S-05	0.71	9.7	150	0.24	0.18	5.6	12	18	2.4	0.34	19	0.11	2.6	48
MM-S-06	23	28	750	0.17	0.97	4.9	58	600	51	0.87	15	1.2	9.3	160
MM-S-07	1	11	220	0.2	0.31	6	95	39	58	0.46	21	0.34	2.2	55
MM-S-08	4	15	240	0.12	0.99	5.7	69	220	31	1.5	16	0.61	8	120
MM-S-09	35	210	1300	0.12	1.5	1.1	240	750	27	21	2.3	14	140	370
MM-S-10	5.1	12	250	0.2	1	6.1	59	180	150	0.55	21	0.57	6.8	100
MM-S-16	0.059	6.1	88	0.17	0.11	4.3	6.7	8.8	0.75	0.45	12	0.11	0.31	29
MM-S-17	0.064	7.4	110	0.025	0.083	5.8	8.5	5.6	0.55	0.28	16	0.12	0.098	29
MM-S-18	1.3	30	260	0.03	0.34	7.4	21	91	1.8	0.47	28	0.28	2.3	75
MM-S-19	1	11	290	0.03	0.28	8.6	18	51	4	0.53	30	0.17	3.1	77
MM-S-20	0.47	9.6	97	0.031	0.11	4.3	11	170	9.3	0.58	9.1	0.25	2.7	36
MM-S-23	0.073	6.4	84	0.029	0.2	3.2	11	9.6	8.7	0.55	9.4	0.16	0.89	39
MM-S-24	5.8	30	720	0.029	1.3	4.1	42	93	120	1.9	9.5	2.2	15	130
MM-S-25	0.066	4.4	76	0.026	0.12	4.8	6.2	10	3.2	0.37	15	0.14	0.21	34
MM-S-26	0.07	4.5	97	0.028	0.16	4.4	9.2	17	14	0.49	15	0.17	0.053	34
MM-S-27	0.057	5.9	87	0.022	0.13	6.1	9.4	7.1	0.61	0.33	21	0.1	0.12	37
MM-S-29	0.31	4.6	99	0.18	0.17	4.8	8.3	11	2.1	0.52	14	0.14	0.36	33
Minimum =>	**0.057**	**4.4**	**76**	**0.022**	**0.083**	**1.1**	**6.2**	**5.6**	**0.55**	**0.28**	**2.3**	**0.1**	**0.053**	**29**
95th UCL =>	**43.3**	**70.0**	**694**	**0.196**	**1.20**	**6.83**	**116**	**551**	**372**	**6.22**	**19.5**	**4.55**	**65.5**	**161**
Maximum =>	**230**	**210**	**1300**	**0.27**	**2.4**	**17**	**240**	**2500**	**2200**	**21**	**34**	**14**	**140**	**570**

Risk Calculations for Recreational User Receptor
~ SOIL SAMPLES (Mill Area 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	43.3
Arsenic	70.0
Barium	694
Beryllium	0.196
Cadmium	1.20
Cobalt	6.83
Copper	116
Lead	551
Mercury	372
Molybdenum	6.22
Nickel	19.5
Selenium	4.55
Silver	65.5
Zinc	161

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	43.3
Arsenic	13.3	70.0
Barium	281	694
Beryllium	0.118	0.196
Cadmium	0.172	1.20
Cobalt	7.19	-
Copper	13.0	116
Lead	11.5	551
Mercury	0.418	372
Molybdenum	0.650	6.22
Nickel	25.5	-
Selenium	1.08	4.55
Silver	0.534	65.5
Zinc	60.6	161

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	2.3E+02	1.9E-01
Arsenic	3.5E+00	2.0E+01
Barium	9.5E+04	7.3E-03
Beryllium	2.7E+01	7.4E-03
Cadmium	3.9E+01	3.0E-02
Cobalt	2.0E+02	-
Copper	2.7E+04	4.3E-03
Lead	-	-
Mercury	1.5E+02	2.6E+00
Molybdenum	3.3E+03	1.9E-03
Nickel	4.3E+03	-
Selenium	3.3E+03	1.4E-03
Silver	3.3E+03	2.0E-02
Zinc	2.0E+05	8.0E-04
	HI =>	**2.3E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	9.2E+00	8E-05
Barium	-	-
Beryllium	1.4E+05	1E-11
Cadmium	6.9E+04	2E-10
Cobalt	3.7E+04	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.3E+06	-
Selenium	-	-
Silver	-	-
Zinc	-	-
	ILCR =>	**8E-05**

Risk Calculations for Recreational Cabin Occupant Receptor
~ SOIL SAMPLES (Mill Area 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	43.3
Arsenic	70.0
Barium	694
Beryllium	0.196
Cadmium	1.20
Cobalt	6.83
Copper	116
Lead	551
Mercury	372
Molybdenum	6.22
Nickel	19.5
Selenium	4.55
Silver	65.5
Zinc	161

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	43.3
Arsenic	13.3	70.0
Barium	281	694
Beryllium	0.118	0.196
Cadmium	0.172	1.20
Cobalt	7.19	-
Copper	13.0	116
Lead	11.5	551
Mercury	0.418	372
Molybdenum	0.650	6.22
Nickel	25.5	-
Selenium	1.08	4.55
Silver	0.534	65.5
Zinc	60.6	161

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	1.9E+02	2.3E-01
Arsenic	2.9E+00	2.4E+01
Barium	7.9E+04	8.7E-03
Beryllium	2.2E+01	8.8E-03
Cadmium	3.3E+01	3.7E-02
Cobalt	1.7E+02	-
Copper	2.2E+04	5.2E-03
Lead	-	-
Mercury	1.2E+02	3.1E+00
Molybdenum	2.8E+03	2.2E-03
Nickel	3.5E+03	-
Selenium	2.8E+03	1.6E-03
Silver	2.8E+03	2.4E-02
Zinc	1.7E+05	9.7E-04
	HI =>	**2.7E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	7.7E+00	9E-05
Barium	-	-
Beryllium	1.2E+05	2E-11
Cadmium	5.7E+04	2E-10
Cobalt	3.1E+04	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.1E+06	-
Selenium	-	-
Silver	-	-
Zinc	-	-
	ILCR =>	**9E-05**

Risk Calculations for Construction Worker Receptor
~ SOIL SAMPLES (Mill Area 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	43.3
Arsenic	70.0
Barium	694
Beryllium	0.196
Cadmium	1.20
Cobalt	6.83
Copper	116
Lead	551
Mercury	372
Molybdenum	6.22
Nickel	19.5
Selenium	4.55
Silver	65.5
Zinc	161

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	43.3
Arsenic	13.3	70.0
Barium	281	694
Beryllium	0.118	0.196
Cadmium	0.172	1.20
Cobalt	7.19	-
Copper	13.0	116
Lead	11.5	551
Mercury	0.418	372
Molybdenum	0.650	6.22
Nickel	25.5	-
Selenium	1.08	4.55
Silver	0.534	65.5
Zinc	60.6	161

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	7.2E+01	6.0E-01
Arsenic	1.2E+00	5.9E+01
Barium	2.0E+03	3.5E-01
Beryllium	2.9E+00	6.7E-02
Cadmium	1.4E+00	8.8E-01
Cobalt	2.0E+01	-
Copper	1.2E+04	9.4E-03
Lead	-	-
Mercury	3.3E+01	1.1E+01
Molybdenum	1.5E+03	4.0E-03
Nickel	5.7E+01	-
Selenium	1.5E+03	3.0E-03
Silver	1.5E+03	4.2E-02
Zinc	9.3E+04	1.7E-03
		HI => **7.2E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	2.4E+01	3E-05
Barium	-	-
Beryllium	1.3E+03	2E-09
Cadmium	7.3E+02	2E-08
Cobalt	3.4E+02	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.2E+04	-
Selenium	-	-
Silver	-	-
Zinc	-	-
		ILCR => **3E-05**

Risk Calculations for Residential Receptor

~ SOIL SAMPLES (Mill Area 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	43.3
Arsenic	70.0
Barium	694
Beryllium	0.196
Cadmium	1.20
Cobalt	6.83
Copper	116
Lead	551
Mercury	372
Molybdenum	6.22
Nickel	19.5
Selenium	4.55
Silver	65.5
Zinc	161

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	43.3
Arsenic	13.3	70.0
Barium	281	694
Beryllium	0.118	0.196
Cadmium	0.172	1.20
Cobalt	7.19	-
Copper	13.0	116
Lead	11.5	551
Mercury	0.418	372
Molybdenum	0.650	6.22
Nickel	25.5	-
Selenium	1.08	4.55
Silver	0.534	65.5
Zinc	60.6	161

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	3.1E+01	1.4E+00
Arsenic	4.0E-01	1.8E+02
Barium	1.5E+04	4.6E-02
Beryllium	3.0E+00	6.5E-02
Cadmium	4.5E+00	2.7E-01
Cobalt	2.3E+01	-
Copper	3.1E+03	3.7E-02
Lead	-	-
Mercury	2.3E+01	1.6E+01
Molybdenum	3.9E+02	1.6E-02
Nickel	4.9E+02	-
Selenium	3.9E+02	1.2E-02
Silver	3.9E+02	1.7E-01
Zinc	2.3E+04	7.0E-03
	HI =>	**1.9E+02**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	1.1E+00	7E-04
Barium	-	-
Beryllium	1.6E+04	1E-10
Cadmium	7.9E+03	2E-09
Cobalt	4.2E+03	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.5E+05	-
Selenium	-	-
Silver	-	-
Zinc	-	-
	ILCR =>	**7E-04**

Summary Statistics and 95th UCL
for Cabin Area Soil Samples
~ all values are in units of mg/kg ~

Sample	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Zinc
MM-S-11	0.28	4.4	160	0.16	0.25	4.2	8.3	9.9	0.98	0.45	9	0.14	0.58	43
MM-S-12	0.55	9.1	140	0.19	0.48	4.5	17	17	18	0.69	13	0.38	2.7	63
MM-S-13	0.19	4	100	0.12	0.35	4.5	9.1	44	3.9	0.55	8.7	0.17	0.43	63
MM-S-14	1	26	120	0.069	0.39	3.8	12	32	23	0.42	8.5	0.44	7.7	46
MM-S-15	0.072	3.3	49	0.11	0.071	4.3	5.2	2.7	0.54	0.3	16	0.13	0.064	24
MM-S-21	0.075	6.4	87	0.03	0.086	3.7	6	8.3	0.77	0.52	8.4	0.14	0.13	31
MM-S-22	0.07	4.6	74	0.036	0.14	4.2	11	17	0.58	0.78	9.4	0.13	0.19	20
MM-S-24	5.8	30	720	0.029	1.3	4.1	42	93	120	1.9	9.5	2.2	15	130
MM-S-28	5.6	25	450	0.039	0.69	5.2	36	97	42	2	13	1.5	12	74
MM-S-29	0.31	4.6	99	0.18	0.17	4.8	8.3	11	2.1	0.52	14	0.14	0.36	33
MM-S-30	5.4	39	520	0.027	1.1	3.9	45	110	120	1.8	12	2.4	19	110
MM-S-31	0.071	3.1	73	0.028	0.085	4.6	5.1	4.1	0.88	0.39	13	0.13	0.21	37
MM-S-32	4.2	10	390	0.022	0.39	3.9	21	50	140	0.73	14	0.59	6.3	64
MM-S-33	1.3	8.4	200	0.28	0.27	5	15	49	14	1.8	12	0.21	3	63
MM-S-34	0.67	6.8	94	0.33	0.12	6.9	8.8	8.7	4	0.79	19	0.098	0.68	40
MM-S-35	6.6	24	630	0.19	0.78	3.9	33	98	72	2.1	13	1.3	9.8	79
MM-S-36	0.57	4.3	85	0.15	0.15	3.7	8.5	12	0.62	0.45	10	0.12	0.3	40
MM-S-37	0.98	6.4	91	0.13	0.15	4.1	17	240	2	0.42	7.8	0.15	1.5	63
Minimum =>	**0.07**	**3.1**	**49**	**0.022**	**0.071**	**3.7**	**5.1**	**2.7**	**0.54**	**0.3**	**7.8**	**0.098**	**0.064**	**20**
95th UCL =>	**3.74**	**23.7**	**447**	**0.156**	**0.590**	**4.72**	**24.0**	**87.7**	**143**	**1.59**	**12.9**	**1.34**	**9.4**	**68.7**
Maximum =>	**6.6**	**39**	**720**	**0.33**	**1.3**	**6.9**	**45**	**240**	**140**	**2.1**	**19**	**2.4**	**19**	**130**

95th UCL exceeds maximum value.

Risk Calculations for Recreational User Receptor
~ SOIL SAMPLES (Cabin Area 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	3.74
Arsenic	23.7
Barium	447
Beryllium	0.156
Cadmium	0.590
Cobalt	4.72
Copper	24.0
Lead	87.7
Mercury	143
Molybdenum	1.59
Nickel	12.9
Selenium	1.34
Silver	9.36
Zinc	68.7

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	3.7
Arsenic	13.3	23.7
Barium	281	447
Beryllium	0.118	0.156
Cadmium	0.172	0.59
Cobalt	7.19	-
Copper	13.0	24
Lead	11.5	88
Mercury	0.418	143
Molybdenum	0.650	1.59
Nickel	25.5	-
Selenium	1.08	1.34
Silver	0.534	9.4
Zinc	60.6	69

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	2.3E+02	1.6E-02
Arsenic	3.5E+00	6.8E+00
Barium	9.5E+04	4.7E-03
Beryllium	2.7E+01	5.9E-03
Cadmium	3.9E+01	1.5E-02
Cobalt	2.0E+02	-
Copper	2.7E+04	9.0E-04
Lead	-	-
Mercury	1.5E+02	9.9E-01
Molybdenum	3.3E+03	4.8E-04
Nickel	4.3E+03	-
Selenium	3.3E+03	4.0E-04
Silver	3.3E+03	2.8E-03
Zinc	2.0E+05	3.4E-04
		HI => **7.8E+00**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	9.2E+00	3E-05
Barium	-	-
Beryllium	1.4E+05	1E-11
Cadmium	6.9E+04	9E-11
Cobalt	3.7E+04	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.3E+06	-
Selenium	-	-
Silver	-	-
Zinc	-	-
		ILCR => **3E-05**

Risk Calculations for Recreational Cabin Occupant Receptor
~ SOIL SAMPLES (Cabin Area 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	3.74
Arsenic	23.7
Barium	447
Beryllium	0.156
Cadmium	0.590
Cobalt	4.72
Copper	24.0
Lead	87.7
Mercury	143
Molybdenum	1.59
Nickel	12.9
Selenium	1.34
Silver	9.36
Zinc	68.7

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	3.7
Arsenic	13.3	23.7
Barium	281	447
Beryllium	0.118	0.156
Cadmium	0.172	0.59
Cobalt	7.19	-
Copper	13.0	24
Lead	11.5	88
Mercury	0.418	143
Molybdenum	0.650	1.59
Nickel	25.5	-
Selenium	1.08	1.34
Silver	0.534	9.4
Zinc	60.6	69

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	1.9E+02	2.0E-02
Arsenic	2.9E+00	8.1E+00
Barium	7.9E+04	5.6E-03
Beryllium	2.2E+01	7.0E-03
Cadmium	3.3E+01	1.8E-02
Cobalt	1.7E+02	-
Copper	2.2E+04	1.1E-03
Lead	-	-
Mercury	1.2E+02	1.2E+00
Molybdenum	2.8E+03	5.8E-04
Nickel	3.5E+03	-
Selenium	2.8E+03	4.8E-04
Silver	2.8E+03	3.4E-03
Zinc	1.7E+05	4.1E-04
	HI =>	**9.4E+00**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	7.7E+00	3E-05
Barium	-	-
Beryllium	1.2E+05	1E-11
Cadmium	5.7E+04	1E-10
Cobalt	3.1E+04	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.1E+06	-
Selenium	-	-
Silver	-	-
Zinc	-	-
	ILCR =>	**3E-05**

Risk Calculations for Construction Worker Receptor
~ SOIL SAMPLES (Cabin Area 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	3.74
Arsenic	23.7
Barium	447
Beryllium	0.156
Cadmium	0.590
Cobalt	4.72
Copper	24.0
Lead	87.7
Mercury	143
Molybdenum	1.59
Nickel	12.9
Selenium	1.34
Silver	9.36
Zinc	68.7

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	3.7
Arsenic	13.3	23.7
Barium	281	447
Beryllium	0.118	0.156
Cadmium	0.172	0.59
Cobalt	7.19	-
Copper	13.0	24
Lead	11.5	88
Mercury	0.418	143
Molybdenum	0.650	1.59
Nickel	25.5	-
Selenium	1.08	1.34
Silver	0.534	9.4
Zinc	60.6	69

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	7.2E+01	5.2E-02
Arsenic	1.2E+00	2.0E+01
Barium	2.0E+03	2.2E-01
Beryllium	2.9E+00	5.3E-02
Cadmium	1.4E+00	4.3E-01
Cobalt	2.0E+01	-
Copper	1.2E+04	1.9E-03
Lead	-	-
Mercury	3.3E+01	4.3E+00
Molybdenum	1.5E+03	1.0E-03
Nickel	5.7E+01	-
Selenium	1.5E+03	8.9E-04
Silver	1.5E+03	6.1E-03
Zinc	9.3E+04	7.4E-04
	HI =>	**2.5E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	2.4E+01	1E-05
Barium	-	-
Beryllium	1.3E+03	1E-09
Cadmium	7.3E+02	8E-09
Cobalt	3.4E+02	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.2E+04	-
Selenium	-	-
Silver	-	-
Zinc	-	-
	ILCR =>	**1E-05**

Risk Calculations for Residential Receptor

~ SOIL SAMPLES (Cabin Area 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	3.74
Arsenic	23.7
Barium	447
Beryllium	0.156
Cadmium	0.590
Cobalt	4.72
Copper	24.0
Lead	87.7
Mercury	143
Molybdenum	1.59
Nickel	12.9
Selenium	1.34
Silver	9.36
Zinc	68.7

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	3.7
Arsenic	13.3	23.7
Barium	281	447
Beryllium	0.118	0.156
Cadmium	0.172	0.59
Cobalt	7.19	-
Copper	13.0	24
Lead	11.5	88
Mercury	0.418	143
Molybdenum	0.650	1.59
Nickel	25.5	-
Selenium	1.08	1.34
Silver	0.534	9.4
Zinc	60.6	69

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	3.1E+01	1.2E-01
Arsenic	4.0E-01	5.9E+01
Barium	1.5E+04	3.0E-02
Beryllium	3.0E+00	5.2E-02
Cadmium	4.5E+00	1.3E-01
Cobalt	2.3E+01	-
Copper	3.1E+03	7.7E-03
Lead	-	-
Mercury	2.3E+01	6.2E+00
Molybdenum	3.9E+02	4.1E-03
Nickel	4.9E+02	-
Selenium	3.9E+02	3.4E-03
Silver	3.9E+02	2.4E-02
Zinc	2.3E+04	3.0E-03
	HI =>	**6.6E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	1.1E+00	2E-04
Barium	-	-
Beryllium	1.6E+04	1E-10
Cadmium	7.9E+03	7E-10
Cobalt	4.2E+03	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.5E+05	-
Selenium	-	-
Silver	-	-
Zinc	-	-
	ILCR =>	**2E-04**

ATTACHMENT I

Summary Statistics and 95th UCL for Sediment Samples

~ all values are in units of mg/kg ~

Sample	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Zinc
MM-SD-02 (PPE)	0.34	50	81	0.091	0.18	2.8	5.2	7.2	2.9	0.52	6.3	0.53	1.1	33
MM-SD-03 (Dwnstrm)	0.24	36	38	0.032	0.22	2.2	5.1	7	2.6	0.38	3.7	0.7	0.66	25
MM-SD-04	0.93	8.7	280	0.12	1.2	7	19	46	3.6	0.36	28	0.23	4.6	140
MM-SD-05	2.4	8.9	210	0.14	0.29	7.2	30	130	64	0.4	23	0.29	4.5	59
MM-SD-06	2.7	16	270	0.19	0.93	6.9	78	180	740	0.71	24	0.77	19	99
MM-SD-07	6.2	17	400	0.14	1.4	4.7	85	360	410	1.8	12	2	17	100
MM-SD-08	0.26	5.7	86	0.061	0.24	3	7	6.1	0.5	0.39	8.5	0.61	0.23	38
Minimum =>	**0.24**	**5.7**	**38**	**0.032**	**0.18**	**2.2**	**5.1**	**6.1**	**0.50**	**0.36**	**3.7**	**0.23**	**0.23**	**25**
95th UCL =>	**3.46**	**32.5**	**292**	**0.150**	**1.02**	**6.4**	**58.1**	**202**	**2020**	**1.03**	**22.2**	**1.17**	**12.5**	**102**
Maximum =>	**6.2**	**50**	**400**	**0.19**	**1.4**	**7.2**	**85**	**360**	**740**	**1.8**	**28**	**2**	**19**	**140**

95th UCL exceeds maximum value. Maximum value used in risk calculations.

Risk Calculations for Recreational User Receptor

~ SEDIMENT SAMPLES (Sediment 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	3.46
Arsenic	32.5
Barium	292
Beryllium	0.150
Cadmium	1.02
Cobalt	6.44
Copper	58.1
Lead	202
Mercury*	740
Molybdenum	1.03
Nickel	22.2
Selenium	1.17
Silver	12.5
Zinc	102

* Maximum detected concentration.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	3.46
Arsenic	13.3	32.5
Barium	281	292
Beryllium	0.118	0.150
Cadmium	0.172	1.02
Cobalt	7.19	-
Copper	13.0	58.1
Lead	11.5	202
Mercury	0.418	740
Molybdenum	0.650	1.03
Nickel	25.5	-
Selenium	1.08	1.17
Silver	0.534	12.5
Zinc	60.6	102

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	2.3E+02	1.5E-02
Arsenic	3.5E+00	9.3E+00
Barium	9.5E+04	3.1E-03
Beryllium	2.7E+01	5.6E-03
Cadmium	3.9E+01	2.6E-02
Cobalt	2.0E+02	-
Copper	2.7E+04	2.2E-03
Lead	-	-
Mercury	1.5E+02	5.1E+00
Molybdenum	3.3E+03	3.1E-04
Nickel	4.3E+03	-
Selenium	3.3E+03	3.5E-04
Silver	3.3E+03	3.8E-03
Zinc	2.0E+05	5.1E-04
		HI => **1.4E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	9.2E+00	4E-05
Barium	-	-
Beryllium	1.4E+05	1E-11
Cadmium	6.9E+04	1E-10
Cobalt	3.7E+04	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.3E+06	-
Selenium	-	-
Silver	-	-
Zinc	-	-
		ILCR => **4E-05**

Risk Calculations for Recreational Cabin Occupant Receptor

~ SEDIMENT SAMPLES (Sediment 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	3.46
Arsenic	32.5
Barium	292
Beryllium	0.150
Cadmium	1.02
Cobalt	6.44
Copper	58.1
Lead	202
Mercury	740
Molybdenum	1.03
Nickel	22.2
Selenium	1.17
Silver	12.5
Zinc	102

* Maximum detected concentration.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	3.46
Arsenic	13.3	32.5
Barium	281	292
Beryllium	0.118	0.150
Cadmium	0.172	1.02
Cobalt	7.19	-
Copper	13.0	58.1
Lead	11.5	202
Mercury	0.418	740
Molybdenum	0.650	1.03
Nickel	25.5	-
Selenium	1.08	1.17
Silver	0.534	12.5
Zinc	60.6	102

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	1.9E+02	1.8E-02
Arsenic	2.9E+00	1.1E+01
Barium	7.9E+04	3.7E-03
Beryllium	2.2E+01	6.8E-03
Cadmium	3.3E+01	3.1E-02
Cobalt	1.7E+02	-
Copper	2.2E+04	2.6E-03
Lead	-	-
Mercury	1.2E+02	6.1E+00
Molybdenum	2.8E+03	3.7E-04
Nickel	3.5E+03	-
Selenium	2.8E+03	4.2E-04
Silver	2.8E+03	4.5E-03
Zinc	1.7E+05	6.2E-04
		HI => **1.7E+01**

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	7.7E+00	4E-05
Barium	-	-
Beryllium	1.2E+05	1E-11
Cadmium	5.7E+04	2E-10
Cobalt	3.1E+04	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.1E+06	-
Selenium	-	-
Silver	-	-
Zinc	-	-
		ILCR => **4E-05**

Risk Calculations for Construction Worker Receptor

~ SEDIMENT SAMPLES (Sediment 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	3.46
Arsenic	32.5
Barium	292
Beryllium	0.150
Cadmium	1.02
Cobalt	6.44
Copper	58.1
Lead	202
Mercury	740
Molybdenum	1.03
Nickel	22.2
Selenium	1.17
Silver	12.5
Zinc	102

* Maximum detected concentration.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	3.46
Arsenic	13.3	32.5
Barium	281	292
Beryllium	0.118	0.150
Cadmium	0.172	1.02
Cobalt	7.19	-
Copper	13.0	58.1
Lead	11.5	202
Mercury	0.418	740
Molybdenum	0.650	1.03
Nickel	25.5	-
Selenium	1.08	1.17
Silver	0.534	12.5
Zinc	60.6	102

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	7.2E+01	4.8E-02
Arsenic	1.2E+00	2.7E+01
Barium	2.0E+03	1.5E-01
Beryllium	2.9E+00	5.1E-02
Cadmium	1.4E+00	7.5E-01
Cobalt	2.0E+01	-
Copper	1.2E+04	4.7E-03
Lead	-	-
Mercury	3.3E+01	2.2E+01
Molybdenum	1.5E+03	6.7E-04
Nickel	5.7E+01	-
Selenium	1.5E+03	7.7E-04
Silver	1.5E+03	8.1E-03
Zinc	9.3E+04	1.1E-03
	HI =>	5.0E+01

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	2.4E+01	1E-05
Barium	-	-
Beryllium	1.3E+03	1E-09
Cadmium	7.3E+02	1E-08
Cobalt	3.4E+02	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.2E+04	-
Selenium	-	-
Silver	-	-
Zinc	-	-
	ILCR =>	1E-05

Risk Calculations for Residential Receptor

~ SEDIMENT SAMPLES (Sediment 95th UCL risk values) ~

CONCENTRATIONS (mg/kg)

COPC	95th UCL
Antimony	3.46
Arsenic	32.5
Barium	292
Beryllium	0.150
Cadmium	1.02
Cobalt	6.44
Copper	58.1
Lead	202
Mercury	740
Molybdenum	1.03
Nickel	22.2
Selenium	1.17
Silver	12.5
Zinc	102

* Maximum detected concentration.

BACKGROUND COMPARISON

COPC	BTV (mg/kg)	95th UCL
Antimony	0.531	3.46
Arsenic	13.3	32.5
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Copper	13.0	58.1
Lead	11.5	202
Mercury	0.418	740
Molybdenum	0.650	1.03
Nickel	25.5	-
Selenium	1.08	1.17
Silver	0.534	12.5
Zinc	60.6	102

HQ and HI VALUES

COPC	RBC_{HI} (mg/kg)	HQ
Antimony	3.1E+01	1.1E-01
Arsenic	4.0E-01	8.1E+01
Barium	1.5E+04	1.9E-02
Beryllium	3.0E+00	5.0E-02
Cadmium	4.5E+00	2.3E-01
Cobalt	2.3E+01	-
Copper	3.1E+03	1.9E-02
Lead	-	-
Mercury	2.3E+01	3.2E+01
Molybdenum	3.9E+02	2.7E-03
Nickel	4.9E+02	-
Selenium	3.9E+02	3.0E-03
Silver	3.9E+02	3.2E-02
Zinc	2.3E+04	4.4E-03
	HI =>	1.1E+02

ILCR VALUES

COPC	RBC_{ILCR} (mg/kg)	ILCR
Antimony	-	-
Arsenic	1.1E+00	3E-04
Barium	-	-
Beryllium	1.6E+04	9E-11
Cadmium	7.9E+03	1E-09
Cobalt	4.2E+03	-
Copper	-	-
Lead	-	-
Mercury	-	-
Molybdenum	-	-
Nickel	1.5E+05	-
Selenium	-	-
Silver	-	-
Zinc	-	-
	ILCR =>	3E-04