

Site Safety and Health Plan

Restoration of Abandoned Mines (RAMS) Project

Bullion Mine, Montana

Drilling of Soil Borings, Soil Sampling, Waste Rock Sampling,
Global Positioning Satellite (GPS), Surface Water Monitoring,
and Topographic Surveys

PREPARED FOR:
U.S. Army Corps of Engineers, Omaha
106 South 15th Street
Omaha, Nebraska 68102

PREPARED BY:
Gant Massey and Clare Fitzgerald
Bitterroot Restoration, Inc.

Sept. 2002

Site Safety and Health Plan Disclaimer

The following Site Safety and Health Plan (SSHP) has been designed for the methods presently contemplated by Bitterroot Restoration, Inc. for execution of the proposed work. Therefore, the SSHP may not be appropriate if the work is not performed by or using the methods presently contemplated. In addition, as the work is performed, conditions different from those anticipated may be encountered and the SSHP may have to be modified.

Table of Contents

- Bullion Mine Addendum..... 1
- 1.0 Site Characterization and Analysis 1
 - 1.1 Location and approximate size of site:..... 1
 - 1.2 Duration of planned employee activity: 1
 - 1.3 Site elevation and topography:..... 1
- 2.0 Emergency Information 1
- 3.0 List of Personnel and training/medical requirements 2
- 4.0 Site-specific Job Hazard Assessments..... 2
- 5.0 Action Levels 5
- 6.0 Site Surveillance/Monitoring 5

- 1.0 Introduction..... 6-1
 - 1.1 Objective 6-1
 - 1.2 References..... 6-1
- 2.0 Responsibilities..... 2-1
 - 2.1 All Personnel..... 2-1
 - 2.2 Health and Safety Manager 2-1
 - 2.3 Project Manager..... 2-1
 - 2.4 Site Supervisor..... 2-1
 - 2.5 Site Health and Safety Officer..... 2-2
 - 2.6 Subcontractors..... 2-2
 - 2.7 On-Site Personnel and Visitors 2-2
- 3.0 Project Hazards and Control Procedures 3-1
 - 3.1 Scope of Work 3-1
 - 3.1.1 General Overview..... 3-1
 - 3.1.2 Supporting Tasks 3-1
 - 3.1.3 Job Hazard Assessment 3-2
 - 3.2 Field Activities, Hazards, Control Procedures 3-2
 - 3.2.1 Mobilization/Site Preparation/Demobilization 3-2
 - 3.2.2 Decontamination Activities 3-3
 - 3.2.3 Drilling Activities **Error! Bookmark not defined.**
 - 3.2.4 Soil/Groundwater/Surface Sampling Activities/Hazards 3-3
 - 3.2.5 Well Development Activities/Hazards. **Error! Bookmark not defined.**

3.2.6	Geophysical, Global Positioning Satellite (GPS) and topographic survey activities/Hazards	3-4
3.2.7	Installation of Mechanical, hydrogeologic, and climatic instrumentation	Error! Bookmark not defined.
3.2.8	Demobilization.....	3-4
3.3	Chemical Hazards.....	3-5
4.0	Hazards and Control Procedures	3-1
4.1	General Practices	3-1
4.1.1	Buddy System	3-2
4.2	Sunburn/Ultraviolet Exposure	3-2
4.2.1	Sunburn/Ultraviolet Exposure Prevention.....	3-3
4.3	Heat Stress	3-3
4.3.1	Heat Stress Prevention	3-3
4.4	Cold Stress	3-5
4.4.1	Cold Stress Prevention.....	3-5
4.5	High Altitude stress	3-6
4.6	Biological Hazards	3-6
4.6.1	Venomous Snakes and Arthropods.....	3-6
4.6.2	Pathogens	3-9
4.7	Noise.....	3-10
4.7.1	Hearing Conservation.....	3-10
4.8	Spill Control Plan	3-11
4.9	Lockout/Tagout Procedures	3-11
4.10	Sanitation.....	3-11
4.10.1	Break Area	3-11
4.10.2	Potable Water	3-11
4.10.3	Sanitary Facilities	3-12
4.10.4	Lavatory	3-12
4.10.5	Trash Collection	3-12
4.11	Electrical Hazards	3-12
4.12	Lifting Hazards.....	3-13
4.13	Dust Control.....	3-14
4.14	Construction Equipment Safety Procedures	3-14
4.15	Chemical Hazards	3-15
5.0	Personal Protective Equipment	3-1
5.1	Levels of Protection	3-1

5.1.1	Level D Protection	3-1
5.1.2	Modified Level D Protection	Error! Bookmark not defined.
5.1.3	Selection of PPE	3-2
5.2	Using PPE.....	3-2
6.0	Site Control.....	3-1
6.1	Authorization to Enter	Error! Bookmark not defined.
6.2	Hazard Briefing	3-1
6.3	Certification Documents.....	Error! Bookmark not defined.
6.4	Field Activity Daily Log.....	3-1
6.5	Entry Requirements	Error! Bookmark not defined.
6.6	Emergency Entry and Exit.....	3-1
7.0	Decontamination.....	3-1
7.1	Contamination Control Zones	3-1
7.1.1	Exclusion Zone.....	3-1
7.1.2	Contamination Reduction Zone.....	3-1
7.1.3	Support Zone	3-1
7.2	Posting.....	3-1
7.3	Decontamination General Rules	3-1
7.4	Equipment Decontamination.....	3-2
7.5	Personal Protective Equipment Decontamination.....	3-2
8.0	Employee Training.....	3-1
8.1	Site-Specific Training.....	3-1
8.2	First Aid and CPR	3-1
9.0	Medical Surveillance.....	3-1
9.1	First Aid and Medical Treatment.....	3-1
9.2	Medical Restriction	3-1
10.0	Emergency Procedures	3-1
10.1	General.....	3-1
10.2	Emergency Response.....	3-1
10.2.1	Fire	3-1
10.2.2	Spill	3-2
10.3	Safety Signals.....	3-2
10.4	Medical Emergency	3-2
10.4.1	First Aid—General.....	3-2
10.4.2	First Aid—Inhalation.....	3-3
10.4.3	First Aid—Ingestion	3-3

10.4.4 First Aid—Skin Contact	3-3
10.4.5 First Aid—Eye Contact.....	3-3
10.5 Reporting Injuries and Illnesses.....	3-4
10.6 Emergency Information.....	3-4

List of Appendices

<i>Appendix</i>	<i>Title</i>
A	Material Safety Data Sheets
B	ENG 3394 Accident Reporting Form
C	Information on Bats and Rabies

Site Safety and Health Plan Approvals And Acknowledgments

Approvals

I have read and approved this Site Safety and Health Plan (SSHP) with respect to project hazards, regulatory requirements, and the following Standard Operating procedures (located in the RAMS General Work Plan):

A1	Surface Soil/Rock Sampling Equipment and Procedures
A3	Subsurface Soil/Rock Sampling Equipment and Procedures
A4	Soil/Rock Homogenization Equipment and Procedures
A7	Investigative Derived Waste Procedures
A11	Surface Water and Sediment Sampling Equipment and Procedures
A12	Equipment Decontamination Procedures
A13	Sample Handling, Documentation, and Tracking Procedures
A14	Field Documentation
A15	Survey Equipment and Procedures

Project Name:	Project Number:
---------------	-----------------

Prepared by: _____
Gant Massey
Clare Fitzgerald

Reviewed by: _____
Kimberlee Mulhern, Omaha District/Date

Reviewed by: _____
Project Manager/Date

Reviewed by: _____
Site Supervisor/Date

Site Safety and Health Plan Acknowledgments

I have read this Site Safety and Health Plan, I understand the contents, and I agree to abide by its requirements I also have been properly trained, medically monitored, for the work that I am to perform and those dates are provided below. Documentation will be placed in the Project Records.

Date	Printed Name	Signature	Company Represented

Bullion Property Addendum

1.0 Site Characterization and Analysis

1.1 Location and approximate size of site:

The Bullion Mine project site is located on the Beaverhead-Deerlodge National Forest approximately eight miles north of Basin, Montana in Section 13 and 14 Township 7 North, and Range 6 West, Montana Principle Meridian. Currently, the Forest Service and EPA are partners in a CERCLA response action at the mine and mill site. However, the Forest Service has identified eroded tailings that have re-deposited downstream from the site. The project site consists of approximately a half-mile of tailings along Jack and “Jill” Creeks, which lead to Basin Creek, a major tributary of the Boulder River.

1.2 Duration of planned employee activity:

Project assessment will be performed beginning the week of 22 September 2002. The field effort will be completed before 29 September.

1.3 Site elevation and topography:

The site is located on the Beaverhead-Deerlodge National Forest at elevations ranging from 6,300 to 7,100 feet.

2.0 Emergency Information

Agency	Telephone Number
Ambulance Hospital Emergency Care Poison Control Center Fire Police	911
CHEMTREC	800-424-9300
CDC	404-452-4100 or 404-329-2888
National Response Center	800-424-8802
Pesticide Information Center	800-845-7633
EPA ERT Emergency	201-321-6660

Agency	Telephone Number
Other Phone Numbers: Project Manager: Kim Mulhern Site Supervisor: Gant Massey Safety and Health Coordinator: Gant Massey	(402) 221-7735 (406) 961-4991
Site Resources: Drinking water supply Mobile telephone First aid kit Spill response materials	Keep readily available Locations noted prior to work and covered in the Tailgate Safety Meeting
Hospital: St. James Healthcare 400 South Clark Street Butte, MT 59701	(406) 723-2500

3.0 List of Personnel and training/medical requirements

	Office	Mobile	Emergency
Site Health/Safety Officer Gant Massey:	(406) 961-4991		
Site Supervisor Gant Massey	(406) 961-4991		
Samplers			

4.0 Site-specific Job Hazard Assessments

Task 1: Mobilization and demobilization

Principal steps	Potential safety and health hazards	Recommended controls	SSHP reference
1. Traveling to and from site	<ul style="list-style-type: none"> Collision with other motorist or deer or other wildlife 	<ul style="list-style-type: none"> Drive defensively All vehicle occupants must wear seat belts Drive only on established roads Properly stow cargo Avoid distracters such as beverages, mobile telephones, or radios 	Section 3.2.1

2. Hiking to and from sample locations	<ul style="list-style-type: none"> • Slips/trips/falls • Biological hazards • Heat injuries 	<ul style="list-style-type: none"> • Wear over-the-ankle boots • Carry equipment in boxes or bags • Wear sunscreen and insect repellent and avoid contact with foliage • Drink plenty of water or decaffeinated, not-alcoholic beverages • Dress appropriately, including a hat with a sun visor 	Section 4.2 Section 4.3 Section 4.5 Section 4.13
Equipment to be used	Inspection requirements		Training requirements
Commercial automobile	<ul style="list-style-type: none"> • Check fluid levels in engine, transmission, and coolant reservoir daily • Check operation of accessories such as windshield wipers, four-wheel drive, and driving lights before operation daily. 		Valid driver's license

Task 2: Surface water and sediment sampling

Principal steps	Potential safety and health hazards	Recommended controls	SSHP reference
1. Flow rate measurement 2. Water sample collection 3. Sample packaging	<ul style="list-style-type: none"> • Slips/trips/falls • Biological hazards • Heat injuries 	<ul style="list-style-type: none"> • Obtain solid footing when standing next to a stream, avoid standing on loose gravel or mud • Wear over-the-ankle boots • Wear sunscreen and insect repellent • Avoid contact with foliage • Drink plenty of water or decaffeinated, not-alcoholic beverages • Dress appropriately • Wear PPE 	Section 4.2 Section 4.3 Section 4.5 Section 4.13 Section 5.3 Section 7.0
Equipment to be used	Inspection requirements		Training requirements
Flow Probe Hand-held Flowmeter	Follow manufacturer's recommendations		None
PH meter	Follow manufacturer's recommendations		None
Conductivity meter	Follow manufacturer's recommendations		None
GPS unit	Follow manufacturer's recommendations		None

Task 3: Mine waste rock and Soil Sampling

Principal steps	Potential safety and health hazards	Recommended controls	SSHP reference

<ol style="list-style-type: none"> 1. Drill holes with auger 2. Mine waste & soil sample collection 3. Sample mixing 4. Sample packaging 	<ul style="list-style-type: none"> • Auger accidents • Slips/trips/falls • Biological hazards • Heat injuries • Exposure to toxic chemicals in mine wastes and soils 	<ul style="list-style-type: none"> • Obtain solid footing when standing next to a stream, avoid standing on loose gravel or mud • Wear over-the-ankle boots • Wear sunscreen and insect repellent • Avoid contact with foliage • Drink plenty of water or decaffeinated, not-alcoholic beverages • Dress appropriately, including a hat with a sun visor • Wear PPE • Do not eat, drink, or use tobacco products during these steps 	<p>Section 4.2 Section 4.3 Section 4.5 Section 4.13 Section 5.3 Section 7.0</p>
Equipment to be used	Inspection requirements		Training requirements
Mechanical auger	Follow manufacturer's recommendations		None
GPS unit	Follow manufacturer's recommendations		None

Task 4: Biological stream assessment

Principal steps	Potential safety and health hazards	Recommended controls	SSHP reference
<ol style="list-style-type: none"> 1. Vegetation inventory 2. Geomorphic inventory 	<ul style="list-style-type: none"> • Slips/trips/falls • Biological hazards • Heat injuries 	<ul style="list-style-type: none"> • Obtain solid footing when standing next to a stream, avoid standing on loose gravel or mud • Wear over-the-ankle boots • Wear sunscreen and insect repellent • Drink plenty of water or decaffeinated, not-alcoholic beverages • Dress appropriately, including a hat with a sun visor • Wear PPE 	<p>Section 4.2 Section 4.3 Section 4.5 Section 4.13 Section 5.3 Section 7.0</p>
Equipment to be used	Inspection requirements		Training requirements
GPS unit	Follow manufacturer's recommendations		None

5.0 Action Levels

Parameter	Value	Action
Organic Vapors	Not required	
Noise	Not required	
Heat	Not required	
Flammable vapors	Not required	
Other (specify)		

6.0 Site Surveillance/Monitoring

Instrument	Surveillance Frequency	Monitoring Location and Tasks	Calibration
Not required			

NOTES:

1. Personnel performing safety inspections and conducting monitoring for chemical and physical exposures shall be qualified through education, training, experience or any combination of these and with authorization from their respective company.
2. All monitoring equipment will be maintained in accordance with manufacturer's written instructions. Factory maintenance and calibration will be accomplished per the manufacturer's specifications. Field calibrations and source checks will be accomplished per the manufacturer's written instructions and/or company operating procedures. All maintenance and calibrations will be formally documented and included in the project files

1.0 Introduction

1.1 Objective

This project involves proposed tasks at various locations associated with the Restoration of Abandoned Mines (RAMS) project. The site activities include: collection of soil/sediment/water samples for chemical analysis, collection of waste rock samples for chemical analysis, a biological and geomorphic stream inventory, and conducting a topographical survey. Bitterroot Restoration, Inc. will perform the work.

The objective of this Site Safety and Health Plan (SSHP) is to provide a mechanism for establishing safe working conditions at the sites. The safety organization, procedures, and protective equipment have been established based upon an analysis of potential hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential of accident or injury.

This SSHP will serve as a general guidance document for use at all of the sites. Specific addendum will be developed for each site and will include site-specific information where applicable. Information to be included in the addenda will include site/hospital maps, and features, planned activities and hazards unique to each site. Specific personnel assigned to work at each site will also be included.

This SSHP prescribes the procedures that must be followed during referenced site activities. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of the Project Manager.

The provisions of this plan are mandatory for all personnel and subcontractors assigned to the project. All visitors to the work site must abide by the requirements of this plan.

1.2 References

This SSHP complies with applicable Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), and US Army Corps of Engineers policies and procedures. This plan follows the guidelines established in the following:

Standard Operating Safety Guides, EPA (Publication 9285.1-03, June 1992).

Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, National Institute for Occupational Safety and Health (NIOSH), OSHA, U.S. Coast Guard (USCG), EPA (86-116, October 1985).

Title 29 of the Code of Federal Regulations (CFR), Part 1910.120, *Hazardous Waste Operations and Emergency Response* (HAZWOPER).

Title 29 of the CFR, Parts 1910 *Construction Industry Standards* and 1926 *General Industry Standards*.

Pocket Guide to Chemical Hazards, Department of Health and Human Services, U.S. Public Health Service, Centers for Disease Control, NIOSH.

Quick Selection Guide to Chemical Protective Clothing, Forsberg, K. and S.Z. Mansdorf, 3rd Ed.

Army Regulation (AR) 385-40, Accident Reporting and Records, 1 November 1994 (http://www.usapa.army.mil/pdffiles/r385_40.pdf) and USACE Supplement to AR 385-40 (<http://www.usace.army.mil/inet/usace-docs/occe/ar385-40/toc.htm>).

Engineer Manual (EM) 385-1-1 *Safety and Health Requirements Manual*

Engineer Regulation (ER) 385-1-92 *Safety and Occupational Health Requirements for HTRW Activities*

2.0 Responsibilities

2.1 All Personnel

All personnel must adhere to these health and safety procedures during the performance of their work. Each person is responsible for completing tasks safely, and reporting any unsafe acts or conditions to his or her immediate supervisor, the Site Health and Safety Officer (SHSO), or to the Site Supervisor. No person may work in a manner that conflicts with the letter or the intent of, or the safety and environmental precautions expressed in these procedures. After due warnings, the Project Manager will dismiss from the site any person who violates safety procedures.

All on-site personnel will receive training in accordance with 29 CFR 1910.120 and will be familiar with the requirements and procedures contained in this document.

2.2 Health and Safety Manager

The Health and Safety Manager (HSM) is responsible for technical health and safety aspects of the project, including preparation of this SSHP. Inquiries regarding project procedures, and other technical or regulatory issues related to health and safety should be addressed to this individual. The HSM for this project is Gant Massey.

2.3 Project Manager

The Project Manager is ultimately responsible for ensuring that all project activities are completed in accordance with the requirements and procedures in this plan. The Project Manager for this site is: Gant Massey.

2.4 Site Supervisor

The Site Supervisor is responsible for implementation of the SSHP, including communication of site requirements to all on-site project personnel (including subcontractors) and consultation with the SHSO. The Site Supervisor will be responsible for informing the SHSO of any changes in the work plan or procedures so that those changes may be addressed in the SSHP. Other responsibilities include:

Stopping work, as required, to ensure personal safety and protection of property, or in cases of life or property-threatening safety noncompliance

Determining and posting routes to medical facilities and emergency telephone numbers, and arranging emergency transportation to medical facilities

Notifying local public emergency officers of the nature of the site operations, and posting of their telephone numbers in an appropriate location

Observing on-site project personnel for signs of chemical or physical trauma

Ensuring that all site personnel have the proper medical clearance, have met applicable training requirements, and have training documentation available.

2.5 Site Health and Safety Officer

The SHSO will assist the Site Supervisor in carrying out the requirements of this SSHP. The SHSO is responsible for and modifying this SSHP if necessary based on field conditions. The Health and Safety Manager or his designee must approve any changes to the SSHP. The SHSO has successfully completed an OSHA Hazardous Waste Operations 40-hour training class, and possesses a certification of a current 8-hour update. The SHSO will ensure the conduct of a daily tailgate safety meeting to include all personnel on site at the time agreed to by the SHSO. The SHSO is the primary site contact on occupational health and safety.

2.6 Subcontractors

On-site subcontractors and their personnel must understand and comply with the site requirements established in this SSHP. Subcontractors must attend and participate in the daily Tailgate Safety Meetings and all other site safety meetings.

2.7 On-Site Personnel and Visitors

All personnel must read and acknowledge their understanding of this SSHP, abide by the requirements of the plan, and cooperate with site supervision in ensuring a safe and healthful work site. Site personnel will immediately report any of the following to the Site Supervisor or Site Safety Officer:

Accidents and injuries, no matter how minor

Unexpected or uncontrolled release of chemical substances

Symptoms of chemical exposure

Unsafe or malfunctioning equipment

Changes in site conditions that may affect the health and safety of project personnel.

3.0 Project Hazards and Control Procedures

3.1 Scope of Work

3.1.1 General Overview

The scope of work varies for each of the proposed sites associated with the Restoration of Abandoned Mines (RAMS) project. A specific site description and scope will be included with the SSHP addendum for each site. Site activities include the collection of soil/sediment/ water samples for chemical analysis, collection of waste rock samples for chemical analysis, a biological and geomorphic stream inventory, and a topographical survey. Bitterroot Restoration, Inc. will perform the work. The chief materials of interest include: (a) jig rock or tailings resulting from prior mining operations. Tailings represent residue from milling processes. (b) Waste rock from prior mining operations, (c) soils affected by prior mining operations, (d) waters potentially affected by prior mining, and (e) vegetation affected by prior mining. Excessive concentrations of metals, including various EPA and state-regulated metals, and other related contaminants have been reported in surface waters at some of the sites. Known toxic metals regulated by OSHA such as arsenic and lead are known to be present at some of the sites.

3.1.2 Supporting Tasks

The following supporting tasks are expected to be included at one or more of these sites:

Task 1. Mobilization/Demobilization

Mobilize equipment and personnel to the two sites. Decontaminate equipment as necessary. Demobilize from sites.

Task 2. Site Reconnaissance

Determine/flag survey and sampling locations at the site.

Task 3. Collection of Surface Water and Sediment Samples

Collect surface water and sediment samples from affected stream. Sampling will be performed to monitor stream water volumes, levels, flows, and analyte concentrations.

Task 4. Collect Soil/Waste Rock Samples

Collect surface, subsurface soil and rock samples from and around waste rock piles.

Task 5. Conduct biologic and geomorphic stream survey

Inventory types and densities of riparian vegetation. Assess geomorphic characteristics.

Task 6. Conduct Topographic Survey

3.1.3 Job Hazard Assessment

A job hazard assessment is necessary to identify potential safety, health, and environmental hazards associated with each type of field activity. Because of the complex and changing nature of field projects, supervisors must continually inspect the work site to identify hazards that may harm site personnel, the community, or the environment. The Site Supervisor and Site Health and Safety Officer must be aware of these changing conditions and discuss them with the HSM whenever these changes impact the health, safety, or performance of the project. The Site Supervisor will keep subcontractors informed of the changing conditions and the SHSO will write addenda to change Job Hazard Analyses and associated hazard controls as necessary. Site-specific Job Hazard Assessments are in section 12.3.

3.2 Field Activities, Hazards, Control Procedures

3.2.1 Mobilization/Site Preparation/Demobilization

Site mobilization will include establishing exclusion, contamination reduction, and support zones. A break area will be set up in the support zone area. Mobilization may involve clearing areas for the support zones and access road preparation. During this initial phase, project personnel will walk the site to identify safety issues that may have arisen since the writing of this plan.

The hazards of this phase of activity are associated with heavy equipment movement, manual materials handling, and manual site preparation. Manual materials handling and manual site preparation may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion and laceration hazards. The work area presents slip, trip and fall hazards from scattered debris and irregular walking surfaces including open shafts, and the potential for cavernous ground from mine subsidence. Freezing-weather hazards include frozen, slick and irregular walking surfaces. Wet weather may cause wet, muddy, slick walking surfaces and unstable soil at the excavation.

Potential environmental hazards include venomous snakes and arthropods (i.e., insects, spiders, ticks, scorpions, and centipedes) and other pests such as ants, fleas, mosquitoes, and wasps;

weather, such as sunburn, lightning, rain, snow, ice, heat and cold; pathogens, such as bubonic plague and Hantavirus, and rabies from bats who inhabit many abandoned mines.

3.2.2 Decontamination Activities

Before project commencement, all sampling equipment, including support vehicles, augers, rods, samplers, tools, etc., shall be cleaned as thoroughly as possible given the conditions presented by the field conditions.

3.2.3 Surface Water and Sediment Sampling Activities/Hazards

Surface water quality analyses will include total metals concentrations, specific conductance, hardness, total suspended solids and pH. The physical hazards of this operation are primarily associated with the sample collection methods and procedures utilized.

For the surface water, representative 1-liter composite samples will be collected using a depth integrating wader. Samples will be immediately placed in ice chests in the field and held at approximately 4⁰ C or less. The grab sediment samples will be collected from the streambed at points co-located the surface water sampling location. These 1-liter samples will be stored in containers provided by the analytic laboratory and tested for total metals using the analytic methods outlined for mine wastes.

Flow monitoring will follow USGS protocols and will be done at the same time and location as water quality sampling to allow evaluation of mass loading and the composite stream discharge. The total volume, measured in feet per second, will be recorded in a permanent log book or database.

The primary hazards associated with these specific sampling procedures are not potentially serious; however, there are minor physical hazards. The hazards are generally limited to strains/sprains resulting from rough terrain, weather-related conditions, or carrying heavy sample coolers.

3.2.4 Surface and Subsurface Mine Waste and Soil Sampling Activities/Hazards

Mine waste samples will be collected and analyzed for constituents of potential concern (COPC's) at the Bullion mine. The primary COPC' for the project sites include copper, cadmium, arsenic, lead and zinc. All samples will be analyzed for total metals concentration and a subset of mine waste samples will be analyzed for water extractable metals. Analyses will occur via atomic emission spectrometry (EPA Methods 200.2 series, 200.7). In addition, all

samples will be assessed for acid generating potential (acid based accounting – ABA). The thickness and aerial extent of mine waste will be determined through test pitting and a site survey to allow volume determination.

The primary hazard associated with mine wastes and soil sampling is injuries related to the chainsaw auger that will be used to drill sampling holes. Specifically, operators need to protect themselves from back and wrist injuries. Workers may be exposed to toxic dust on this project, particularly lead. For this contaminant of potential concern, it is important that workers avoid inhalation of contaminated dust or contact of toxic substances on the back of the neck. In addition, this task presents minor physical hazards, such as strains/sprains resulting from rough terrain, weather-related conditions, or carrying heavy sample coolers.

3.2.5 Biologic and Geomorphic Survey Activities/Hazards

This phase involves identifying the types, health, and densities of riparian vegetation in the injured area. Determining the types, health, and densities of riparian vegetation in healthy reference areas with conditions similar to the reference area. And, finally, assessing the condition of the stream's geomorphic characteristics.

3.2.6 Global Positioning Satellite (GPS) and topographic survey Activities/Hazards

The primary hazards associated with the survey include slip/trip/fall; operation of vehicles in the area, particularly backing up of support vehicles; sharp objects and spiny plants (if removal of these objects is necessary) and contact with rodents, snakes and other poisonous plants or animals. The work area presents slip, trip and fall hazards from scattered debris and irregular walking surfaces. Freezing weather hazards include frozen, slick and irregular walking surfaces. Wet weather may cause wet, muddy, slick walking surfaces.

3.2.7 Demobilization

Demobilization will involve the removal of all tools, equipment, supplies, and vehicles brought to the site.

The physical hazards of this phase of activity are associated with equipment operation, manual materials handling and manually working with soils. Mechanical auger operation presents noise and vibration hazards. Manual materials handling and manually working with soils may cause blisters, sore muscles joint and skeletal injuries. The work area presents slip, trip and fall hazards from scattered debris and irregular walking surfaces. Freezing weather hazards include

frozen, slick and irregular walking surfaces. Wet weather may cause wet, muddy, slick walking surfaces.

Environmental hazards include venomous arthropods (i.e., insects, spiders, and ticks.) and other pests such as ants, fleas, mosquitoes, and wasps; weather, such as sunburn, lightning, rain, snow, heat and cold; and pathogens, such as west Nile virus from mosquitoes, hantavirus from deer mouse feces/urine and rabies from bats which inhabit many abandoned mines.

Such hazards will be of concern during all phases of this project at all sites. There is also the potential for ergonomic hazards i.e. strains, sprains during all phases of work.

3.3 Chemical Hazards

The chemical hazards associated with site operations are related to inhalation and skin contact to potential site contaminants and chemicals associated with site operations. These site operations include auger drilling and the excavation and collection of surface and subsurface soil, rock and water samples. The chief site contaminant materials of interest include tailings resulting from prior mining operations. Excessive concentrations of lead and arsenic are on the site. Skin contact with highly acidic water may cause skin irritation or dermatitis. Known toxic heavy metals regulated by OSHA such as arsenic and lead are present at Bullion, although employee exposure to these substances in excess of OSHA exposure limits is unlikely. Exposure avoidance and personal protective equipment for specific hazardous materials will be discussed in the site-specific supplements if warranted. VOCs, SVOCs, TPH, herbicides, pesticides, PCBs, and HE are not known to be present.

The operational materials that may be on site to conduct site operations are gasoline, lubricants, hydraulic and motor oils, and laboratory glassware cleaners such as distilled/deionized water. Small quantities of sample preservatives will be used. Decontamination of non-disposable sampling equipment will occur. None of the materials listed in this section are expected to pose a significant health hazard.

The Material Safety Data Sheets (MSDS) for materials used on site are included in Appendix B to satisfy the requirements of the Hazard Communication Standard, OSHA 29 CFR 1910.1200.

4. Hazards and Control Procedures

4.2 General Practices

At least one copy of this plan must be at the project site, in a location readily available to all personnel. All personnel must read and understand the requirements in this plan before beginning work.

All site personnel must use the buddy system (working in pairs or teams).

Contaminated protective equipment, such as hoses, boots, etc., must not be removed from the regulated area before being cleaned or properly packaged and labeled.

Legible and understandable precautionary labels that comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200) must be affixed prominently to tightly closed containers of contaminated waste, debris, and clothing. Current Material Safety Data Sheets (MSDS) must be maintained for all hazardous materials brought on to the site such as gasoline, diesel fuel, decontamination solutions, and preservatives.

Removing contaminated soil from protective clothing or equipment by blowing, shaking, or any other means that disperses contaminants into the air is prohibited.

Food, beverages, or tobacco products must not be present or consumed in the regulated area.

Cosmetics must not be applied within the designated exclusion zone for each site.

Containers must be moved only with the proper equipment, and must be secured to prevent dropping or loss of control during transport.

Emergency equipment must be removed from storage areas and staged in readily-accessible locations. This includes such items as the first aid kit, fire extinguishers, and eye wash station.

Employees must inform their partners or fellow team members of non-visible effects of exposure to toxic materials. The symptoms of such exposure may include:

Headaches

Dizziness

Nausea

Blurred vision

Cramps

Irritation of eyes, skin, or respiratory tract.

Visitors to the site must abide by the following:

- All visitors must be instructed to stay outside the contaminated zones (exclusion and contamination reduction zone) and remain within the support zone during the extent of their stay. Visitors must be cautioned to avoid skin contact with surfaces that are or suspected to be contaminated.
- Visitors requesting to observe work in the exclusion zone must don all appropriate PPE prior to entry into that zone, and must be cleared for hazardous waste work as evidenced by a complete physical examination; have 40-hours of hazardous waste operations training; and have 8-hours of refresher training within the past 12 months.

4.2.6 Buddy System

All on-site personnel must use the buddy system. Visual contact must be maintained between crewmembers at all times, and crewmembers must observe each other for signs of chemical exposure. Indication of adverse effects includes, but are not limited to:

- Changes in complexion and skin coloration
- Changes in coordination
- Changes in demeanor
- Excessive salivation and pupillary response
- Changes in speech pattern.

Team members must also be aware of potential exposure to possible safety hazards, unsafe acts, or noncompliance with safety procedures.

If protective equipment or noise levels impair communications, prearranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

4.3 Sunburn/Ultraviolet Exposure

Overexposure to ultraviolet (UV) radiation may damage the skin and cause sunburn. Chronic exposure to sunlight, especially the UV-B component, accelerates skin aging and increases the risk of skin cancer. Fair-skinned individuals are very prone to this effect; however, increased skin pigmentation reduces the skin sensitivity by as much as a factor of 10.

Sunburn also increases an individual's susceptibility to other forms of heat stress. Any worker with sunburn must pay extra attention to the prevention of heat cramps, heat exhaustion, and/or heat stroke.

4.3.6 Sunburn/Ultraviolet Exposure Prevention

The following methods can be used to avoid overexposure to UV rays from the sun:

Minimize exposure to the sun between 10:00 a.m. and 2:00 p.m. because rays are the most powerful during this period.

Wear protective clothing (long sleeves, hats with protective brims, long pants) that provides the most coverage, consistent with the job to be performed.

Protect eyes during sun exposure with UV-absorbing sunglasses or tinted safety glasses. Ophthalmologists recommend lenses that have UV absorption of at least 90 percent.

Use a commercial sun screen (minimum SPF-15)

Sunscreen should be applied 15 to 30 minutes before exposure to the sun and reapplied often (every 60 to 90 minutes). It is best to use a sunscreen that claims to protect against both UV-B and UV-A rays (some offer only UV-B protection).

4.4 Heat Stress

Wearing PPE may put site personnel at increased risk of heat stress. Heat stress effects range from transient heat fatigue to serious illness and death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is one of the most common and potentially serious illnesses during field operations, alertness to the symptoms and knowledge of preventive measures are vital.

Heat stress monitoring should commence when personnel are wearing impermeable PPE and the ambient temperature exceeds 78 degrees Fahrenheit (°F). If impermeable garments are not worn, heat stress monitoring should commence at 90 F. Table 2 should be used to determine protective measures during heat stress monitoring.

4.4.6 Heat Stress Prevention

One or more of the following control measures can be used to help control heat stress and are mandatory if any site worker has a heart rate (measure as early as possible during rest period) exceeding 75 percent of the calculated maximum heart rate ($MHR = 200 - \text{age}$) or an oral temperature of 99.6 °F:

Site workers will be encouraged to drink plenty of water and electrolyte replacement fluids throughout the day.

On-site drinking water will be kept cool (50 to 60 °F) to encourage personnel to drink frequently.

A work regimen that will provide adequate rest periods for cooling down will be established, as required, but generally a one-third-work shift reduction until sustained heart rate is below 75 percent of their calculated maximum heart rate and oral temperatures are kept at or below 99.6 °F. Workers shall not be allowed to return to work if their sustained heart rate is above the 75 percent calculated maximum OR if their oral temperature exceeds 100.4 °F.

All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.

Cooling devices such as vortex tubes or cooling vests should be used when personnel must wear impermeable clothing in conditions of extreme heat.

Employees should be instructed to monitor themselves and coworkers for signs of heat stress and to take additional breaks as necessary.

A shaded rest area must be provided. All breaks should take place in the shaded rest area.

Employees must not be assigned to other tasks during breaks.

Employees must remove impermeable garments during rest periods. This includes white Tyvek-type garments.

All employees must be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

Heat Cramps: heavy sweating and inadequate electrolyte replacement cause Heat cramps. Signs and symptoms include muscle spasms and pain in the hands, feet, and abdomen.

Heat Exhaustion: Heat exhaustion occurs from increased stress on various body organs. Signs and symptoms include: pale, cool, moist skin; heavy sweating; dizziness, nausea; and fainting.

Stroke: Heat stroke is the most serious form of heat stress and should always be treated as a medical emergency. The body's temperature regulation system fails, and the body temperature rapidly rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Signs and symptoms of heat stroke include: red, hot, usually dry skin;

lack of, or reduced perspiration; nausea; dizziness and confusion; strong, rapid pulse and confusion; and coma.

4.5 Cold Stress

Cold and/or wet environmental conditions can place workers at risk of a cold-related illness. Hypothermia can occur whenever temperatures are below 45 °F, and is most common during wet, windy conditions, with temperatures between 30 to 40 °F. The principal cause of hypothermia in these conditions is loss of insulating properties of clothing due to moisture, coupled with heat loss due to wind and evaporation of moisture on the skin.

Frostbite, the other illness associated with cold exposure, is the freezing of body tissue, which ranges from superficial freezing of surface skin layers to deep freezing of underlying tissue. Frostbite will only occur when ambient temperatures are below 32 °F. The risk of frostbite increases as the temperature drops and wind speed increases.

4.5.6 Cold Stress Prevention

Most cold-related worker fatalities have resulted from failure to escape low environmental air temperatures or from immersion in low temperature water. The single most important aspect of life-threatening hypothermia is a fall in the deep core temperature of the body.

Site workers should be protected from exposure to cold so that the deep core temperature does not fall below 96.8 °F. Lower body temperatures will very likely result in reduced mental alertness, reduction in rational decision-making, or loss of consciousness with the threat of fatal consequences. To prevent such occurrence, the following measures will be implemented:

Site workers must wear warm clothing such as mittens, heavy socks, etc., when the air temperature is below 45 °F. Protective clothing, such as Tyvek or other disposable coveralls, may be used to shield employees from the wind.

When the air temperature is below 35 °F, employees must wear clothing for warmth, in addition to chemical protective clothing. This will include:

- Insulated suits, such as whole body thermal underwear
- Wool socks or polypropylene socks to keep moisture off the feet
- Insulated gloves
- Insulated boots
- Insulated head cover such as hard hat, winter liner, or knit cap
- Insulated jacket, with wind and water-resistant outer layer.

At air temperatures below 35 °F, the following work practices must be implemented:

- If the clothing of a site worker might become wet on the job site, the outer layer of clothing must be water impermeable.
- If a site worker's underclothing becomes wet in any way, the worker must change into dry clothing immediately. If the clothing becomes wet from sweating (and the employee is not uncomfortable), the employee may finish the task at hand prior to changing into dry clothing.
- Site workers must have a warm (65 °F or above) break area.
- Hot liquids such as soups or warm, sweet drinks must be provided in the break area. The intake of coffee and tea should be limited, due to their circulatory and diuretic effects.
- The buddy system must be practiced at all times on site. Any site worker observed with severe shivering must leave the work area immediately.
- Site workers should dress in layers, with thinner lighter clothing worn next to the body.
- Site workers should avoid overdressing when going into warm areas or when performing strenuous activities.

4.6 High Altitude stress

The Bullion site is above 6000 feet elevation.

Drink extra water.

Acclimate at mid level elevations.

4.7 Biological Hazards

Biological hazards may include venomous arthropods (i.e., insects, spiders, ticks scorpions, and centipedes) and other pests such as ants, fleas, mosquitoes, and wasps; pathogens such as bubonic plague and Hantavirus and rabies from bats that may frequent abandoned mines.

Exposure to blood-borne pathogens may result from contact with blood or other fluids during administration of first-aid.

4.7.6 Venomous Snakes and Arthropods

Venomous snakes and arthropods, including insects, spiders, ticks, scorpions, centipedes, and others, create a hazard when their habitats are disturbed. Wasp and bee stings account for a number of fatalities each year. In the United States, snakebites rarely kill because effective treatments have been developed. The best defense is to understand where these creatures may be found and to avoid them before they can cause harm. Should a bite or sting occur, first aid should be applied immediately and medical treatment sought as follows:

Black Widow Spider (*Latrodectus* spp.) is a sedentary web spider found in most warm parts of the world. Only the females bite and then only if threatened or molested. The spider's perception of a threat may be different from your intent. The bite may go unnoticed and may not hurt, but the subsequent severe abdominal pain from a black widow's bite resembles appendicitis. There is pain also in muscles and in the soles of the feet but usually no swelling at the site of the bite. Alternately, the saliva flows freely, then the mouth is dry. The bite victim sweats profusely. The eyelids are swollen. The patient usually recovers after several days of agony. Physicians can relieve the severe pain by injection of calcium gluconate. Antivenin is available; however, there is no first-aid treatment for any spider bite. Black widows are common throughout New Mexico, except perhaps at high altitudes.

Brown Spider (also known as brown recluse spider, violin spider) (*Loxosceles* spp.) commonly lives in houses or on the floor or behind furniture. Bites occur when a spider rests in clothing or in a towel. There may be no harm at all. In very severe cases, a red zone appears around the bite, then a crust forms and falls off. The wound grows deeper and does not heal for several months. The spider's venom may cause destruction of red blood cells and other blood changes. The victim may develop chills, fever, joint pains, nausea, and vomiting. In some cases, a generalized rash develops one to two days after the bite. A victim should consult a physician as soon as signs of illness appear. Brown recluse bites and suspected bites have been reported from various parts of New Mexico, especially the southeastern part of the state. However, a specimen of the spider has yet to be collected from the state.

Ticks (suborder Ixodidae) are external parasites of reptiles, birds, and mammals. Most drop off their host after feeding. They molt and then wait on the tips of leaves, forelegs outstretched, ready to attach to any animal brushing past. The bites of some soft-bodied ticks may cause mild paralysis to man. Ticks transmit many diseases, most important, Rocky Mountain spotted fever and Lyme Disease. Ticks attach themselves to the host only with their mouth parts and feed on blood. In removing a tick, take care not to leave mouth parts behind. Ticks are best removed by pulling them off with steady, gentle pressure. The pull must be light enough to not injure the

tick. It may take more than 10 minutes of pulling to remove the tick. Be patient! After tick is removed, wash area thoroughly with soap and water, gently scrubbing the area of the tick bite.

Fleas (order Siphonaptera) can be carriers of bubonic plague. The plague is usually limited to rodent populations, including squirrels and various species of wild mice and rats. The fleas that parasitize rodents will rarely parasitize people; however, contact with freshly dead or ill animals should be avoided.

Ants, bees, wasps, hornets, and yellow jackets (order Hymenoptera) occasionally cause death. Death from the sting of such creatures is almost always due to acute allergic reaction. The stinging apparatus and venom sac sometimes remain at the site of the sting and must be removed. Some relief from the pain can be obtained by applying cold. Soothing lotions, such as calamine, may reduce itching.

IMPORTANT NOTE: If an individual has a history of allergic reactions to insect bites or is subject to attacks of hay fever or asthma, or if they are not promptly relieved of symptoms, call a physician or seek immediate emergency medical treatment. In a highly sensitive person, do not wait for symptoms to appear, since delay can be fatal. Any individual with a known allergy to wasps and bees must notify the SHSO and/or Project Manager/Leader prior to working at the project site.

Rattlesnakes are common in the wilder parts of the United States. Rattlesnakes belong to the family of pit vipers (Crotalinae). These snakes have a pit between the eye and nostril on each side of the head, elliptical pupils, from one to six fangs (but usually two well-developed fangs), and one row of plates beneath the tail. The head is wider than the neck and body. The venom of these snakes affects the circulatory system. All reactions from snakebite are aggravated by acute fear and anxiety. Nonpoisonous snakes have two round pupils, no fangs or pit, a double row of plates beneath the tail, and the head is not wider than the neck and body. The pit viper rattlesnakes are the primary poisonous snakes found in New Mexico. The Arizona coral snake is found only in the area immediately adjacent to the western border.

Controlling Exposure to Venomous Snakes and Arthropods. To minimize the threat of snakebites and insect hazards, all on-site personnel must be made aware (during training) of the potential for encountering snakes and will avoid actions potentiating encounters, such as turning over logs, etc. If snakebite occurs, an attempt should be made to kill the snake for identification. The victim should be transported to the nearest hospital within 30 minutes. First aid consists of

applying a constriction band, washing the area around the wound to remove any unabsorbed venom, and omitting cutting and sucking (unless medical care cannot be obtained within 30 minutes).

4.7.7 Pathogens

Bubonic Plague Information: Individuals should be aware of bubonic plague. The plague is an illness that is caused by bacteria and is most often transmitted to humans by the fleas of rodents. The recommendations provided above for controlling exposures to rodent populations should be followed, and all dead rodents, including rabbits and squirrels, should be avoided.

First Aid - Reference American Red Cross Standard First Aid, 1993

Type	Signals	Care
Insect Bite	Stinger may be present Pain Swelling Possible allergic reaction	Remove stinger by scraping it away or by pulling with tweezers Wash wound Cover with a sterile bandage Apply a cold pack
Spider/Scorpion Bite/Sting	Bite mark Swelling Pain Nausea and vomiting Difficulty breathing or swallowing	Wash wound Apply a cold pack Get medical care to receive antivenin Call local emergency number, if necessary
Venomous Snake Bite	Bite mark Pain	Wash wound Keep bite area still and lower than heart Call local emergency number
Animal Bite	Bite mark Pain Bleeding	If bleeding is minor—wash wound Control bleeding Apply antibiotic ointment and cover If bleeding is severe—get medical attention If you suspect the animal has rabies call local emergency number/animal control personnel

Hantavirus Information: The Hantavirus Pulmonary Syndrome illness is a respiratory disease that is a serious often deadly respiratory disease that has been found in rural areas of the western United States. It is also known as the Sin Nombre (No-Name) illness. Preliminary evidence has shown that the illness is caused by a Hantavirus that may be carried in the urine, saliva, and feces of rodents (particularly rats and mice). There is no current evidence to indicate that illness is

transmitted by biting insects (ticks, fleas, mosquitoes), or by person-to-person contact. Cats and dogs are not known to be a reservoir host of hantaviruses in the United States, however, these domestic animals may bring infected rodents into contact with humans.

It is a good idea for project personnel to be aware of the presence of any rodents and to take precautions where rodents may have been. These precautions include avoiding rodents, rodent bedding or nests, and rodent droppings. Notify the Site Supervisor if any signs of rodents are encountered.

Bats and rabies exposure. Rabies is a fatal viral disease transmitted to humans by the bite of infected bats. Bats may frequent abandoned mines and thus there is always the risk for contact with bats at some of the sites. Pertinent information from the Centers for Disease Control (CDC) on rabies transmission by bats, preventive measures, and procedures to follow if bitten by a bat are included in Appendix C. Employees must be familiar with this information. It should be reviewed during the initial safety briefing prior to conducting work in any known or suspected bat-infested areas.

4.8 Noise

Exposure to noise over the OSHA action level can cause temporary impairment of hearing; prolonged and repeated exposure can cause permanent damage to hearing. The risk and severity of hearing loss increases with the intensity and duration of exposure to noise. In addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of accidents on site.

4.8.6 Hearing Conservation

All personnel must wear hearing protection during the operation of noise producing machinery when noise levels exceed 85 dBA, or at the discretion of the SHSO. Noise monitoring is discussed in Section 8.0.

Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, wherever possible barriers or increased distance will be used to minimize worker exposure to noise.

4.9 Spill Control Plan

All personnel must take every necessary precaution to minimize the potential for spills during site operations. All on-site personnel are obligated to report immediately any discharge, no matter how small, to the Site Supervisor.

Spill control apparatus will be located on site at any locations that the Site Supervisor or SSSHO foresees the potential for discharge to the ground. All absorbent materials used for the clean up will be containerized and labeled separately from other wastes, unless otherwise directed by the contracting officer. In the event of a spill, the Site Supervisor will follow the provisions outlined in Section 11 to contain and control released materials and to prevent spread to off-site areas.

4.10 Lockout/Tagout Procedures

Maintenance procedures will only be performed by individual who are familiar with lockout/tagout procedures. Lockout is the placement of a device that uses a positive means such as a lock to hold an energy or material isolating device or system ensuring that the equipment cannot be operated until the lockout device is removed. If a device cannot be locked out, a tagout system will be used. Tagout is the placement of a warning tag on an energy or material isolating device indicating that the equipment controlled may not be operated until the tag is removed. Lockout/tagout procedures will be used during required repairs to the drill rig or other equipment that may cause injury in the event of accidental start-up.

4.11 Sanitation

Site sanitation will be maintained at each site according to OSHA, Department of Health requirements and US Army Corps of Engineers (USACE) applicable sanitation requirements outlined in EM-385-1-1, Section 2. Sanitation requirements will be determined by the SSHO for each site.

4.11.6 Break Area

Breaks will be taken in the support zone away from the active work area. There will be no smoking, eating, drinking, or chewing gum or tobacco in the exclusion zone.

4.11.7 Potable Water

The following rules apply for all project field operations:

An adequate supply of potable water will be provided at each work site

Portable containers used to dispense drinking water must be capable of being tightly closed, and must be equipped with a tap dispenser. Water must not be drunk directly from the container, nor dipped from the container

Containers used for drinking water must be clearly marked and not used for any other purpose

Disposable cups will be supplied; both a sanitary container for unused cups and a receptacle for disposing of used cups must be provided.

4.11.8 Sanitary Facilities

Access to facilities for washing before eating, drinking, or smoking will be provided.

4.11.9 Lavatory

If permanent toilet facilities are not available within a reasonable distance, an appropriate lavatory area will be provided.

4.11.10 Trash Collection

Trash collected from the exclusion and contamination reduction zone will be separated as routine hazardous waste. Trash collected in the support and break areas will be disposed of as non-hazardous waste. Labeled trash receptacles will be set up in the contamination reduction zones and in the support zone if deemed necessary by the SSHO.

4.12 Electrical Hazards

Electricity may pose a particular hazard to site workers due to the use of portable electrical equipment. If wiring or other electrical work is needed, a qualified electrician must perform it.

General electrical safety requirements include:

All electrical wiring and equipment must be a type listed by Underwriters Laboratories, Inc., (UL), Factory Mutual Engineering & Research (FM), or other recognized testing or listing agency.

All installations must comply with the National Electrical Safety Code, the National Electrical Code, or USCG regulations.

Portable and semi portable tools and equipment must be grounded by a multiconductor cord having an identified grounding conductor and a multicontact polarized plug-in receptacle.

Tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools must be distinctly marked and listed by UL or FM.

Live parts of wiring or equipment must be guarded to prevent persons or objects from touching them.

Electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.

All circuits must be protected from overload.

Temporary power lines, switch boxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage.

Plugs and receptacles must be kept out of water unless of an approved submersible construction.

All extension outlets must be equipped with GFCIs.

Attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment.

Extension cords or cables must not be fastened with staples, hung from nails, or suspended by bare wire.

Flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician.

4.13 Lifting Hazards

Using proper lifting techniques may prevent back strain or injury. The fundamentals of proper lifting include:

Consider the size, shape, and weight of the object to be lifted. Two persons must lift an object if it cannot be lifted safely alone (e.g., >60 pounds).

The hands and the object should be free of dirt or grease that could prevent a firm grip.

Gloves must be used, and the object inspected for metal slivers, jagged edges, burrs, rough or slippery surfaces.

Fingers must be kept away from points that could crush or pinch them, especially when putting an object down.

Feet must be placed far enough apart for balance. The footing should be solid and the intended pathway should be clear.

The load should be kept as low as possible, close to the body with the knees bent.

To lift the load, grip firmly and lift with the legs, keeping the back as straight as possible.

A worker should not carry a load that he or she cannot see around or over.

When putting an object down, the stance and position are identical to that for lifting; the legs are bent at the knees, and the back is straight as the object is lowered.

4.14 Dust Control

Activities likely to result in dust generation include mine waste/soil sample hole construction. Employees will wear dust masks when they are exposed to dust. In addition, field personnel will remain upwind of any intrusive or dust-creating activity.

4.15 Construction Equipment Safety Procedures

Only experienced, demonstrably proficient equipment operators will be used to operate the construction equipment. While operating equipment, the equipment operators will maintain communication with personnel on the ground through either direct voice contact or approved, standard hand signals. In addition, all site personnel in the immediate work area will be made aware of the equipment operations.

Motor vehicles and construction equipment present the potential for pinch and crush hazards. Personnel must remain in the line of sight of the equipment operators at all times. Heavy equipment will be equipped with a functioning back-up alarm or a spotter will be required when the vehicle is traveling in reverse.

All mechanical equipment will be inspected before the equipment is placed in service. All guards and safety devices for chain or belt drives will be in place when the equipment is in use. The front-end loader, motor grader, and track hoe will be inspected daily and the inspection will be documented by the site superintendent or designee. The individual conducting the inspection will look for frayed cables, leaking or abraded hoses, missing lock pins, and any other indications of unsafe or potentially unsafe conditions.

Underground and overhead utility lines can create hazardous conditions if they come in contact with excavation equipment. Appendix C provides an Underground/Overhead Utility Checklist that must be completed prior to any intrusive activities.

If excavations or trenches are to be developed, applicable provisions of EM-385-1-1 and 29 CFR1926 will be followed. Excavations less than five feet in depth do not require protective systems provided a competent person i.e. SSHO or Site Supervisor) determines that there is no potential for cave-ins.

4.16 Chemical Hazards

Except as described in section on mine waste/soil sample hole construction, no inhalation exposure hazard is anticipated for the duration of this project. Skin contact with potentially corrosive materials will be prevented by using suitable hand, eye and whole body PPE as described in section 5.0.

5. Personal Protective Equipment

PPE is required to safeguard site personnel from various hazards. Varying levels of protection may be required depending on the level of contaminants and the degree of physical hazard. This section presents the various levels of protection and defines the conditions of use for each level.

5.2 Levels of Protection

Protection levels are determined based upon contaminants present in the work area. A summary of the levels is presented in this section.

5.2.6 Protection for Reconnaissance, Water/Sediment Sampling, Vegetation/Geomorphic Survey Work

The minimum level of protection that will be required during these activities is described below:

Work clothing as prescribed by weather

Safety glasses or goggles, ANSI approved (if potential eye hazard is apparent)

5.2.7 Protection for Mine Waste and Soil Sampling Work

Site activities cause an increased potential for skin and/or eye contact with subsurface liquids and solids.

- Tyvek® coveralls
- Safety toe work boots
- Vinyl or latex booties, or polyvinyl chloride (PVC) overboots
- Safety glasses or goggles
- Hard hat
- Face shield (when projectiles pose a hazard)
- Latex gloves
- Hearing protection (if necessary)

Higher levels of protection are not anticipated for planned operations at any of the sites. If conditions warrant higher levels of protection, site work will be suspended until such conditions can be rectified or until this SSHP is amended to address such hazards. It is anticipated that respiratory protection will not be required for any site operations.

5.2.8 Selection of PPE

Equipment for personal protection will be selected by the SSHO for each task in consultation with the site supervisor and Health and Safety Coordinator (COE CIH) based on the potential for skin contact with potentially contaminated materials, site conditions, and ambient air quality. The anticipated PPE selection matrix for anticipated site tasks is given in the table below. This matrix is based upon information available at the time this plan was written. The level of protection may be upgraded or downgraded at the discretion of the SSHO and/or the CIH.

5.3 Using PPE

All people entering the exclusion zone must put on the required PPE in accordance with the requirements of this plan. When leaving the exclusion zone, PPE will be removed in accordance with the procedures listed, to minimize the spread of contamination. Employees will be provided with sunscreen with a minimum SPF 15 for all activities to cover exposed areas of skin.

6. Site Control

6.1 Hazard Briefing

No person will be allowed in the exclusion zone a during site operations without first being given a site hazard briefing. In general, the briefing will consist of a review of the Tailgate Safety Meeting. All people on the site, including visitors, must sign the site-specific tailgate safety meeting form. Tailgate Safety Meetings will be held at the beginning of each shift. The SSHO or site supervisor will conduct the tailgate meeting.

6.2 Field Activity Daily Log

The Field Activity Daily Log will be used for project documentation and record keeping.

6.3 Emergency Entry and Exit

People who must enter the site on an emergency basis will be briefed of the hazards by the Site Supervisor. All hazardous activities will cease in the event of an emergency and any sources of emissions will be controlled, if possible.

People exiting the site because of an emergency will gather in a safe area for a head count. The Site Supervisor is responsible for ensuring that all people who entered the exclusion zone area have exited in the event of an emergency.

7 Decontamination

7.1 Contamination Control Zones

Contamination control zones are maintained to prevent the spread of contamination and to prevent unauthorized people from entering hazardous areas.

7.1.1 Exclusion Zone

The exclusion zone consists of the specific work area, or can be the entire area of suspected contamination. All employees entering the exclusion zone must use the required PPE and will have the appropriate training for hazardous waste work. The exclusion zone is the defined area where there is a possible contact with a health hazard. The location of each exclusion zone will be identified by cones or other appropriate means.

7.1.2 Contamination Reduction Zone

The contamination reduction zone or transition area will be established if necessary to perform decontamination of personnel and equipment. All personnel entering or leaving the exclusion zone will pass through this area to prevent any cross-contamination and for accountability. Tools and any equipment or machinery will be decontaminated in a specific location. The decontamination of all personnel will be performed on site adjacent to the exclusion zone. Personal protective outer garments will be removed in the contamination reduction zone and will be cleaned or disposed of. This zone is the only appropriate corridor between the exclusion zone and the Support Zone.

7.1.3 Support Zone

The support zone is a clean area outside the contamination reduction zone located to prevent employee exposure to hazardous substances. Eating, drinking, or smoking will be permitted in the support area only after face and hands have been washed.

7.2 Posting

The exclusion zone, contamination reduction zone and support zone will be prominently marked and delineated using cones or yellow caution tape.

7.3 Decontamination General Rules

All personnel working in the exclusion zone must undergo personal decontamination prior to entering the support zone. The personnel decontamination area will consist of the following.

Personnel leaving the contaminated zone will remove the gross contamination from their outer clothing and boots or shoes

Personnel will remove their outer garment and gloves and deposit them in the lined waste receptacles. Personnel will wipe their hard hats, and boots with clean, damp cloths and then remove those items.

Personnel will thoroughly wash their hands and face before leaving the contamination reduction zone.

7.4 Equipment Decontamination

All vehicles that have entered the contaminated zone will be decontaminated prior to leaving the zone. If the level of vehicle contamination is low, decontamination may be limited to rinsing of tires and wheel wells with water. If the vehicle is significantly contaminated, steam cleaning or pressure washing of vehicles and equipment may be required.

7.5 Personal Protective Equipment Decontamination

Field drilling and sampling activities will be conducted in Level D or modified Level D PPE.

This protective clothing will be disposed of as solid waste, unless otherwise determined as highly contaminated through the subsequent analysis of collected soil samples.

8 Employee Training

8.1 Site-Specific Training

Site-specific training will be accomplished through a review of this SSHP before work begins. All workers will review and sign the SSHP acknowledgment form. In addition, the daily Tailgate Safety Meetings will cover the work to be accomplished, the hazards anticipated, the protective clothing and procedures required to minimize site hazards, and emergency procedures. No work will be performed before the Tailgate Safety Meeting has been held and workers have signed the form.

8.2 First Aid and CPR

At least one preferably two employees current in first aid/CPR will be assigned to the work crew and will be on the site whenever operations are ongoing. Refresher training in first aid (triennially) and CPR (annually) is required to keep the certificate current. As a minimum, rubber gloves should be available for use by trained first-aiders for use when exposure to blood or other body fluids is a concern.

9 Medical Surveillance

9.1 First Aid and Medical Treatment

All persons on site must report any near-miss incident, accident, injury, or illness to their immediate supervisor or the Site Supervisor. A trained site first aid provider will provide first aid. Injuries and illnesses requiring medical treatment must be documented. The Site Supervisor must conduct an accident investigation as soon as emergency conditions no longer exist and first aid and/or medical treatment have been completed. All necessary reports must be completed and submitted to the HSM within 24 hours after the incident.

If first-aid treatment is required, first aid kits will be kept at the contamination reduction or support zones. If treatment beyond first aid is required, the injured should be transported to the medical facility. If the injured is not ambulatory, or shows any sign of not being in a comfortable and stable condition for transport, then an ambulance/paramedics should be summoned. If there is any doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

9.2 Medical Restriction

If a physician identifies a need to restrict work activity, the employee's supervisor must communicate the restriction to the employee, and the Site Supervisor. The terms of the restriction will be discussed with the employee and this supervisor. Every attempt should be made to keep the employee working, while not violating the terms of the medical restriction.

10 Emergency Procedures

10.1 General

The Site Supervisor will establish evacuation routes and assembly areas for each site. All personnel entering the site will be informed of these routes and assembly areas. If the site is large and the evacuation routes not clear, a site plan will be made marking the evacuation routes and will be posted at conspicuous locations.

Each site will be evaluated for the potential for fire, explosion, chemical release, or other catastrophic events. Unusual events, activities, chemicals, and conditions will be reported to the Site Supervisor immediately.

10.2 Emergency Response

If an incident occurs, the following procedures will be used:

The Site Supervisor will evaluate the incident and assess the need for assistance

The Site Supervisor will call for outside assistance as needed

The Site Supervisor will act as liaison between outside agencies and on-site personnel

The Site Supervisor will ensure the Delivery Order Manager and SHSO are notified promptly of the incident

The Site Supervisor will take appropriate measures to stabilize the incident scene.

10.2.1 Fire

In the case of a fire on the site, the Site Supervisor will assess the situation and direct fire-fighting activities. The Site Supervisor will ensure that the client site representative (as appropriate) is immediately notified of any fires. Site personnel will attempt to extinguish the fire with available extinguishers, if safe to do so. In the event of a fire that site personnel are unable to safely extinguish, the local fire department will be summoned via 911 or other number. The Site Supervisor will notify the fire department after-the-fact regarding fires successfully extinguished.

10.2.2 Spill

If a spill occurs, the following procedures will be followed:

Notify Site Supervisor immediately.

Evacuate immediate area of spill.

If a small spill, don chemical resistant gloves absorb or otherwise clean up the spill and containerize the material, absorbent, and affected soils. In case of a large spill call 911.

The Site Supervisor has the authority to commit resources as needed to contain and control released material and to prevent its spread to off-site areas.

10.3 Safety Signals

Vehicle or portable air horns will be used for safety signals as follows:

- One long blast: Emergency evacuation of the site
- Two short blasts: Clear working area around powered or moving equipment.

10.4 Medical Emergency

All employee injuries must be promptly reported to the Site Supervisor. The Site Supervisor will:

Ensure that the injured employee receives prompt first aid and medical attention

Ensure that the Project Manager and Delivery Order Manager are promptly notified of the incident

Initiate an investigation of the incident.

10.4.1 First Aid—General

Survey the scene. Determine if it is safe to proceed. Protect yourself from exposure before attempting to rescue the victim.

Do a primary survey of the victim. Check for **airway** obstruction, **breathlessness**, and **pulse**. Assess likely routes of chemical exposure by examining the eyes, mouth, nose, and skin of the victim for symptoms.

Phone Emergency Medical Services (EMS). Give the location, telephone number used, caller's name, what happened, number of victims, victims' condition, and help being given.

Perform rescue breathing as necessary.

Perform CPR as necessary.

Do a secondary survey of the victim. Check **vital signs** and do a **head-to-toe exam**.

Treat other conditions as necessary. If the victim can be moved, take him to a location away from the work area where EMS can gain access.

10.4.2 First Aid—Inhalation

Any employee complaining of symptoms of chemical overexposure as described in Section 3.0 will be removed from the work area and transported to the designated medical facility for examination and treatment.

10.4.3 First Aid—Ingestion

Call EMS and consult a poison control center for advice. If available, refer to the MSDS for information on inducing vomiting, if recommended. If unconscious keep the victim on his side and clear the airway if vomiting occurs.

10.4.4 First Aid—Skin Contact

Project personnel who have had skin contact with contaminants will, unless the contact is severe, proceed through the contamination reduction zone, to the wash-up area. Personnel will remove any contaminated clothing, and then wash the affected area with water for at least 15 minutes. The worker should be transported to the medical facility listed below, if they show any sign of skin reddening, irritation, or if they request a medical examination.

10.4.5 First Aid—Eye Contact

Project personnel who have had contaminants splashed in their eyes or who have experienced eye irritation while in the exclusion zone, must immediately proceed to the eyewash station, set-up in the contamination reduction or support zone. Do not decontaminate prior to using the eyewash. Remove whatever protective clothing is necessary to use the eyewash. Flush the eye with clean running water for at least 15 minutes. Arrange prompt transport to the designated medical facility.

10.5 *Reporting Injuries and Illnesses*

All injuries and illnesses, however minor, will be reported to the Site Supervisor immediately. The Site Supervisor will complete an injury report and submit it to the SHSO within 24 hours. In the event of any accident, injury or suspected occupational illness, the reporting procedures outlined in AR-385-40, AR-385-40 (USACE Supplement) and ER-385-1-92 will be followed. The appropriate form(s) including ENG 3394 will be completed and forwarded to the Albuquerque and/or Omaha Safety and Occupational Health Offices.

10.6 *Emergency Information*

Local public response agencies will be reviewed in the Tailgate Safety Meeting. (See table of emergency information on next page.)

Appendix A
Material Safety Data Sheets

NOT USED

Appendix B
Eng 3394 (USACE Accident Reporting Form)

Appendix C

Information on Bats and Rabies

The following information was taken from the Center for Disease Control (CDC) Web page:<http://www.cdc.gov>

What is rabies and how do people get it?

Rabies is an infectious viral disease that affects the nervous system of humans and other mammals. People get rabies from the bite of an animal with rabies (a rabid animal). Any wild mammal, like a raccoon, skunk, fox, coyote, or bat, can have rabies and transmit it to people. It is also possible, but quite rare, that people may get rabies if infectious material from a rabid animal, such as saliva, gets directly into their eyes, nose, mouth, or a wound.

Because rabies is a fatal disease, the goal of public health is, first, to prevent human exposure to rabies by education and, second, to prevent the disease by anti-rabies treatment if exposure occurs. Tens of thousands of people are successfully treated each year after being bitten by an animal that may have rabies. A few people die of rabies each year in the United States, usually because they do not recognize the risk of rabies from the bite of a wild animal and do not seek medical advice.

Why should I learn about bats and rabies?

Most of the recent human rabies cases in the United States have been caused by rabies virus from bats. Awareness of the facts about bats and rabies can help people protect themselves, their families, and their pets. This information may also help clear up misunderstandings about bats. When people think about bats, they often imagine things that are not true. Bats are not blind. They are neither rodents nor birds. They will not suck your blood -- and most do not have rabies. Bats play key roles in ecosystems around the globe, from rain forests to deserts, especially by eating insects, including agricultural pests. The best protection we can offer these unique mammals is to learn more about their habits and recognize the value of living safely with them.

How can I tell if a bat has rabies?

Rabies can be confirmed only in a laboratory. However, any bat that is active by day, is found in a place where bats are not usually seen (for example, in a room in your home or on the lawn), or is unable to fly, is far more likely than others to be rabid. Such bats are often the most easily approached. Therefore, it is best never to handle any bat.

What should I do if I come in contact with a bat?

If you are bitten by a bat -- or if infectious material (such as saliva) from a bat gets into your eyes, nose, mouth, or a wound -- wash the affected area thoroughly and get medical advice immediately. Whenever possible, the bat should be captured and sent to a laboratory for rabies testing (see: How can I safely capture a bat in my home?).

People usually know when they have been bitten by a bat. However, because bats have small teeth which may leave marks that are not easily seen, there are situations in which you should seek medical advice even in the absence of an obvious bite wound. For example, if you awaken and find a bat in your room, see a bat in the room of an unattended child, or see a bat near a mentally impaired or intoxicated person, seek medical advice and have the bat tested. People cannot get rabies just from seeing a bat in an attic, in a cave, or at a distance. In addition, people cannot get rabies from having contact with bat guano (feces), blood, or urine, or from touching a bat on its fur (even though bats should never be handled!).

How can rabies be prevented?

- Teach children never to handle unfamiliar animals, wild or domestic, even if they appear friendly. \forall Love your own, leave other animals alone \forall is a good principle for children to learn.
- Wash any wound from an animal thoroughly with soap and water and seek medical attention immediately.
- Have all dead, sick, or easily captured bats tested for rabies if exposure to people or pets occurs.
- Prevent bats from entering living quarters or occupied spaces in homes, churches, schools, and other similar areas where they might contact people and pets.
- Be a responsible pet owner by keeping vaccinations current for all dogs, cats, and ferrets, keeping your cats and ferrets inside and your dogs under direct supervision, calling animal control to remove stray animals from your neighborhood, and consider having your pets spayed or neutered.

Case study

In February 1995, the aunt of a 4-year-old girl was awakened by the sounds of a bat in the room where the child was sleeping. The child did not wake up until the bat was captured, killed, and discarded. The girl reported no bite, and no evidence of a bite wound was found when she was examined. One month later the child became sick and died of rabies. The dead bat was recovered from the yard and tested--it had rabies.

This case demonstrates several points:

- This child's infection with rabies was most likely the result of a bat bite. Children sleep heavily and may not awaken from the presence of a small bat. A bat bite can be

superficial and not easily noticed.

- The bat was behaving abnormally. Instead of hiding, the bat was making unusual noises and was having difficulty flying. This strange behavior should have led to a strong suspicion of rabies.
- If the bat had been submitted for rabies testing, a positive test would have led to life-saving anti-rabies treatment.

Remember, in situations in which a bat is physically present and you cannot reasonably rule out having been bitten, safely capture the bat for rabies testing and seek medical attention immediately.

Where can I learn more about bats?

Contact your state or local wildlife conservation agency or Bat Conservation International:

Bat Conservation International, Inc.

P O Box 162603

Austin, Texas 78716

www.batcon.org

To learn more about endangered bats and the Endangered Species Act, contact the US Fish and Wildlife Service:

U S Fish and Wildlife Service

Division of Endangered Species

4401 N. Fairfax Drive, Room 452

Arlington, Virginia 22203

www.fws.gov

Where can I learn more about rabies?

Contact your state or local health department or the Centers for Disease Control and Prevention:

Centers for Disease Control and Prevention

National Center for Infectious Diseases

Rabies Section MS G-33

1600 Clifton Road

Atlanta, Georgia 30333

www.cdc.gov/ncidod/dvrd/rabies

Tailgate Safety Meeting Documentation

Topic(s):

SSHP review

Date _____

Presenter _____

Name	Organization

Tailgate Safety Meeting Documentation

Topic(s)

Date _____

Presenter _____

Name	Organization

Tailgate Safety Meeting Documentation

Topic(s):

SSHP review

Date _____

Presenter _____

Name	Organization

Tailgate Safety Meeting Documentation

Topic(s)

Date _____

Presenter _____

Name	Organization