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# Ruby Mines Phase 1 Work Plan Adit and Vent Closure

Prepared for  
**Western Nuclear, Inc.**

August 2013

**CH2MHILL®**

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# Acronyms and Abbreviations

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AOC	Administrative Order on Consent
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
GPS	Global positioning system
HMOSP	Historic Mine-Openings Safety Program
HMOSPT	Historic Mine-Openings Safety Program Team
MMD	New Mexico Energy, Minerals and Natural Resources Department, Mining and Mineral Division
NMCRIS	New Mexico Cultural Resources Information System
PUF	Polyurethane foam
USEPA	United States Environmental Protection Agency
WNI	Western Nuclear Inc.

SECTION 1

# Introduction

This Work Plan describes activities to maintain temporary fencing placed around two adits and two vent holes, close adits and vent holes, and post warning signs at the former Ruby Mines Site consistent with Phase 1 of the Scope of Work contained in Appendix A of the United States Environmental Protection Agency (USEPA) Administrative Settlement Agreement and Order on Consent (July 15, 2013) (ASAOC). This is the first of three phases of work for the Ruby Mines Site removal site evaluation and interim removal action. Note that historical mine planning documents for the Ruby Mines refer to the adits as portals and associated declines that were used to access the underground mines.

## 1.1 Background and Site Description

The Ruby Mines Site (Site) consists of four former underground uranium mines (Ruby Mines Nos. 1, 2, 3, and 4) located in McKinley County, New Mexico near Smith Lake approximately eight miles north of Thoreau in western New Mexico. Figure 1 shows the locations of the Ruby Nos. 1 and 3 mine adits; Ruby Nos. 2 and 4 Mines were located between the Ruby Mines Nos. 1 and 3. The Ruby Mines Nos. 1 through 4 (Ruby Mines) are located on the Navajo Nation in Township 15 North, Range 13 West, Sections 21, 27, 25, and 26, respectively (New Mexico Energy, Minerals and Natural Resources Department, Mining and Mineral Division (MMD), 1995). Note that historical mine planning documents refer to the Ruby Mines Nos. 1 through 4 based on the section where they are located (e.g., Ruby Mine No. 1 is referred to as the Section 21 mine). The Ruby Mines Nos. 2 and 4 were entirely located underground and were accessed via the underground workings of Ruby Mines Nos. 1 and 3. Ruby Mines Nos. 1 and 3 each had a portal and decline which provided access to the underground workings; they also had mine plant facilities at surface (e.g., warehouse, change house, office, and compressor shed).

The adit at the former Ruby No. 1 Mine is located at Lat/Long: 35.5194714259 N / -108.22297769 W (Weston, 2009a). The adit at the former Ruby No. 3 Mine is located at Lat/Long: 35.5078555468 N / -108.162354984 W (Weston, 2009b). During a site reconnaissance visit in October 2012, an opening was observed at the Ruby Mine No. 1 adit and two vents were found near Ruby Mine No 1. One of the vents was backfilled to the surface and did not pose a safety issue. The other vent, designated RUBY-002-A, was not filled to the surface. Temporary fencing was placed around the vent and adit to control access. A depression filled with trash was also found which residents indicated might be a former vent but no surface opening was present. During a March 2013 site visit to inspect temporary fencing placed around the Ruby Mine No. 1 adit and vent RUBY-002-A, another vent, designated RUBY-004-A, was located approximately 1.6 miles southeast of Ruby Mine No. 1. Based on the similarities of estimated coordinates, this vent appears to be vent hole #8, one of the eight vent holes associated with Ruby Mines Nos. 2, 3, and 4 . Temporary fencing has also been placed around this vent. Because it is located in Section 27 it is probably associated with the Ruby Mine No. 2. Figure 2 shows the locations of the two adits and three vents that have been located to date, as well as the estimated locations of the seven vents that potentially exist but have not been physically located. Coordinates for the known and suspected vents are shown on Table 1. The first five features listed on Table 1 have been physically located. The locations of vents # 1 through 7 shown on Table 1 have been estimated from mine planning documents.

TABLE 1  
**Adit and Vent Coordinates**  
*Ruby Mines Phase 1 Work Plan Adit and Vent Closure*

NAME	X_COORD	Y_COORD
Ruby Mine No. 1 Adit (RUBY-001-A) <sup>1</sup>	-108.22297769	35.5194714259
Ruby Mine No. 3 Adit (RUBY-003-A)	-108.16235498	35.5078555468
Ruby Mine Vent (RUBY-002-A)	-108.22513273	35.5150262320
Ruby Mine Vent (RUBY-004-A)/ Vent Hole #8	-108.20545600	35.50684700

TABLE 1  
**Adit and Vent Coordinates**  
*Ruby Mines Phase 1 Work Plan Adit and Vent Closure*

NAME	X_COORD	Y_COORD
Ruby Mine Vent (closed)	-108.222527772	35.512469656
Vent Hole #1	-108.16739909	35.50244690
Vent Hole #2	-108.16929306	35.50276655
Vent Hole #3	-108.17192615	35.50310501
Vent Hole #4	-108.18416767	35.50274775
Vent Hole #6	-108.18523014	35.50391354
Vent Hole #5	-108.18458342	35.50457163
Vent Hole #7	-108.20472420	35.50759882

<sup>1</sup> "RUBY-00X-A" is a unique location identifier assigned by the Freeport-McMoRan Historic Mine-Openings Safety Program (HMOSP) when they placed temporary fencing around the two adits and two vent holes.

## 1.2 Mining and Reclamation History

Mineral rights were first leased to Western Nuclear Inc. (WNI) for the Ruby Mine No. 1 in 1972 from the New Mexico and Arizona Land Company. In 1974, WNI entered into a joint operating agreement with the New Mexico and Arizona Land Company to develop and mine the property. A summary of mining operation timeline is presented in Table 2.

TABLE 2  
**Ruby Mine Site Operation Dates**  
*Work Plan Ruby Mines Phase 1 Work Plan Adit and Vent Closure*

Location	Mining Started	Mining Ended	Reclaimed
Ruby No. 1 Mine (Section 21)1	September 1975	September 1981	October 1985
Ruby No. 2 Mine (Section 27)	April 1979	November 1981	October 1985
Ruby No. 3 Mine (Section 25)	December 1980	February 1985	October 1985
Ruby No. 4 Mine (Section 26)	May 1982	February 1985	October 1985

1, Note that historical documents for the Ruby Mines sometimes refer to them based on the section where they are located (e.g., the Ruby No. 1 Mine is referred to as the Section 21 mine).

All four mines were mined by underground methods. Ores from Ruby Mines Nos. 2 and 4 were transported through the underground workings of the Ruby Mines Nos. 1 and 3, respectively, and then to the surface via the declines and portals at the Ruby Mines Nos. 1 and 3. There was no surface disturbance at Ruby Mines Nos. 2 and 4 other than vent holes. No milling took place at the site.

Reclamation efforts by WNI at the Ruby Mines were performed between June and December of 1985 and approved by the U.S. Department of Interior Bureau of Land Management (1991) and U.S. Department of Interior Bureau of Indian Affairs (1996). Based on an EPA Potential Hazardous Waste Inspection performed on August 13, 1986, the State of New Mexico Environmental Improvement Division recommended no further CERCLA action at Ruby Mine No.1 (State of New Mexico Environmental Improvement Division 1986). As part of mine reclamation efforts, Ruby Mine No. 1 adit was sealed with a concrete wall and backfilled, and the Ruby Mine No. 3 adit was closed and covered (MMD, 1995). Mine waste at Ruby Mine No. 1 was covered by a minimum of 10 feet of compacted fill to satisfy Nuclear Regulatory Commission (NRC) requirements. Mine waste at Ruby Mine No. 3 was

covered with a minimum of 12 inches of compacted fill. Vents were reportedly plugged and sealed with concrete to within two feet of the ground surface and then backfilled with soil. Buildings associated with the surface operations as Ruby Mines Nos. 1 and 3 were removed with the exception of the shop building at Ruby Mine No. 1, which was left at the request of the Navajo Nation and sold to a resident. Power lines were turned over to and salvaged by the Navajo Power Company in 1987 (MMD, 1995). Water systems were turned over to the Navajo Water Company. In 1993, erosion of the mine waste cover at Ruby Mine No. 1 was repaired. A drainage diversion around the Ruby Mine No. 3 was incised into bedrock to prevent erosion of the mine waste pile and cover.

Reconnaissance of the Ruby Mines in October 2012 revealed a portion of the Ruby Mine No. 1 adit had collapsed creating an opening and the location of two vent holes near the former Ruby Mine No. 1. One of the vents was filled to the surface; the other was open at the surface and had a fence in need of repair. Temporary fencing was placed around the adit opening and the existing fence around the vent was repaired in October 2012. In addition, warning signs were posted around each feature. WNI inspected the temporary fencing and warning signs in March 2013. The inspection found that the fences were intact and signs were in place. The inspection also found that the adit at the Ruby Mine No. 3 had collapsed creating an opening approximately 3 feet in diameter and 15 feet deep. Another vent was found in a southeast direction from the former Ruby Mine No. 1 which has been determined to be vent hole #8. This vent was open at the surface; the opening is approximately 6 feet in diameter and 15-25 feet deep. Temporary fencing and warning signs were placed around the opening at the Ruby Mine No. 3 mine adit and the newly discovered vent in March 2013. Temporary fencing will continue to be inspected and maintained until closure is complete. Fence inspection reports are contained in Appendix A.

## SECTION 2

# Scope of Work

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Ruby Mines surface features addressed in this Work Plan include the two adits at the former Ruby Mines Nos. 1 and 3 and the vent holes associated with the four mines. The ASAOC Scope of Work specifies that under Phase 1 these features are to be closed in an appropriate manner and bilingual signs in English and Navajo warning of potential hazards be posted in the four cardinal directions at Ruby Mines Nos. 1 and 3. Specific tasks for Phase 1 include:

- Task 1 – reconnaissance to locate additional vents
- Task 2 – preparation for mine feature closure
- Task 3 – mine feature closure and posting bilingual warning signs
- Task 4 – adit and vent closure documentation
- Task 5 – post closure monitoring and maintenance

The above tasks will be performed by the Freeport-McMoRan, Historic Mine-Openings Safety Program (HMOSP) team, CH2M HILL and their subconsultants as shown in Figure 3. The Freeport-McMoRan HMOSP team will locate additional vents; evaluate whether they require closure and, if so, by what method; and close the vents and adits. They will also identify and meet the requirements of applicable regulations, contract with appropriate wildlife specialists, document closure activities, and perform maintenance if needed. CH2M HILL will provide oversight, contract with a qualified company to perform the cultural resources survey, and prepare a report documenting closure activities.

## 2.1 Task 1 – Reconnaissance to Locate Additional Vents

In addition to the openings at the two adits and three vents previously located, reconnaissance will be performed to locate the other vents associated with the Ruby Mines (Figure 2). As was discussed above, reportedly there were eight vent holes associated with Ruby Mines 2, 3, and 4. One of those vent holes was located and fenced in March 2013. Areas in the vicinity of seven remaining vents shown in mine planning documents will be searched on foot to determine whether they exist and if so their current condition. The vents will be identified and documented using a Mesa field unit, which allows data to be captured electronically:

- Sites will be given an identification number
- Site information will be recorded using Mesa units
- Pictures will be taken of each site
- GPS (Global Positioning System) coordinates will be documented
- If needed, appropriate closure methods will be identified

If additional vents are found, proposed closure methods will be documented in an addendum to this Work Plan, including site preparation activities, closure material type and quantity, and phasing. The addendum will be submitted to EPA for approval prior to implementing closure activities. Proposed closure methods will be based on information regarding biological and cultural resources obtained during Task 2.

## 2.2 Task 2 – Preparation for Mine Feature Closures

Before mine closure is initiated four tasks will need to be completed to address potential wildlife protection; identify applicable state, federal, and Navajo regulations; document cultural resources present on and near the mine sites; and implement Health and Safety Plans. This will be done for all vents and adits located during past reconnaissance and those discovered during execution of Task 1.

### 2.2.1 Wildlife Protection

A special status species screening evaluation of the Ruby Mines vicinity will be performed to identify which special status species have the potential to occur in the area where the features are located. The Special Status Species

Screening Evaluation is used by HMOSP to identify special status species so they may be avoided during work activities.

If bats or other wildlife are known or determined likely to be present and potentially use the openings as habitat, the mine closure design will be modified to minimize impacts, as discussed in Section 3 of this Work Plan. The evaluation includes those species that are listed as threatened, endangered, and proposed candidates by the US Fish and Wildlife Service. It also addresses an extensive list of bat species found under the International Union for Conservation of Nature Red List of Threatened Species and the NatureServe conservation ranking (<http://www.natureserve.org/>). Conservation Biologist Jason Corbett Subterranean Program Coordinator of Bat Conservation International, (<http://batcon.org/>) will perform the site wide special status species screening evaluation.

## 2.2.2 Environmental Compliance

Applicable environmental regulations applicable to the Ruby Mines closure will be researched and followed. These include state, US federal, and Navajo Nation requirements. Potential environmental concerns associated with each mine feature will be identified such as identification of surface water features and waters of the US protected under the Clean Water Act. If more than one (1) acre will be disturbed using large equipment during closure activities, appropriate stormwater runoff controls and dust mitigation controls will be implemented.

## 2.2.3 Cultural Resource Assessment

A cultural resource survey will be performed that will not only include adits and vents to be closed during Phase 1, but also the capped areas plus step out, haul roads, drainages, representative exploration holes, and background areas. For adits and vents, a 50 by 50 foot area centered on each adit and open vent will be surveyed. The capped mine waste piles and the mine plant area will be surveyed including a 15 meter step out area around these features. Drainages and haul roads will also be surveyed including 15 meters from the center line of these features. For unusually wide roads and drainages the survey distance from the center line will be extended. Cultural resource assessments will also be performed at two background areas each approximately 2 acres in size that are geologically similar to and located upwind and upgradient of the Ruby Mine No. 1 and No. 3 adits. Finally, assessments will be conducted around selected exploration holes that will be assessed during Phase 2.

The Cultural Resource Assessment will include an archival literature search and interviews with local residents, workers, and Smith Lake Chapter staff, as well as a field survey. The Class I literature search will be conducted using archives of the New Mexico Historic Preservation Division and the New Mexico Cultural Resources Information System (NMCRIS) database in order to capture previous survey data and previously recorded resources within 1.0 mile of the mine sites. Existing information will be used to assess the existing known conditions regarding type, density, and distribution of known cultural resources, the nature and extent of previous cultural resources studies, and the present applicability of results and recommendations of these previous investigations within the study areas. The cultural resources investigation will meet the federal standards for Section 106 compliance of the National Historic Preservation Act (36CFR800).

The field survey will involve a crew of qualified archaeologists walking parallel transects, spaced at a maximum of 15-meter intervals. The Class III intensive cultural resources survey will be conducted to identify prehistoric and historic cultural resources. Cultural resources, including previously identified and new sites and Isolated Occurrences located during the inventory will be recorded on appropriate forms, mapped using GPS, and photographed.

Following completion of the survey, an evaluation of National Register of Historic Places and NMCRIS eligibility will be conducted for each cultural resource identified.

## 2.2.4 Health and Safety

All work on the Site will be conducted in accordance with a Health and Safety Plan that identifies and outlines all necessary safety precautions and nearby facilities and resources. The Health and Safety Plan for the HMOSP is contained in Attachment B. The Health and Safety Plan for CH2M HILL's oversight activities is contained in Attachment C.



## 2.3 Task 3 - Mine Feature Closure

Closure work will be completed on each adit and, as needed, on the vents to reduce safety risks. Appropriate methods will be selected based on site conditions and regulatory requirements. A reconnaissance to locate additional vents will be performed prior to closure activities. If additional vents are located, an addendum to this Work Plan providing specific closure activities for each of the additional vents will be prepared if needed.

### 2.3.1 Environmental and Wildlife

The special status species screening evaluation performed in Task 1 will be used to ensure that either there are no special status species in the vicinity of the mine openings at the time of closure or that appropriate methods are used to mitigate impacts. All mobilization and demobilization activities will be conducted in a manner to minimize disturbance of the environment. All disposable material brought onsite will be used and/or removed from the area and properly disposed of.

Fugitive dust will be controlled in the following manner: 1) Limit the vehicle speed in order to control the dust generated; 2) Keep a log of the water usage (gallons) when using a Water Wagon for dust control; and 3) An EPA Reference Method 9 trained employee(s) will occasionally spot-check activity for opacity.

Before leaving the site the HMOSP team will conduct a visual inspection of the area for solid waste and spills of petroleum products.

### 2.3.2 Material Transportation

This section discusses general adit and vent closure methods. Specific closure methods for the two adits and two vents that were located and fenced during prior site visits are discussed in Section 2.4; no further closure activities are required at the second Ruby No. 1 mine vent as it is filled to the surface. Specific closure methods for the additional vents will be determined after they have been located and inspected. A Work Plan addendum will be submitted to EPA for approval.

Closure materials will be transported to the mine features by truck, utility vehicle, and/or backpack. In cases where mine features are located in very remote locations and it is not possible or feasible to transport materials using these methods, skyboxes or helicopter drops may be used.

#### Mine Closure Method

The closure type selected for a mine feature is dependent on the characteristics of each individual mine feature. Typical closure methods used by the HMOSP team are described below.

#### Backfill:

Suitable sources of borrow material for backfilling will be identified for each feature to be closed. Backfilling generally consists of native material that is placed in the mine feature using manual labor or small excavation equipment. Outside material may be brought onsite for backfill, when suitable material is not available onsite. Backfilling may be accompanied by selective regrading to address unstable slopes, and improve surface water drainage control as needed.

#### Polyurethane Foam (PUF) Plug:

A PUF plug consists of foam material that is poured over a bulkhead to create a plug. The surface of the PUF is then backfilled with native material, to protect the polyurethane foam (PUF) from ultraviolet light. The depth of the plug is determined by state regulations. If no state regulations are in place, the HMOSP team will follow the manufacturer's recommendations so that the depth of the PUF plug installed on a vent hole is no less than the smallest diameter of the feature and the depth of a PUF plug installed on an adit is 4 ft.

#### Properties of PUF:

- Available in barrel sets or in boxes
- The boxed foam is portable (Boxes weigh 76 lbs. each)
- Inert

- Permanent positive seal
- 50 times lighter than concrete
- Sensitive to ultraviolet light

**Installation of PUF:**

- Two part self-contained system that is mixed
- Heats up to 152 °F
- Installed in layers
- Expands 30:1

**PUF Plug with Batgate:**

This method consists of a standard PUF plug that also includes a 24" diameter or greater HDPE pipe with rebar spaced 5 ¾" to allow ingress and egress to bats.

**2.3.3 PUF Plug with Vent Pipe:**

This method consists of a standard PUF plug that also includes 4"-8" PVC pipe. This method is used when a mine feature contains water or is discharging water to allow pressure change and reduce disturbance of water flow.

**2.3.4 Warning Signs**

Bilingual (English and Navajo) warning signs will be installed in each of the cardinal directions at Ruby Mines Nos. 1 and 3. An example of a warning sign is contained in Appendix D.

**2.4 Site Specific Work Procedures**

Specific proposed closure methods for the Ruby Mine Nos. 1 and 3 adits and two previously fenced vents are described below. These closure methods are based on a site-specific evaluation of each feature by the HMOSP team.

**2.4.1 Ruby Mine No. 1 Shaft (RUBY-001-A)**

This adit is approximately 16' x 20' wide and 20'+ deep and will be closed using a combination of backfill and a PUF plug with a batgate. The temporary fence will be removed and a backhoe will be used to stabilize the area above the adit as well as remove material covering an undercut portion of the shaft. The removed material will be placed in the shaft. A geotextile fabric bulkhead with a 24" HDPE pipe batgate (with #10 rebar spaced 5 ¾") will then be constructed and suspended at a depth of approximately 20' in the shaft. Approximately 16 CY of PUF will then be poured in 6" lifts, to allow the material to expand and set. Once the PUF reaches approximately 3' from the surface and has set, the remaining open area will be backfilled using approximately 54 CY of clean fill material. Given the estimated volume of backfill that may be required, it will be transported to the site from an outside source. A 2K water truck will be used as needed to minimize dust during closure work.

The photo below shows the condition of the mine feature on October 23, 2012, after the construction of the temporary fence:

**Temporary Fence Closure Photo of RUBY-001-A****2.4.2 Ruby Mine Vent (RUBY-002-A)**

This vent will be closed using a polyurethane foam (PUF) plug with a vent pipe. This feature is approximately 10' x 12' at the collar and gradually decreases in size to a 6' x 6' shaft that contains the bottom of a metal tank. The temporary fence and, if possible, metal tank will be removed prior to closure work. In October 2012, the tank contained water approximately 3' below the surface. If water is present at the time of closure, a water pump will be used to remove the water from the shaft, to decrease the water level to approximately 10' below the surface. Once the water level has reached an acceptable level, a geofabric bulk head with a 6" PVC vent pipe will then be constructed and suspended at a depth of approximately 9' in the shaft. Approximately 22 CY of PUF will then be poured in 6" lifts, to allow the material to expand and set. Once the PUF reaches approximately 3' from the surface and has set, the remaining 3' will be manually backfilled using native material.

The following photo shows the condition of the mine feature on October 23, 2012, after the construction of the temporary fence:



**Temporary Fence Closure Photo of RUBY-002-A****2.4.3 Ruby Mine No. 3 Adit (RUBY-003-A)**

This adit will be closed using a polyurethane foam (PUF) plug with a batgate. This feature has a 3' x 3' foot opening that increases to an 8' x 8' opening approximately 12" below the surface. The temporary fence will be removed prior to closure work. A portion of the 3' x 3' collar will be collapsed as needed to allow sufficient access to install the batgate. A geofabric bulk head with a 24" HDPE pipe batgate (with #10 rebar spaced 5 3/4") will then be constructed and suspended at a depth of approximately 11' in the shaft. Approximately 19 CY of PUF will then be poured in 6" lifts, to allow the material to expand and set. Once the PUF reaches approximately 3' from the surface and has set, the remaining 3' will be manually backfilled using native material.

The following photo shows the condition of the mine feature on April 9, 2013, after the construction of the temporary fence:

**Temporary Fence Closure Photo of RUBY-003-A****2.4.4 Ruby Mine Vent (RUBY-004-A)**

This vent will be closed using a polyurethane foam (PUF) plug. This feature is approximately 6' x 6' with a corrugated metal lining. The temporary fence will be removed prior to closure work. A geofabric bulk head will be constructed and suspended at a depth of approximately 9' in the shaft. Approximately 8 CY of PUF will then be poured in 6" lifts, to allow the material to expand and set. Once the PUF reaches approximately 3' from the surface and has set, the remaining 3' will be manually backfilled using native material.

The following photo shows the condition of the mine feature on April 9, 2013, after the construction of the temporary fence:



**Temporary Fence Closure Photo of RUBY-004-A**

## 2.5 Task 4 – Documentation

A mine closure report will be submitted which summarizes the closure work performed. The closure report will provide a description of any additional vents that are discovered during site reconnaissance. Closure activities performed at each mine feature will be documented including:

- identification number
- description
- photographs
- GPS coordinates
- closure methods used and features to protect wildlife and cultural resources.

The closure report will also include as attachments the wildlife survey report and cultural resource report. These will document the procedures used in conducting the surveys, results of archival literature reviews, results of the fieldwork, forms, site drawings, maps and photographs, and recommendations for any additional surveys, as appropriate.

## 2.6 Task 5 – Monitoring and Maintenance Work

The HMOSP team conducts annual inspections of all completed closure work, to ensure the closure has not been compromised by weather conditions or trespassers. If a closure is found to be damaged, the HMOSP team will repair the closure using appropriate measures.

Inspections:

- Follow up inspections are scheduled following closure
- Attention is be given to vegetative cover and wildlife use
- The HMOSPT schedules monitoring visits approximately once a year at remote locations

### SECTION 3

## References

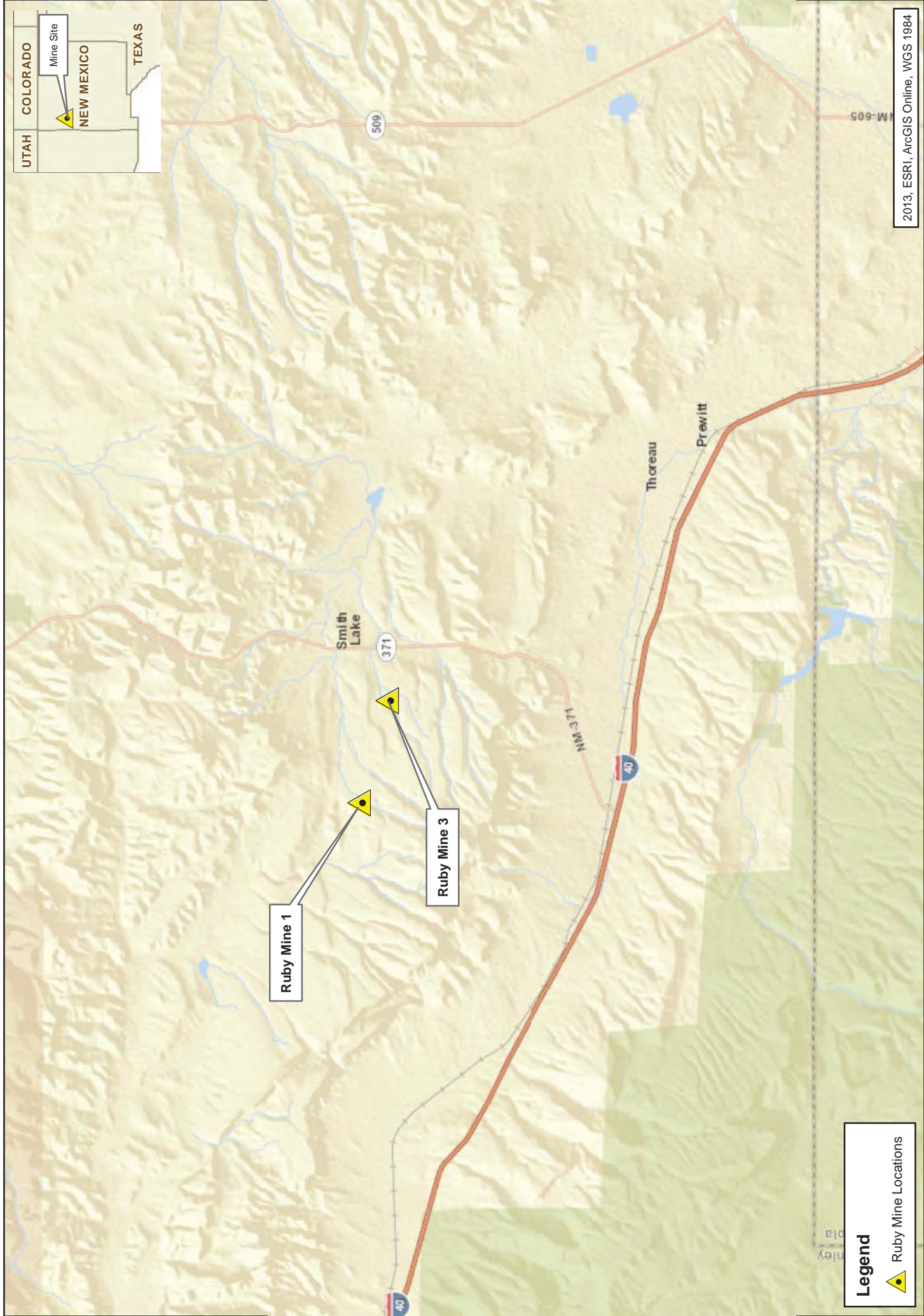
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- U.S. Department of the Interior, Bureau of Land Management (BLM), 1991. "Reclamation of Allotted Uranium Leases", letter issued by Rio Puerco Resource Area Office of BLM. May 8.
- Weston Solutions, Inc. (Weston), 2009a. Navajo Abandonment Uranium Mine Site Screening Report, Ruby No. 1 AUM Site, Navajo AUM Eastern Region. May.
- Weston, 2009b. Navajo Abandonment Uranium Mine Site Screening Report, Ruby No. 3 AUM Site, Navajo AUM Eastern Region. May.



## Figures

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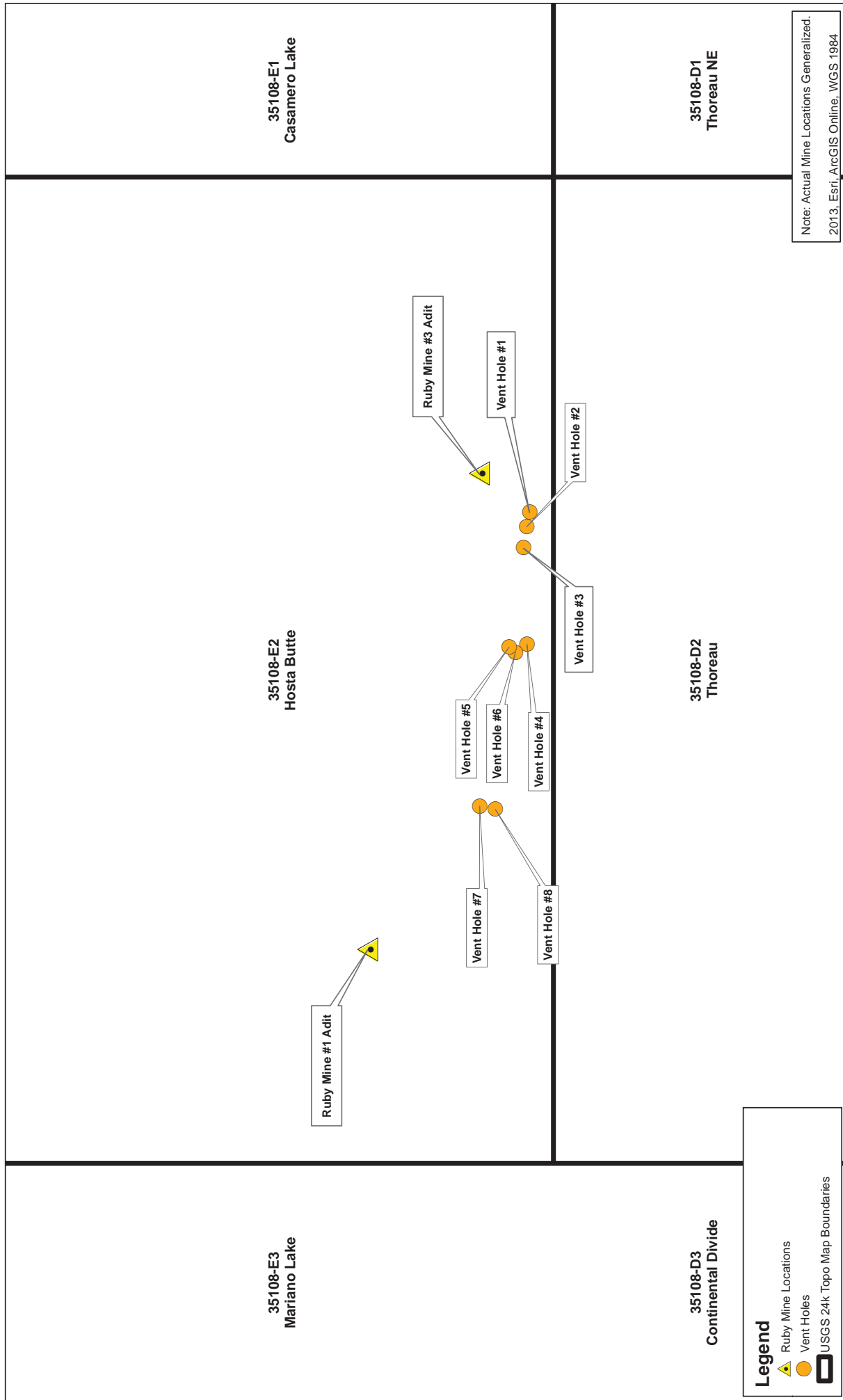
**Legend**  
 ▲ Ruby Mine Locations

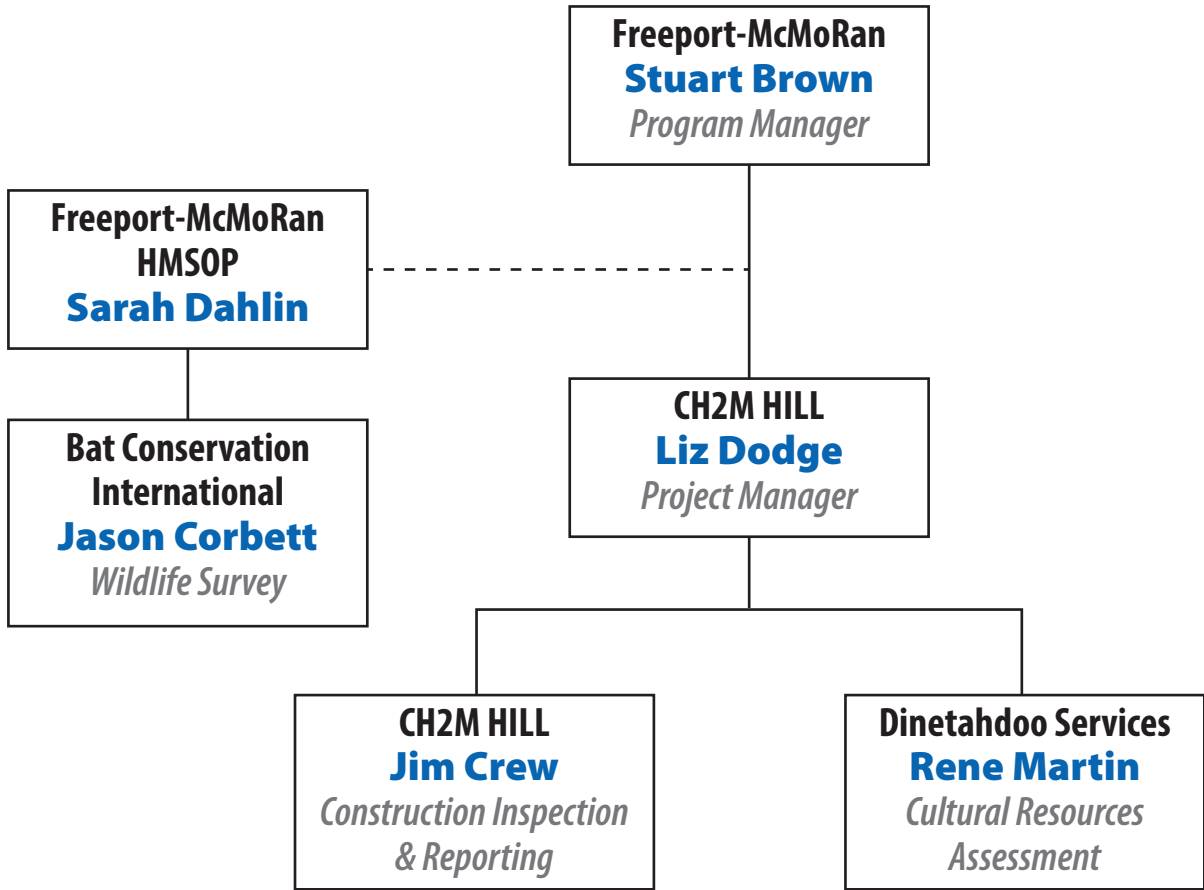


2013, ESRI, ArcGIS Online, WGS 1984



**Figure 1**  
**Ruby Mines 1 and 3**  
 General Location Map  
**CH2MHILL**





**Figure 3**  
 Organization Chart  
 Ruby Mines 1 and 3

**Appendix A**  
**Fence Inspection Reports**

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## FENCING INSPECTION CHECKLIST

Location: Smith Lake, Thoreau, NM

Date: 01/03/2013

Description: Ruby #1, Adit Fencing

Time: 1100

Weather: Cold, 10°-20°F, Snow Accumulation between 1' and 3'

This checklist is designed for Yes or NA (Not Applicable) answers to indicate a satisfactory condition. A No response needs corrective attention and details in the comment column.

RUBY MINES*	Yes or NA	NO	Comments
Proper Warning Signage	Y		
Stakes in Working Order (Good Condition)	Y		
Stakes Firmly Installed in Ground	Y		
Fencing Wire in Working Order (Good Condition)	Y		
Fencing Wire Installed and Connected to Stakes Properly and Securely	Y		
Free of Vandalism	Y		
Free of Signs of Human Entry	Y		
Fence Properly Labeled with Location Identification	Y		
Fencing and signs free of Cosmetic Damage	Y		
Structurally Sound	Y		
Additional Comments	Y		Appearance of small rabbit burrow inside of fence and tracks leading to it
<b>Conducted by:</b>	<b>Jim Crew (CH2M HILL), Jennifer Laggan (CH2M HILL), Stanley Edison (Navajo EPA)</b>		

\*See Below Photos of Ruby #1 Adit Fencing



**PHOTO 1:** Approaching Ruby Mine #1 Adit and fencing facing east-northeast. Note deep snow.



**PHOTO 2:** Approaching Ruby Mine #1 Adit and fencing surrounding adit facing east-northeast.





**PHOTO 3:** Ruby Mine #1 Adit, fencing and warning signage, suspected rabbit tracks and rabbit burrow visible at bottom of picture. View facing east-northeast.



**PHOTO 4:** Ruby Mine #1 Adit, suspected rabbit burrow inside of fencing.



**PHOTO 5:** Ruby Mine #1 Adit, Warning signage on adit fence. View from southwest side of fencing.





**PHOTO 6:** Ruby Mine #1 Adit and fencing, facing east.



**PHOTO 7:** Ruby Mine #1 Adit and fencing, facing east.



PHOTO 8: Ruby Mine #1 Adit and fencing, facing east.





## FENCING INSPECTION CHECKLIST

Location: Smith Lake, Thoreau, NM

Date: 01/03/2013

Description: Ruby #1, Vent Fencing

Time: 1230

Weather: Cold, 10°-20°F, Snow Accumulation between 1' and 3'

This checklist is designed for Yes or NA (Not Applicable) answers to indicate a satisfactory condition. A No response needs corrective attention and details in the comment column.

RUBY MINES*	Yes or NA	NO	Comments
Proper Warning Signage	Y		
Stakes in Working Order (Good Condition)	Y		
Stakes Firmly Installed in Ground	Y		
Barbed Wire in Working Order (Good Condition)	Y		
Barbed Wire Installed and Connected to Stakes Properly and Securely	Y		
Free of Vandalism	Y		
Free of Signs of Human Entry	Y		
Fence Properly Labeled with Location Identification	Y		
Fencing and Signage Free of Cosmetic Damage	Y		
Structurally Sound	Y		
Additional Comments	Y		Due to cold weather and precipitation, water in vent was frozen at 3' bgs
<b>Conducted by:</b>	<b>Jim Crew (CH2M HILL), Jennifer Laggan (CH2M HILL), Stanley Edison (Navajo EPA)</b>		

\*See Attached Photos of Ruby #1 Vent Fencing



**PHOTO 1:** Approaching Ruby Mine #1 Vent and fencing, facing southeast.





PHOTO 2: Ruby Mine #1 Vent fencing and warning signage, facing southeast.



**PHOTO 3:** Ruby Mine #1 Vent opening and fencing, from north side of vent. Note water inside of vent frozen to 3'-4' bgs.



PHOTO 4: Ruby Mine #1 Vent and warning signage on vent fencing, from north side of vent.





PHOTO 5: Ruby Mine #1 Vent fencing and warning signage, from northeast side of vent.





## FENCING INSPECTION CHECKLIST

Location: Smith Lake, Thoreau, NM

Date: 03/20/2013

Description: Ruby #1, Adit Fencing

Time: 1025

Weather: 44°, sunny, breezy

This checklist is designed for Yes or NA (Not Applicable) answers to indicate a satisfactory condition. A No response needs corrective attention; details are in the comment column.

RUBY MINES*	Yes or NA	NO	Comments
Proper Warning Signage	Y	<input type="checkbox"/>	
Stakes in Working Order (Good Condition)	Y	<input type="checkbox"/>	
Stakes Firmly Installed in Ground	Y	<input type="checkbox"/>	
Barbed Wire in Working Order (Good Condition)	Y	<input type="checkbox"/>	No barbed wire, field fencing.
Barbed Wire Installed and Connected to Stakes Properly and Securely	Y	<input type="checkbox"/>	No barbed wire, field fencing.
Free of Vandalism	Y	<input type="checkbox"/>	
Free of Signs of Human Entry	Y	<input type="checkbox"/>	
Fence Properly Labeled with Location Identification	Y	<input type="checkbox"/>	
Fencing and Signage Free of Cosmetic Damage	Y	<input type="checkbox"/>	
Structurally Sound	Y	<input type="checkbox"/>	
Additional Comments	Y	<input type="checkbox"/>	Small animal tracks noted outside of fencing. Possible small animal's burrow located within fencing (see photos).
<b>Conducted by:</b>	<b>Jim Crew (CH2M HILL), Stanley Edison (Navajo EPA)</b>		

\*See Attached Photos of Ruby #1 Adit Fencing

**PHOTO 1:** Approaching Ruby Mine #1 Adit and fencing, facing east.





**PHOTO 2:** Ruby Mine #1 Adit fencing and warning signage, facing south. Small burrow visible next to stake.



**PHOTO 3:** Ruby Mine #1 Adit opening and fencing, facing east. Note field fencing and no barbed wire.





PHOTO 4: Ruby Mine #1 Adit warning sign and fencing. Facing south.



**PHOTO 5:** Ruby Mine #1 Adit opening and fencing. Facing south.





**PHOTO 6:** Ruby Mine #1 Adit. Small burrow inside of fencing. Photo taken from above.



**PHOTO 7:** Ruby Mine #1 Adit opening and fencing. Facing east.





## FENCING INSPECTION CHECKLIST

Location: Smith Lake, Thoreau, NM

Date: 03/20/2013

Description: Ruby #1, Vent Fencing

Time: 1130

Weather: 50°, sunny, breezy

This checklist is designed for Yes or NA (Not Applicable) answers to indicate a satisfactory condition. A No response needs corrective attention; details are in the comment column.

RUBY MINES*	Yes or NA	NO	Comments
Proper Warning Signage	Y	<input type="checkbox"/>	
Stakes in Working Order (Good Condition)	Y	<input type="checkbox"/>	
Stakes Firmly Installed in Ground	Y	<input type="checkbox"/>	
Barbed Wire in Working Order (Good Condition)	Y	<input type="checkbox"/>	
Barbed Wire Installed and Connected to Stakes Properly and Securely	Y	<input type="checkbox"/>	
Free of Vandalism	Y	<input type="checkbox"/>	
Free of Signs of Human Entry	Y	<input type="checkbox"/>	
Fence Properly Labeled with Location Identification	Y	<input type="checkbox"/>	
Fencing and Signage Free of Cosmetic Damage	Y	<input type="checkbox"/>	
Structurally Sound	Y	<input type="checkbox"/>	
Additional Comments	Y	<input type="checkbox"/>	Deceased deer in vent. No signs of damage to fencing.
<b>Conducted by:</b>	<b>Jim Crew (CH2M HILL), Stanley Edison (Navajo EPA)</b>		

\*See Attached Photos of Ruby #1 Vent Fencing



**PHOTO 1:** Approaching Ruby Mine #1 Vent and fencing, facing southeast.



PHOTO 2: Ruby Mine #1 Vent fencing and warning signage, facing south.





**PHOTO 3:** Ruby Mine #1 Vent opening and fencing, facing south.



**PHOTO 4:** Ruby Mine #1 Vent taken from above. Note dead deer inside of vent.





**PHOTO 5:** Ruby Mine #1 Vent fencing and warning signage, facing northeast.



**PHOTO 6:** Ruby Mine #1 Vent fencing and warning signage, facing northeast.





**PHOTO 7:** Ruby Mine #1 Vent opening. Note dead deer inside of vent. Photo taken from above.



**Appendix B**  
**HMSOP Health and Safety Plan**

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# **HMOSP HEALTH AND SAFETY PLAN**

*Ruby Mine*

*Prepared by*

**Reclamation Services**

**Historic Mine-Openings Safety Program (HMOSP)**

**Oro Valley, AZ 85737**

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**APPENDICES**

- Appendix A: General Code of Safe Practices**
- Appendix B: Employee Training Attendance Form**
- Appendix C: Contractor Health and Safety Manual**
- Appendix D: Job Hazard Analyses**
- Appendix E: SOP**

## HEALTH AND SAFETY PLAN APPROVALS

---

By their signatures, the undersigned certify this Health and Safety Plan (HASP) is approved for the HMOSP Mine Closure Projects. It is expected that the project personnel, contractors and site visitors will maintain compliance with it.



Dave Paszkiet  
Project Manager, Engineering

05/03/2013

Date



Phillip Seaman  
Health and Safety Manager

05/03/2013

Date



William J. Hetrick, CIH  
Senior Industrial Hygienist

5/3/2013

Date



## **1.0 INTRODUCTION**

The mission of the Historic Mine-Opening Safety Program (HMOSP) is to safely close mine openings that can harm individuals without causing excessive disturbance to the surrounding environment and wildlife.

### **1.1 Objective**

The objective of this Health and Safety Plan (HASP) is to provide direction and authority for establishing safe working conditions on HMOSP Mine Shaft and Adit Closure Projects. Since each project site has conditions that may vary, this HASP is accompanied by additional site specific details that are located in **Section 15**. The contents of Section 15 may change from project site to project site but it will be augmented by the information in this HASP and any attachments to it. The safety organization, procedures and protective equipment identified have been established based upon an analysis of potential hazards and have been evaluated and selected to minimize the potential of accident or injury. Operational changes that could affect the health and safety of personnel, the community or the environment require the prior approval of the Project Manager and the Senior Industrial Hygienist. Specific requirements may be revised if new information is received or conditions change. A written amendment will document all changes made to the plan and may be incorporated as a new Appendix.

### **1.2 Policy Statement (H & S Policy)**

The HMOSP department is committed to Safe Production and the philosophy of zero incidents, injuries, fatalities and occupational illnesses. Employees will be properly trained and held accountable for following all prescribed safety procedures and practices. Safety and Health will not be compromised. Each employee is responsible for their own personal safety and for the environment in which they work. No job will be considered so important, and no schedule so urgent that time cannot be taken to perform work in a safe manner. Working safely is a condition of employment. The provisions of this plan are mandatory for all personnel and subcontractors assigned to the project as well as for all visitors to the work site.

As a matter of policy, we will hold all contractors operating at the various HMOSP site closures accountable for the same level of safety that we expect for ourselves, and as described in the Contractors Health and Safety Manual (provided to all contractors). All contractors (and sub-contractors) will observe all of the requirements in this HASP including, but not limited to, criteria for medical exams, drug and alcohol tests, training and use of personal protective equipment (PPE).

### **1.3 Compliance with OSHA Regulations**

Only personnel who have recently completed 40 hours of hazardous waste operations training as defined by OSHA under 29 CFR 1910.120 or have completed 40-hour training and subsequent refresher training hazardous waste operations, will be allowed to work within a site area designated as an Exclusion Zone (EZ) or Contamination Reduction Zone (CRZ). These criteria apply to all individuals including, but not limited to, employees, contractors and regulatory personnel. Personnel who do not comply with the OSHA criteria, such as occasional or infrequent visitors to the site who will not have the potential for physical exposure to the regulated chemicals (no potential for dermal or respiratory exposure), would not require the training and medical examination; these individuals may enter the designated Support Zone (SZ).

## **1.4 Employee and Contractor Acknowledgement of HASP Requirements**

This HASP summarizes health and safety hazard information for site activities. In addition, all site work will be conducted in accordance with requirements of the General Code of Safe Practices as stated in **Appendix A**. All employees covered by this HASP who cannot, or will not, comply with the Code of Safe Practices will be excluded from site activities. All project personnel must acknowledge that they have read and understand this HASP by signing the “Employee Training Attendance Form” in **Appendix B**.

Each contractor at the site must meet the requirements of the HASP as minimum health and safety requirements. All contractors and sub-contractors are ultimately responsible for the safety of their employees and compliance with applicable regulations and they must acknowledge they have read and understand this Health and Safety Plan, the General Code of Safe Practices and, if applicable, the Contractor Health and Safety Manual (February 2013, Revision 4) (See **Appendix C**).

## **1.5 Radioactive Materials License**

In the event that a HMOSP work site has radiation concerns, a Radiation Safety Plan (RSP) may be required as well as complying with specific Radiation Materials License criteria. If the RSP is required, it will be included in Section 16.0 of this HASP.

## **2.0 BACKGROUND AND SCOPE OF WORK**

The work to be completed will involve the closure of mine openings including shafts, tunnels, adits, trenches and prospect holes. Soil removal operations and associated tasks compose the majority of activities described in the scope of work. All personnel performing work around vertical mine openings (shafts) will follow the guidelines found within the Fall Protection and Rope Safety (SOP) report included in **Appendix E**.

If any radioactive materials require excavation and removal, and are planned to be removed from the site, they will be disposed of at a licensed processing/disposal facility. Therefore, soil removal operations will rely on rigorous determination of excavation requirements, including both lateral and vertical extent of soil removal, during the field remedial activities operations.

### **2.1 Area Preparation**

Area preparation, as required, will be executed to provide safe and efficient removal operations including location and marking of utilities.

## **3.0 KEY PERSONNEL / ORGANIZATIONAL STRUCTURE**

A list of consultants, contractors, subcontractors and employees authorized to participate in the remedial activities will be compiled and maintained by the Site Supervisor.

All personnel listed shall meet all of the requirements of the HASP prior to participating in any field activities. The responsibilities of all consultants and contractor personnel performing remediation activities include:

- Complying with all aspects of the HASP;
- Complying with the Site Health and Safety Officer (SHSO) or Site Supervisor directives; and
- Notifying the SHSO or Site Supervisor of hazardous or potentially dangerous incidents or

work situations.

### **3.1 Key Personnel Responsibilities**

Implementation of this HASP and the RSP, if and when applicable, will be the shared responsibility of the Project Manager (PM), Superintendent, Site Supervisor, Site Health and Safety Officer, Health and Safety Manager, Sr. Industrial Hygienist (IH) and Radiation Safety Officer (RSO). All project personnel are expected to comply with and participate in the implementation of these plans.

#### **3.1.1 Project Manager**

The Project Manager (PM) is responsible for ensuring that the work performed for these projects is performed in accordance with the contract requirements, and that field activities are conducted in accordance with the HASP. The PM has the primary responsibility of ensuring that the requirements of this HASP are implemented throughout the duration of the project.

To the extent necessary, the PM will coordinate onsite activities with regulatory representatives, contractors and other resource personnel. The PM has authority to suspend all work that poses any health and safety risk in coordination with the Site Supervisor. Some of the specific responsibilities include:

- Assuring that all personnel to whom this HASP applies, including all subcontractors, have received a copy
- Provide the SHSO or Site Supervisor and the IH with updated information regarding the scope of site work and any changes that may occur
- Coordinate the activities of all subcontractors and ensure that they are aware of the pertinent health and safety requirements for this project, including the requirements related to training and the use of personal protective equipment and respiratory equipment

#### **3.1.2 Superintendent, Site Supervisor/Site Health and Safety Officer (SHSO)**

The Site Supervisor for this project has direct supervision over all onsite personnel. The Site Supervisor will coordinate daily site-specific work efforts and ensure all activities are in strict compliance with the site-specific health and safety plan and HMOSP's standard operating procedures.

The SHSO or Site Supervisor will be appointed by the Project Manager and is responsible for enforcing the requirements of this HASP once work begins. The SHSO or Site Supervisor has the authority to immediately correct all situations where noncompliance with this HASP is noted and to immediately stop work in cases where an immediate danger is perceived. Some of the SHSO's or Site Supervisor's specific responsibilities include:

- Work closely with the Radiation Safety Officer(if required) to ensure consistent compliance is maintained with the HASP as well as the Radiation Safety Plan (RSP)
- Ensure that all personnel, to whom this HASP applies, including subcontractors, have reviewed the HASP and acknowledged having done so
- Assuring that all personnel to whom this HASP applies, including subcontractors, have attended a pre-entry briefing prior to entering an Exclusion Zone and attend and participate in all subsequent safety meetings
- Preparing the Job Hazard Analyses (JHA) and Job Risk Analyses (JRA) as necessary to ensure that all hazardous tasks not previously identified in this HASP have been properly addressed and that a sufficient control measure has been identified for those tasks
- Maintain a high level of health and safety consciousness among employees
- Work with the Industrial Hygienist and Radiation Safety Officer to ensure that all required air monitoring is completed
- Procuring and distributing the PPE and safety equipment required for this project
- Verifying all PPE and health and safety equipment is in good working order

- Verifying all contractors provide adequate supplies of PPE for their staff
- Ensure proper decontamination procedures are followed for equipment and personnel (if applicable)
- Stopping work in the event that an immediate danger situation is perceived
- Monitoring and controlling the safety performance of all personnel within the established restricted areas to ensure that required safety and health procedures are being followed
- Conducting accident/incident investigations, prepare investigation reports and communicate results of incident analysis
- Conducting the pre-entry briefing and subsequent safety meetings as required by Section 4.0 respectively of this HASP
- Initiating emergency response procedures in accordance with Section 13.0 of this HASP
- Maintain the project Safety and Health Records including the industrial hygiene and environmental instrumentation monitoring and calibration data, physician's authorization to work, maintenance of Material Safety Data Sheets (MSDS), and other technical references and/or toxicological information

### **3.1.3 Health and Safety Manager/Sr. Industrial Hygienist**

The Health and Safety Manager and the Sr. Industrial Hygienist will provide the necessary technical, occupational health and safety and OSHA regulatory oversight to ensure that this program is implemented in accordance with the requirements outlined in the work plan and this HASP. Working closely with the PM and the SHSO or Site Supervisor, they will also have the authority to stop work in the event that an imminent risk is anticipated during site operations. The Health and Safety Manager and Sr. Industrial Hygienist will verify compliance with the HASP through frequent audits and assist with the preparation and review of the JHA and JRA, review of exposure monitoring data and trenching and excavation practices, hot work and confined space entry permits and training as deemed necessary by 29 CFR 1910.120 or other applicable regulations.

The Health and Safety Manager is responsible for the development, implementation, and oversight of the Safety and Health Program and this HASP. The site PM may designate a fully trained and experienced individual to be the SHSO who will assist in continually enforcing safety policies and procedures onsite. The Sr. Industrial Hygienist and the Radiation Safety Officer will provide the necessary technical, occupational health and safety, and compliance regulatory oversight to ensure that this program is implemented in accordance with the requirements outlined in the work plan, this HASP and the Radiation Safety Plan (RSP).

### **3.1.4 Radiation Safety Officer (RSO)**

If an RSO is needed the RSO shall be responsible for the administration and implementation of a Radiation Safety Program (RSP) that will be included when applicable to a specific project. Responsibilities of the RSO include:

- Implementing and monitoring compliance with the RSP, conducting radiation safety training for all site workers and visitors, making adjustments to the RSP as necessary based on field measurements, maintaining records of radiation exposure rate measurements, personnel and equipment surveys, and worker training
- Maintaining the Decontamination Reduction Zone and ensuring proper decontamination of equipment and personnel with respect to radiation exposure
- Establishing procedures for vehicle decontamination as well as proper shipping, manifesting and placarding of low level radioactive waste that is to be shipped off-site



### **3.2 Contractors and Other Site Personnel**

All site contractors are required to comply with the provisions of this HASP and the RSP (when applicable). Each onsite contractor shall be responsible for compliance with OSHA construction safety standards (29 CFR 1926) and all applicable state, federal and local safety and health regulations including compliance with 29CFR 1910.120, Hazardous Waste Operations and Emergency Response.

All contractors are required to delineate management responsibilities within their organization and provide subcontractor oversight as necessary, in addition to:

- Complete a review of this HASP and the site specified information prior to the start of onsite work
- Appoint an onsite safety coordinator to interface with the SHSO or Site Supervisor
- Prepare JHA and the JRA for any tasks that involve hazards or risks not previously identified in the HASP and submitting them to the SHSO or Site Supervisor for review
- Secure the necessary equipment to control any new hazards and risks identified in the JHA and JRA
- Provide SHSO or Site Supervisor with MSDSs for any hazardous materials they bring onsite
- Provide appropriate PPE and safety equipment for their employees
- Participate in the pre-entry briefing and conduct daily safety meetings
- Ensure, via daily inspections, that their equipment is maintained in good working condition
- Safe completion of day to day field operations and safe equipment operation

### **4.0 SAFE PRODUCTION AND SITE SAFETY MEETINGS**

No person will be allowed in the general work area during site operations without first receiving a site hazard briefing.

Site supervision and all personnel will participate in daily “tailgate” safety meetings to discuss site hazards, the effectiveness of health and safety procedures, and any need for revision. These meetings will be held at the onset of activities each day, at the beginning of new tasks or when revisions that may affect worker health and safety are made to existing tasks. Tailgate meetings shall include all contractor personnel performing work at the site. All meeting attendees shall sign in and topics discussed shall be recorded on a tailgate safety meeting form.

#### **4.1 Monthly Safety Meeting**

Each month there will be a formal “All Hands” Safety Meeting that will have an agenda to address recent incidents and corrective actions taken, status of site safety performance (HMOSP and contractor), project safety and health concerns, achievement of site Safety Objectives and recognition of those employees demonstrating outstanding safety behavior and contribution. Attendance at Monthly Safety Meetings will be documented. If an employee misses a safety meeting, their supervisor will sit down with them at another time to review the material covered during the safety meeting.

### **5.0 POTENTIAL HEALTH AND SAFETY HAZARDS**

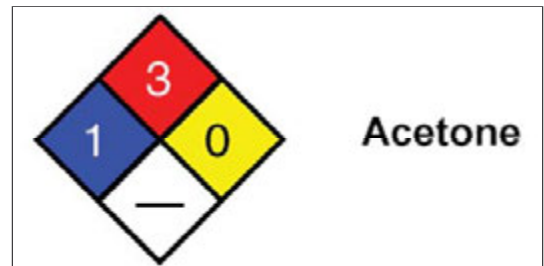
#### **5.1 Chemical Hazards - MSDS**

Specific Contaminants of Concern that have specific OSHA Permissible Exposure Levels will be listed in Section 15 of the respective site-specific project information. A review of potential health hazards

associated with Site-Specific Contaminants of Concern will be conducted as part of the project Hazard Communication Program and that information is also listed in Section 15 as applicable. Each contractor is responsible for training their employees regarding the specific hazards of chemicals they work with. Similarly, the RSP will address the potential health hazards associated with low level radiation and uranium decay products.

### **5.1.1 Hazardous Substances Brought Onsite by HMOSP Employees or Contractors**

A material safety data sheet (MSDS) must be available for each approved hazardous substance that HMOSP employees or contractors (and subcontractors) bring on site. The SHSO will maintain a file of MSDSs for these materials on site to permit accessibility to all onsite. Each material will also have been reviewed by the Chief Environmental Engineer and Industrial Hygienist prior to use. This review will also generate an electronic file of those MSDSs approved for use on site. In addition, all containers of hazardous materials must be labeled in accordance with OSHA's Hazard Communication Standard. Either the original manufacturer's label or an NFPA 704M label specific for the material (sample shown for "Acetone") is considered to be an acceptable label.



### **5.2 Physical Hazards**

Physical hazards include but are not limited to heavy equipment, flat and irregular terrain, utilities, slips, trips, falls, traffic, lifting, electricity, sharp objects, severe weather, noise, temperature extremes, fire, moving vehicles and power equipment.

HMOSP and site management will utilize Consequence Thinking and HERA (Hazard Evaluation Risk Analysis) when encountering hazards not covered by instruction. Safe Operation Procedures (SOPs) will be used as required (e.g., Lock Out-Tag Out, Confined Space Entry, Fall Protection, Hot Work Permit, etc.) and will continue to be updated when encountering any hazards.

Confined Space Entry Permit requirements will be filled out where applicable to HMOSP adit and shaft closure program SOP's.

### **5.3 Biological Hazards**

Biological hazards include insects, small biting animals, poisonous plants, poisonous reptiles and insects (e.g., rattlesnakes, black widow spiders) and pathogens (e.g., Hantavirus, West Nile virus).

#### **5.3.1 Snakes**

Contact with snakes on the site is considered likely. Rattlesnakes of various species have been identified onsite during all seasons of the year. Snake venoms are complex and produce neurotoxic effects, with sensory, motor, cardiac and respiratory difficulties; cytotoxic effects on red blood cells, blood vessels, heart muscle, kidneys, and lungs; defects in coagulation; and effects from local release of substances by enzymatic actions. Other noticeable effects of venomous snake bites include swelling, edema and pain around the bite and the development of ecchymosis (the escape of blood into tissues from ruptured blood vessels).

To minimize the threat of snake bites and insect hazards, all personnel walking through vegetated areas will be made aware of (during training) the potential for encountering snakes and will avoid actions such as turning over logs, rocks, etc., that could increase the potential. Additional caution will be exercised around preferred snake habitat. If bitten by a snake, the victim should be kept still and transported to the

nearest hospital as soon as possible. First aid consists of applying a constriction band and washing the area around the wound to remove any unabsorbed venom. No cutting and sucking should be performed.

### **5.3.2 Rocky Mountain Spotted-Fever (RMSF)**

Rocky Mountain Spotted-Fever is transmitted via the bite of an infected tick. The tick must be attached 4 to 6 hours before the disease-causing organism (*Rickettsia rickettsii*) becomes reactivated and can infect humans. The primary symptom of Rocky Mountain Spotted-Fever is the sudden appearance of a moderate to high fever. The fever may persist for two to three weeks. The victim may also have a severe headache, deep muscle pain and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, Rocky Mountain Spotted-Fever may be confused with measles or meningitis. The disease may cause death if untreated, but if treated promptly, death is uncommon. Although RMSF was identified in the Rocky Mountain States, reports from CDC indicate that over half of the cases are reported from the South Atlantic States. April through September are the most common months for tick bites and cases of RMSF to be reported.

A tick repellent, containing DEET (N, N-diethyl-m-toluamide), should be used in tick infested areas, and pant legs should be tucked into boots. In addition, workers should be mindful of tick infested areas and check exposed body parts frequently for attached ticks. Ticks should be removed promptly and carefully without crushing, since crushing can squeeze the *Rickettsia* into the skin. A gentle and steady pulling action should be used to avoid leaving the head or mouth parts in the skin. Hands should be protected with surgical gloves when removing ticks. Any environment where ticks may be present should prompt personal body inspection at the end of each shift.

### **5.3.3 Poisonous Plants**

Poisonous plants may be present in the work area. The primary means of controlling exposure is to avoid contact with the plant, cover arms and hands and frequently wash potentially exposed skin. If work areas are located where poisonous plants such as poison ivy, poison sumac or poison oak may be encountered, personnel should wear long pants, long sleeves and gloves to minimize the possibility of exposure. In some areas, the use of a Tyvek or other protective suit may be advisable. Particular attention must be given to avoiding skin contact with objects or protective clothing that have touched the plants. The oils and resins can be easily transferred onto other clothing. Treat every surface that may have touched the plant as contaminated. If skin contact is made, the area should be washed immediately with soap and water, and observed for signs of reddening. Clothing potentially contaminated with poisonous plant oils or resins should be washed separate from other articles.

### **5.3.4 Black Widow Spider**

Shiny, black and with a red hourglass marking on the abdomen of the female, The Black Widow Spider is found in dark corners of sheds, under logs and in rock piles. Black widows are found in both settled and unsettled areas. The spider will bite, if provoked, and the bite can be dangerous to people of all ages, although it is seldom fatal. However, the pain can spread throughout the body, accompanied by headache, dizziness, nausea and excruciating cramps. Ice is very helpful and if put on the wounded area immediately, can detoxify the bite.

### **5.3.5 Hantavirus and West Nile Virus**

Hantavirus Pulmonary Syndrome (HPS) is a deadly disease from rodents. Humans can contract the disease when they come into contact with infected rodents or their urine and droppings. Although rare, HPS is potentially deadly. Symptoms can appear from 3 days to 6 weeks after infection, but usually within 2 weeks. The first symptoms are general and flu-like: fever (101-104 F), headache, stomach pain, joint and lower back pain, coughing, and sometimes nausea and vomiting. The main symptom is difficulty breathing as the lungs fill with fluid. Rodent control in and around the building structures,

outdoor storage areas and residences remains the primary strategy for preventing Hantavirus infection. Use a bleach solution or household disinfectant to effectively deactivate Hantaviruses when cleaning rodent infestations.

West Nile virus is a mosquito borne virus that has three different effects on humans. The first is an infection with no symptoms; the second stage has an incubation period of 2 to 8 days followed by fever, headache, chills, excessive sweating, weakness, swollen lymph nodes, drowsiness, pain in the joints and symptoms like those of the common cold. The more dangerous encephalitis is characterized by similar early symptoms but also a decreased level of consciousness, sometimes approaching coma like conditions. Recovery is marked by a long convalescence with fatigue.

#### **5.4 Radiological Hazards**

Any radiological hazards will be dealt with appropriately. If applicable, specific details will be located in Section 16.

#### **5.5 Noise**

Noise exposure at or above the action level (85 decibels [dBA]) is likely during some remedial activities. Exposure to noise levels in excess of 90 dBA, the OSHA permissible exposure limit (PEL) for noise, is possible during heavy equipment operation. Sound level monitoring may be required to characterize the noise levels. Noise monitoring during similar heavy equipment operations have revealed noise levels at or above 85 dBA and, if this is identified, a hearing conservation program will be required for all affected workers.

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 the exposure to noise. In addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of accidents onsite.

#### **5.6 Heat Stress**

The wearing of protective clothing may increase the potential for workers to succumb to the stresses associated with working in hot environments. The symptoms of these stresses as well as techniques that can be implemented to minimize the potential for heat stress are addressed below.

Heat related problems include heat rash, fainting, heat cramps, heat exhaustion and heat stroke. Heat rash can occur when sweat isn't allowed to evaporate, leaving the skin wet most of the time and making it subject to irritation. Fainting may occur when blood pools to lower parts of the body and as a result, does not return to the heart to be pumped to the brain. Heat related fainting often occurs during activities that require standing erect and immobile in the heat for long periods of time. Heat cramps are painful spasms of the muscles due to excessive salt loss associated with profuse sweating. Heat exhaustion results from the loss of large amounts of fluid and excessive loss of salt, from profuse sweating. The skin will be clammy and moist and the affected individual may exhibit giddiness, nausea and headache. Heat stroke occurs when the body's temperature regulatory system has failed. The skin is hot, dry, red and spotted. The affected person may be mentally confused and delirious. Convulsions could occur. **EARLY RECOGNITION AND TREATMENT OF HEAT STROKE ARE THE ONLY MEANS OF PREVENTING BRAIN DAMAGE OR DEATH.** A person exhibiting signs of heat stroke should be removed from the work area to a shaded area. The person should be cooled by any means possible, removing clothing, apply ice pack under arm pits, around the groin, or soak with water to promote evaporation. Fan the person's body to increase cooling. Increased body temperature and physical discomfort also promote irritability and a decreased attention to the performance of hazardous tasks.

Early Symptoms of Heat-Related Health Problems:

- Decline in task performance

- Excessive fatigue
- Decline in alertness
- Muscle cramps
- Dizziness

Susceptibility to Heat Stress Increases due to:

- Lack of physical fitness
- Obesity; increased age
- Lack of acclimatization; dehydration
- Drug or alcohol use
- Sunburn; infection

People unaccustomed to heat are particularly susceptible to heat fatigue. Employees who have no experience, or limited experience, in various levels of PPE need to gradually adjust to the heat.

#### The Effect of Personal Protective Equipment

Sweating normally cools the body as moisture is removed from the skin by evaporation. However, the wearing of certain personal protective equipment (PPE), particularly chemical protective coveralls (e.g., Tyvek), reduces the body's ability to evaporate sweat and thereby regulate heat buildup. The body's efforts to maintain an acceptable temperature can therefore become significantly impaired by the wearing of PPE.

#### Measures to Avoid Heat Stress

The following guidelines should be adhered to when working in hot environments:

- Establish work-rest cycles (short and frequent are more beneficial than long and seldom).
- Identify a shaded, cool rest area.
- Adjusted work schedules to eliminate working at the peak hours of the day.
- Rotate personnel, alternative job functions.
- Water intake should be equal to the sweat produced. Most workers exposed to hot conditions drink less fluid than needed because of an insufficient thirst. **DO NOT DEPEND ON THIRST TO SIGNAL WHEN AND HOW MUCH TO DRINK.** For an 8-hour work day, 50 ounces of fluids should be drunk.
- Eat lightly salted foods or drink salted drinks such as Gatorade to replace lost salt.
- Save most strenuous tasks for non-peak heat hours such as the early morning or at night.
- Avoid alcohol during prolonged periods of heat. Alcohol will cause additional dehydration.
- Avoid double shifts and/or overtime.
- The implementation and enforcement of the above mentioned measures will be the joint responsibility of the PM, Site Supervisor, and SHSO. Potable water and fruit juices should be made available each day for the field team.

#### Heat Stress Monitoring Techniques

Site personnel should regularly monitor their heart rate as an indicator of heat strain using the following procedure:

Check radial pulse rates by using fore-and middle fingers and applying light pressure to the pulse in the wrist for one minute at the beginning of each rest cycle. If the pulse rate exceeds 110 beats/minute, shorten the next work cycle by one-third with the rest period kept the same. If, after the next rest period, the pulse rate still exceeds 110 beats/minute, the work cycle will be shortened again by one-third.



## **6.0 SITE HAZARD CONTROLS**

Chemical, physical and biological hazards will be minimized through employee training, engineering controls, administrative controls and, when necessary, personal protective equipment (PPE). The Radiation Safety Plan will address any issues related to exposure to low level radiation, exposure monitoring, employee training and the safe handling of soils that are to be disposed of off-site.

Specific controls are addressed throughout the HASP, in the General Code of Safe Practices and SOP's. Job Hazard Analyses (JHA) and Job Risk Analyses (JRA) are provided for several anticipated operations. As tasks may be modified or new tasks identified, the JHA and JRA should be modified or written to address the hazards and risks identified and the controls to be used. All employees are to review the JHA and JRA pertinent to their job or assigned tasks before initiating work. The JHA and JRA review is to be included in the 3 day onsite field observations conducted by the employee's supervisor.

### **6.1 Emergency Entry and Exit**

People who will enter the site on an emergency basis will be briefed of the hazards by the PM, SHSO or Site Supervisor. All 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 pre-defined safe assembly area for a head count. The Site Supervisor will be responsible for ensuring that all personnel and visitors who entered the work area have exited in the event of an emergency.

### **6.2 Traffic Control and Local Traffic Requirements**

A Traffic Control Plan (TCP) will be used to control all traffic as necessary although most Mine Opening Closure Projects are in areas remote from traffic areas.

All employees will be required to comply with the local traffic laws. Privately Owned Vehicles (POV) will be parked in a designated employee parking area. At no time will a POV be allowed in the work areas. POV will be required to meet all State and local requirements (i.e., license, inspection, insurance). POV failing to meet these requirements will be removed from the project at the vehicle owner's expense. Any employee of the designated contractor or any employee of any subcontractor associated with this project who receives a citation for a moving violation, State, County or City, while operating a vehicle to conduct activities within the project Scope of Work may be subject to removal from the project.

### **6.3 General Site Safety Practices**

The following measures are designed to augment the specific health and safety guidelines provided in this plan:

- The "buddy system" will be used at all times by all field personnel. No one is to perform field work alone and particular emphasis on the buddy system is to be placed when working on sloping, irregular walking or working surfaces and working within 25 feet of water. Personal Flotation Devices (PFDs) are also required for all personnel working within 25 feet of water (standing or running) as well as having available a life ring with no less than 200 feet of line. Additional criteria for working over and near water are in the General Code of Safe Practices.
- All personnel must be intimately familiar with the procedures for initiating an emergency response.
- Eating, drinking, chewing gum, tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in the

- Restricted Areas and the Contamination Reduction Zone (CRZ).
- Smoking is prohibited with the exception of those areas in the Support Zone (SZ) that are designated by the Site Project Manager. Matches and lighters are not allowed in the Exclusion Zone (EZ) or the CRZ.
  - The use of alcohol or illicit drugs is prohibited during the conduct of field operations.

## **7.0 PERSONAL PROTECTIVE EQUIPMENT**

It is anticipated that initial site activities requiring excavation, soil radiation surveys, stockpiling and handling/transfer of soil for transportation and disposal will be safety initiated in Level D Personal Protective Equipment (PPE).

### **7.1 Respiratory Protection**

Respiratory protection is not considered necessary for the HMOSP projects as currently conducted.

### **7.2 Other Safety Equipment**

In addition to the PPE specified above, the following safety items shall be available at the site:

- Portable, hand-held eyewash bottles for all site vehicles and vehicle cabs
- First aid kits (locations TBD)
- Type A-B-C fire extinguisher (number and locations TBD)
- Portable phones/radios
- Storage area for respirator cleaning equipment, cartridges, hard hats, eye protection, etc.

## **8.0 HEALTH AND SAFETY AIR MONITORING AND ACTION LEVELS**

Air monitoring will be conducted as frequently as necessary to determine the adequacy of control measures. The purpose is to help assure that employees are not exposed to harmful concentrations of airborne contaminants.

### **8.1 Personnel Exposure Monitoring**

An Industrial Hygiene Monitoring Plan has been implemented and is under control by the industrial hygiene personnel.

### **8.2 Perimeter Air Monitoring**

In addition to air monitoring used to identify and quantify potential worker exposure at all removal action work locations, perimeter air monitoring for radionuclides will be conducted during excavation and removal of radioactive contaminated soils may be integrated into the project, particularly if there is a concern for exposure to personnel or generation of contaminants offsite.

## **9.0 ENGINEERING AND ADMINISTRATIVE CONTROLS**

To the extent practicable, site contractors will implement engineering and administrative controls to reduce the spread of contamination, isolate contaminants, shield workers, and otherwise minimize the likelihood of worker injury or illness. Specific engineering and administrative controls for each activity are listed in the Health and Safety Policy.

## **9.1 Dust Control**

One of the best ways to reduce exposure to potentially contaminated soils is by reducing the generation of dust. Equipment operators will be responsible to operate their equipment such that it minimizes unnecessary soil disturbance. This includes speed reduction during travel and correct loading/unloading of all soils. If dust generation becomes a problem, the employees onsite will be responsible for implementing fugitive dust control measures. Dust will be minimized during all site operation activities. Water spray will be applied as needed to control dust during soil handling and stockpiling operations.

Specific dust control measures are engineering and administrative controls including, but not limited to, the following:

- Wetting soil to control dust
- Minimizing movement of materials
- Maintaining stable grades
- Training employees regarding task they have been assigned to perform
- Establishing controlled site access zones (includes truck crossings)
- Establishing cooling/warming areas to minimize the effect of temperature extremes
- Avoiding contact with potential contaminants
- Minimizing handling of potentially contaminated materials
- Periodically inspecting equipment to ensure that it remains in good operating condition.

## **9.2 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 will be capable of being tightly closed and will be equipped with a tap dispenser. Water will not be consumed directly from the container or dipped from the container.
- Containers used for drinking water will be clearly marked and will not be used for any other purpose.

## **10.0 DESIGNATION OF WORK ZONES**

If required, to prevent both exposure of unprotected personnel and migration of contamination due to tracking by personnel or equipment, hazardous work areas will be clearly identified and decontamination procedures will be required for personnel and equipment leaving those areas.

## **11.0 EMPLOYEE TRAINING REQUIREMENTS**

### **11.1 Health and Safety Plan Review**

Before the start of work, all employees and contractors working on this project must review the Health and Safety Plan. This HASP will be presented as part of the onsite training and is required to be reviewed prior to working onsite.

### **11.2 Hazardous Waste Operations Training**

Hazardous waste site worker training (Hazardous Waste Operations and Emergency Response Standard HAZWOPER as mandated by OSHA 29 CFR 1910.120) will be required for all personnel that have a

potential for exposure to hazardous substances, health hazards or safety hazards involved in this project. This training is a 40 hour program and is required to be off-site with a minimum of 3 days of actual field experience under the direct supervision of a trained, experienced supervisor.

### **11.3 First Aid and CPR Training**

A minimum of two First Aid/CPR trained employees will be required on each shift during hours of operation. Training that provides a sufficient number of site personnel will be provided if there are no employees available prior to mobilization. All persons on site must report any near-miss incident, accident, injury or illness to their immediate supervisor or the Site Supervisor. 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 ensured. These two reports must be completed and submitted to the Project Health and Safety Manager within 24 hours after the incident.

A field First Aid Kit will be available to all employees. Depending on the extent of ongoing operations, there may be a need for multiple First Aid Kits. The performance requirements of the first aid kits shall be based on the storage area location of the First-Aid Kit. First-Aid Kits shall be easily accessible to all workers, protected from the weather and maintained in a clean, sanitary, and fully stocked condition. The individual contents of the First Aid Kits shall be kept sterile and they shall be clearly marked and visible. The contents of First-Aid Kits shall be checked by the employer prior to their use onsite and at least every month when work is in progress to ensure that they are complete, in good condition and have not expired.

If treatment beyond first aid is required, the injured should be transported to a medical facility. If the injured cannot move, or shows any sign of not being in a comfortable and stable condition for transport, then ambulance/paramedics should be summoned. If there is any doubt as to the injured worker's condition contact the appropriate rescue service.

### **11.4 Site Management and Site Supervisor 8 Hour Training**

Onsite Management and Site Supervisors are required to complete the same 40 hour hazardous waste site worker training and 3 days of supervised field activities, plus an additional 8 hours of hazardous waste site supervisor training. The site Supervisor training includes, but is not limited to, review of the company's safety and health program, training, PPE, Medical Surveillance, spill containment and health hazard monitoring.

### **11.5 Radiation Safety Training**

If project activities require the use of nuclear density gauges or the potential exists for exposure to naturally occurring radioactive materials (NORM waste), the applicable employee training will be provided. For this project it is necessary to have a project RSP and a review of that Plan will be conducted along with 4 hours of site specific radiation safety training for all project employees prior to initiating any work with radioactive materials, waste containing radioactive decay products in soil or equipment containing a radioactive source.

### **11.6 Additional Project Training**

Freeport-McMoRan Reclamation Services will designate additional personnel to complete mandated OSHA training requirements should future project tasks require it (such as confined space entry, fall protection, lock-out tag-out, etc.).



## **11.7 Hazard Communication**

While hazardous waste and the identified Contaminants of Concern (As, Pb, U and V metal) are not required to have MSDSs, Section 15 contains specific information on each metal's health hazard data. This material is available to all employees and is to be presented to all site workers as part of the project Hazard Communication Program. In addition, the RSP information on the radiological toxicity of uranium and its decay products is also incorporated into the project Hazard Communication Program in order to provide full coverage and comprehensive understanding of site hazards. Employees review Hazard Communication Standard criteria at annual refresher classes.

## **11.8 MSHA Certification**

24 hour MSHA training and/or 8 hour annual refresher training will be completed by all personnel working onsite, meaning a mine site or other project site.

## **12.0 MEDICAL SURVEILLANCE**

Personnel who have a potential for exposure to hazardous substances at the site must participate in a medical surveillance examination program. Site employees must have a current physician's statement (Physician's Written Opinion-PWO) to document medical eligibility to complete assigned tasks (OSHA 29 CFR 1910.120) including the ability to wear respiratory protection and other personal protective equipment.

### **12.1 Medical Examinations**

Each individual must have completed such an examination and/or an initial baseline examination within the last year prior to performing any work on the site covered by this HASP. The medical examinations for this project may include metals screening tests for arsenic, lead and uranium due to their presence in soil. Depending on the results of air sampling during the project, there may be additional metal tests to monitor personal exposure during the course of operations, as well as at the termination of the project. The contents of the basic medical examination are summarized in the Medical Surveillance Program.

All employee medical records are maintained in the medical consultant's office. The examining physician provides the employee with a letter summarizing his findings and recommendations. Each employee also has the right to inspect and copy his medical records.

The examining physician must provide the employer with a letter (Physician's Written Opinion-PWO) confirming the worker's fitness for work and ability to wear a respirator. A copy of this letter for all project workers will be kept onsite during all project site work. All contractors will certify that all their employees have successfully completed a physical examination by a qualified physician. The physical examinations must meet the requirements of 29 CFR 1910.120 and 29 CFR 1910.134. Contractors will supply copies of the medical examination certificate for each onsite employee.

### **12.2 Other Medical Examinations**

In addition to pre-employment, annual and exit physicals, personnel may be examined:

- At employee request after known or suspected exposure to toxic or hazardous materials, at the discretion of the Industrial Hygienist, the RSO, SHSO or Occupational Physician.
- Post-project physicals will be conducted at the conclusion of the project or sooner if an employee leaves the project prior to its termination or leaves the company after completion of the project. Employees who may be reassigned and leave the project within six months of having completed a medical exam will not be required to take another physical prior to a

- new work assignment (unless specific exposure concerns warrant additional tests).
- A medical test may be required when working at high elevations. This medical exam will be required to ensure HMOSP members are capable of doing physical work.

### **12.3 Medical Restriction**

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

### **12.4 Medical Records**

Medical and personal exposure monitoring records will be maintained according to the requirements of 29 CFR 1926.65 and will be kept for a minimum of 30 years. Confidentiality of employee medical records will be maintained. The physician's written medical opinion and any employee exposure data will be kept at the HMOSP main office. All other detailed medical records will be kept by the company medical consultant, Dr. Dennis Thrasher.

## **13.0 EMERGENCY RESPONSE**

A site emergency is a major event that has, or threatens to have, a detrimental physical impact on facilities, people and/or the environment and requires immediate action.

Emergencies can be grouped into three categories:

- Fire, leak, spill or release
- Natural (severe wind, flooding, dust storm, etc.)
- Medical

The Site Supervisor or the SHSO is responsible for initiating emergency response, whether related to excavation operations or public-related activities. The phone numbers of the police and fire departments, ambulance service, local hospital, and project representatives are provided per the specific job location. This sheet will be posted in the project office.

### **13.1 How to Respond to a Fire, Leak, Spill or Release**

If personnel discover a fire, leak, spill or release in the decommissioning work area:

- Report the emergency to the SHSO or Site Supervisor. Give your name, exact location and the nature of the emergency.
- Shut down all equipment
- Leave the area unless specifically trained to deal with the emergency at hand.

Access to hazardous or potentially hazardous areas must be controlled to reduce the probability of an incident or injury to field personnel, visitors and the public. FMRS controls access to this site. Hazardous or potentially hazardous areas will be marked using cordons, fences, barricades, traffic cones, posts or other methods depending on site conditions.

### **13.2 Fire**

HMOSP employees who have been trained in the use of portable fire extinguishers are permitted to use them to extinguish incipient fires only. All of the heavy equipment will be supplied with ABC multipurpose dry chemical fire extinguishers. ABC type fire extinguishers can also be found in each work area and will be available at each area if hot work is to be conducted.

If a fire is too large to handle with existing fire extinguishers, the local fire department should be summoned immediately. The PM or Site Supervisor will advise the incident commander of the location, nature and identification of any hazardous materials onsite.

If it is safe to do so, site personnel may:

- Use firefighting equipment available onsite to control or extinguish incipient stage fires only
- Remove or isolate flammable or other hazardous materials which may contribute to the fire
- Otherwise, immediate evacuation of the area is indicated.

In the event of an explosion, all personnel shall be evacuated and the fire department notified. No one shall re-enter the area until it has been cleared by an explosives safety person.

### **13.3 Natural Emergencies Contingency Plan**

Natural disasters may occur at the site due to weather. These include lightning and high winds.

- Lightning – Outdoor operations will be suspended when lightning is within a five second count of the site (i.e., the time difference between seeing a lightning strike and hearing thunder, or an audible alarm has been received by the portable lightning detector). High profile equipment operations shall be suspended when lightning is within 15 seconds of the site
- High winds – If high winds are forecast, the site should be cleared before the winds become hazardous. Workers should be instructed to go to an appropriate shelter
- If an evacuation is called, account for all persons before leaving the site.
- Notify the PM of any work excessive stoppage due to weather conditions (i.e. high winds, lightning, etc.)
- Inclement weather conditions may cause a work stoppage. Notify the PM or Superintendent of any work stoppage.

### **13.4 Medical Emergencies**

The onsite SHSO and/or Site Supervisor will be trained in CPR and First Aid and shall have First Aid Kits for use in a medical emergency. First Aid Kit(s) will be located at the active work location. Portable Eye wash stations will also be available at the active work location. Onsite personnel who have a basic knowledge of first aid will assist the SHSO or Site Supervisor. For medical emergencies that are life threatening, the appropriate community emergency services will be mobilized.

#### **13.4.1 How to Respond to a Medical Emergency**

First-aid trained personnel within the Exclusion Zone, regardless of level of PPE, will bring the injured person out of the Exclusion Zone, bypassing the CRZ (if applicable). The injured person will be ready at the CRZ for immediate evacuation by emergency personnel or local ambulance. The hospital shall be informed that the worker was not decontaminated and shall be provided a listing of site contaminants by the SHSO or Site Supervisor (if applicable).

For personnel with less serious injuries, the SHSO or Site Supervisor is responsible for providing first aid care. The injured employee will be stabilized as much as possible within the Exclusion Zone (if applicable). Emergency response personnel will enter the Exclusion Zone (if applicable) in appropriate PPE to conduct first aid and will remove the injured person for appropriate medical attention through the decontamination procedure (if applicable).

In the event an injury or illness requires more than first aid treatment, the SHSO or Site Supervisor will accompany the injured person to the medical facility and will remain with the person until release or admittance is determined. The escort will relay all appropriate medical information to the Project Manager.

### 13.5 Employee Training for Site Evacuation

Employees must be instructed in the site-specific aspects of emergency evacuation. Site escape routes and assembly areas will be established by the SHSO or Site Supervisor upon arrival to the site and reviewed during the pre-entry briefing with all staff. Onsite refresher or updated training is required anytime escape routes or procedures are modified or personnel assignments are changed.

#### 13.5.1 Employee Accounting Method after Site Evacuation

The SHSO or Site Supervisor is responsible for identifying all onsite personnel located on the work site at all times. The log-in and log-out book maintained at the security office of the facility will be used by the SHSO or Site Supervisor to verify successful evacuation of all project employees.

### 13.6 Alarm Systems/Emergency Signals

An emergency communication system must be in effect at all sites. The most simple and effective emergency communication system in many situations will be direct verbal communications. Each site must be assessed at the time of initial site activity and periodically as the work progresses.

Verbal communications must be supplemented anytime voices cannot be clearly perceived above ambient noise levels (i.e., noise from heavy equipment; backhoes, loaders, etc.) and anytime a clear line-of-sight cannot be easily maintained among all personnel because of distance, terrain or other obstructions.

### 13.7 Accident Reporting and Investigation

Any incident resulting in injury, illness or property damage requires an accident investigation and report. All incidents, including near miss and first aid cases must be reported immediately to the PM, Site Supervisor and the SHSO. The investigation should be conducted as soon as emergency conditions are under control. The purpose of the investigation is not to attribute blame but to determine the pertinent facts so that repeat occurrences can be avoided. An accident investigation form is available electronically and can be accessed for entry of the pertinent facts by the SHSO or Site Supervisor. For serious injuries or illnesses, dial **911** so the patient can be transported to the hospital. Other Emergency Numbers are listed in **Table 1** below.

**Table 1: Emergency Telephone Numbers**

Agency	Telephone Number
Emergency	911
Police	911
Fire Department	911
Ambulance	911
Poison Control Center	800-222-1222
National Response Center (NRC)	800-424-8802
Health and Safety Manager (Phillip Seaman)	520-678-5059
Sr. Industrial Hygienist (William Hetrick)	520-282-0149
Project Manager (Dave Paszkiet)	520-730-9271
Sr. Supervisor (Danny Hicks)	520-405-2256



## **14.0 SPILL PREVENTION, CONTROL AND CONTAINMENT**

Spills occurring onsite, whether liquid or solid, will be reported promptly to the Project Manager, Site Supervisor, the SHSO and the RSO. While it is not anticipated, due to the nature of this project, that any reportable quantities of solid or liquid materials will be released, the following section describes management of waste spills and preventive measures.

Fluids such as diesel, oil or fuel used at the site shall be stored in one central location. Secondary containment or double walled tanks shall be used to minimize the risk of leaks, spills or releases during use or storage. Transport of fuels from this area shall be in accordance with all federal, state and local laws and shall be in appropriate containers or vehicles. Containers or vehicles transporting fuel shall be labeled and placarded accordingly to identify the substance and its characteristic.

Material information sheets and/or MSDS shall be onsite in a central location for all substances stored onsite and shall be consulted to identify the appropriate cleanup and disposal measures. All tanks or containers storing substances shall have secondary measures for confinement sufficient to contain the volume of material stored. In the event of a spill, control measures shall be implemented. Following a spill or liquid release, the procedures in Section 14.1 will be implemented.

For small, incidental spills or releases (i.e., fuel or oil leaks), the clean-up shall be done promptly. A small spill implies no injury to any personnel or the public and can be cleaned up quickly and easily.

For large spills, immediately remove any persons who may have been contaminated and attend to first-aid needs. If possible, the source of the spill shall be stopped and the appropriate personnel notified.

Where site personnel can provide some level of containment without endangerment, they may do so. Actions might include the following:

- Damming or berming of down gradient pathways to contain spill liquids
- Using onsite absorbent materials to immobilize liquids
- Restricting access to the spill area. Command of the incident will be given to the local emergency response agency upon their arrival. Final clean-up procedures will be determined by the PM in conjunction with the Site Supervisor and appropriate regulatory personnel

### **14.1 Spill/Leak/Release Response**

Any solids spilled during the removal action will be promptly recovered and replaced into the container they came from if possible. If container is damaged, the spill will be contained with local soil or a spill control kit and the following procedures will then be implemented:

- Notify the PM and Site Supervisor immediately
- Isolate the spill area and control entry to the area quarantined
- Only personnel in the proper PPE will be allowed to enter the area
- Keep all traffic away from the spill
- Use a water fog to suppress vapors, fumes, dust or mist if imminent release from the site is apparent
- Remove and stockpile or containerize the waste immediately or as directed by the Site Supervisor in coordination with the PM

Any liquid spilled during site activities will be promptly contained and a spill control kit will be utilized to help contain and clean up the spill. The following procedures will be implemented to reduce and eliminate any hazards:

- When a spill has been detected, all personnel and equipment will be moved away from the spill if this can be done safely and not cause any additional hazards
- Attempt to find and eliminate the source of the spill, only if the worker is properly protected and can safely do this activity
- By using the appropriate equipment, i.e. absorbent materials, fire extinguishers, PPE; the worker will attempt to contain the spill and clean up the hazards created by the spill
- The materials used to clean up the spill will be placed in the appropriate containers and those containers will be properly disposed of according to regulatory requirements
- If the worker is not able to control the spill situation, then the worker shall immediately contact the PM. The PM shall contact the appropriate agencies to help handle the spill.

## **15.0 SITE SPECIFIC INFORMATION**

SITE NAME: Ruby Mine

SITE LOCATION: Navajo Reservation, near Thoreau, NM

PLAN DATE: May 10,2013

REVISION DATE: N/A

This Site Specific Health & Safety Plan addresses specific activities and operations proposed to be conducted at the Ruby Mine HMOSP Closure Project.

This Site Specific information has been developed from the latest available information. Revisions and alterations to this plan may become necessary as further information, (i.e., environmental sampling results, changes in site conditions, changes in scope of work, etc.), is developed or becomes available. Any proposed changes must be approved by the Project Manager and Industrial Hygienist for HMOSP. All on-site personnel are required to review and comply with this Health and Safety Plan. It is the responsibility of the Project Manager to ensure this plan is implemented.

## 15.1 Site History

### 15.1.1 Nature of Site

- |                                      |                                     |  |
|--------------------------------------|-------------------------------------|--|
| <input type="checkbox"/> INDUSTRIAL  | <input type="checkbox"/> COMMERCIAL | <input type="checkbox"/> MILITARY / DOD                              |
| <input type="checkbox"/> RESIDENTIAL | <input type="checkbox"/> MINE SITE  | <input type="checkbox"/> GOVERNMENT                                  |
| <input type="checkbox"/> URBAN       | <input type="checkbox"/> RURAL      | <input checked="" type="checkbox"/> OTHER: <u>Navajo Reservation</u> |

### 15.1.2 Current Use of Site

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> MANUFACTURING    | <input type="checkbox"/> ACTIVE MINE SITE | <input type="checkbox"/> INACTIVE                            |
| <input type="checkbox"/> LANDFILL         | <input type="checkbox"/> COMMERCIAL       | <input type="checkbox"/> MAINTENANCE                         |
| <input type="checkbox"/> PRODUCTION       | <input type="checkbox"/> REFINERY         | <input type="checkbox"/> TREATMENT STORAGE DISPOSAL FACILITY |
| <input checked="" type="checkbox"/> OTHER |   |  |

### 15.1.3 Scope of Work

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> SITE EVALUATION | <input type="checkbox"/> RECONNAISSANCE | <input checked="" type="checkbox"/> CLOSURE WORK |
| <input type="checkbox"/> MONITORING      | <input type="checkbox"/> OTHER: _____   |  |

### 15.1.4 Work Ordered By

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> CLIENT <u>Stu Brown</u> | <input type="checkbox"/> AGENCY (SPECIFY): _____ |
|---|--|

### 15.1.5 Nature of Project

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> PRIVATE PROJECT | <input type="checkbox"/> PUBLIC PROJECT | <input checked="" type="checkbox"/> VOLUNTARY CLOSURE |
|--|---|---|

## 15.2 Site Description

### 15.2.1 Detailed Site History/Description

Background:

The Ruby Mine site is located on Navajo Reservation land that was once controlled by an FCX company. Several mine features are located on the land that require closure to prevent public access to the features.

### 15.2.2 General Site Topography

FLAT       HILLY       MARSHLAND       DESERT       HEAVY VEGETATION

### 15.2.3 Bodies of Water Adjacent to Work Site

STREAM       RIVER       POND       OTHER: \_\_\_\_\_  
 NAME: \_\_\_\_\_       N/A

### 15.2.4 Approximate Site Size

Sites where closure work will take place totals approx 1 acre.

### 15.2.5 Unusual Site Features

None.

### 15.2.6 Properties or Operations Abutting

None.

### 15.2.7 Current Site Activities

HMOSP Operations: None.

Client Operations: None.

Site Contractors: None.

Miscellaneous: Residential houses are located within a mile of the site.

### 15.2.8 Overhead Electrical Hazards

Overhead electrical hazards will be identified in the field.

### 15.2.9 Underground Utility Hazards

Utilities will be identified in the field.

### 15.2.10 Safe-Work Practice Compliance

HMOSP personnel are required to follow Policy & Procedures at all times.



### 15.3 Contaminants and Waste

Contaminants and waste will be identified in the field.

#### 15.3.1 Waste Type

LIQUID                       SOLID                       GAS                       SLUDGE                       N/A

#### 15.3.2 Chemicals of Concern

#### 15.3.3 Exposure Limits

Chemical Name	ACGIH		OSHA		IDLH
	TLV	STEL	PEL	STEL	
N/A					

#### 15.3.4 Chemicals Used On-Site

Summarize the chemicals that will be brought to the site and used by personnel. (Include each product that will be on site, e.g. the decontamination solution, oil/grease for equipment maintenance, etc.). Attach appropriate MSDS.

Chemical Name	Task Used For	Quantity of Chemical	Solution Concentration
Diesel Fuel (Heavy Equipment)	Equipment		100%
MDI (Part A and B)	Polyurethane Foam Sealant		

### 15.4 Response Personnel & Emergency Numbers

(INDICATE LOCATION)

City of Thoreau	Fire Department	911
City of Thoreau	Ambulance Service	911
City of Thoreau	Police Department	911
City of Gallup	State Police	911

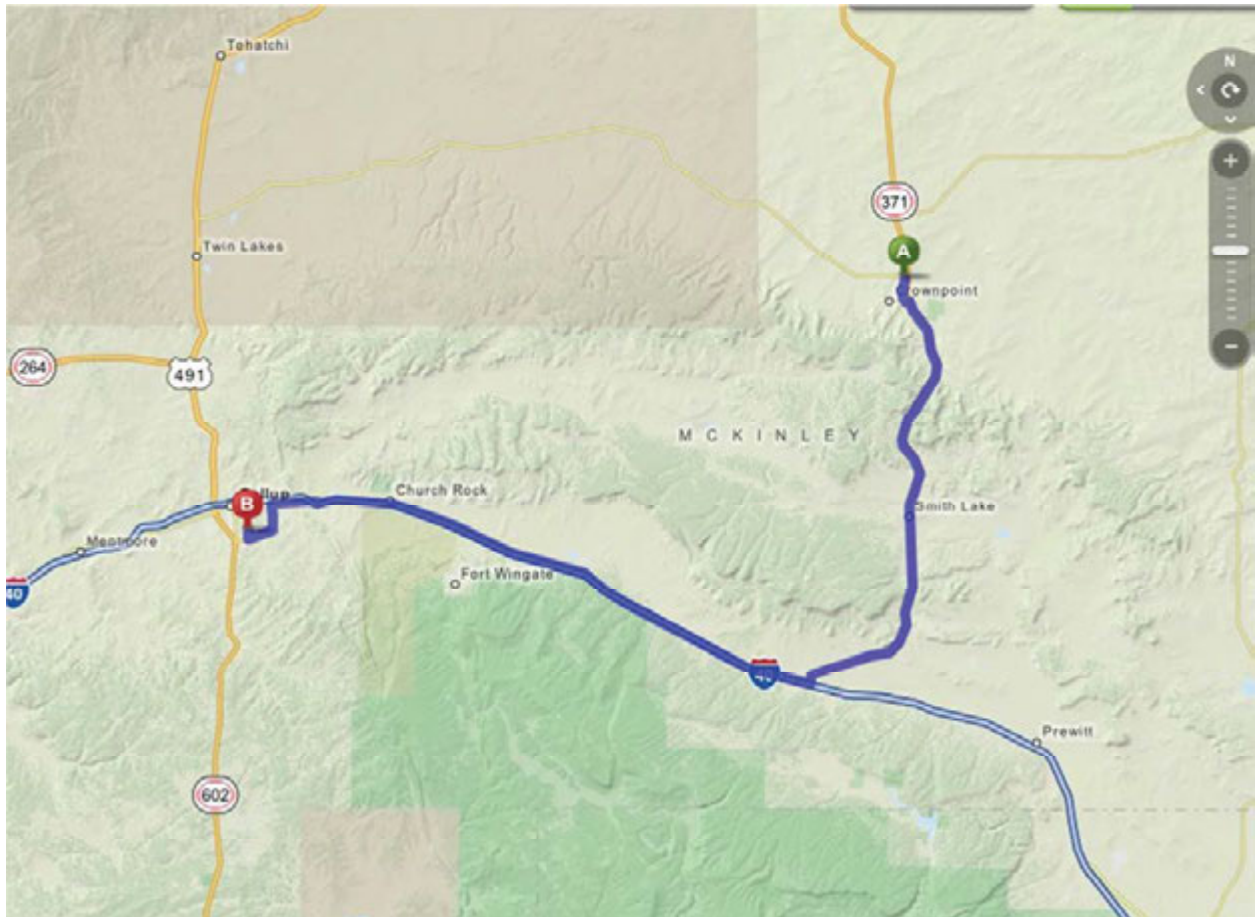
**HOSPITAL:** Rehoboth Hospital

**ADDRESS:** 1901 Redrock Dr, Gallup, NM 87301

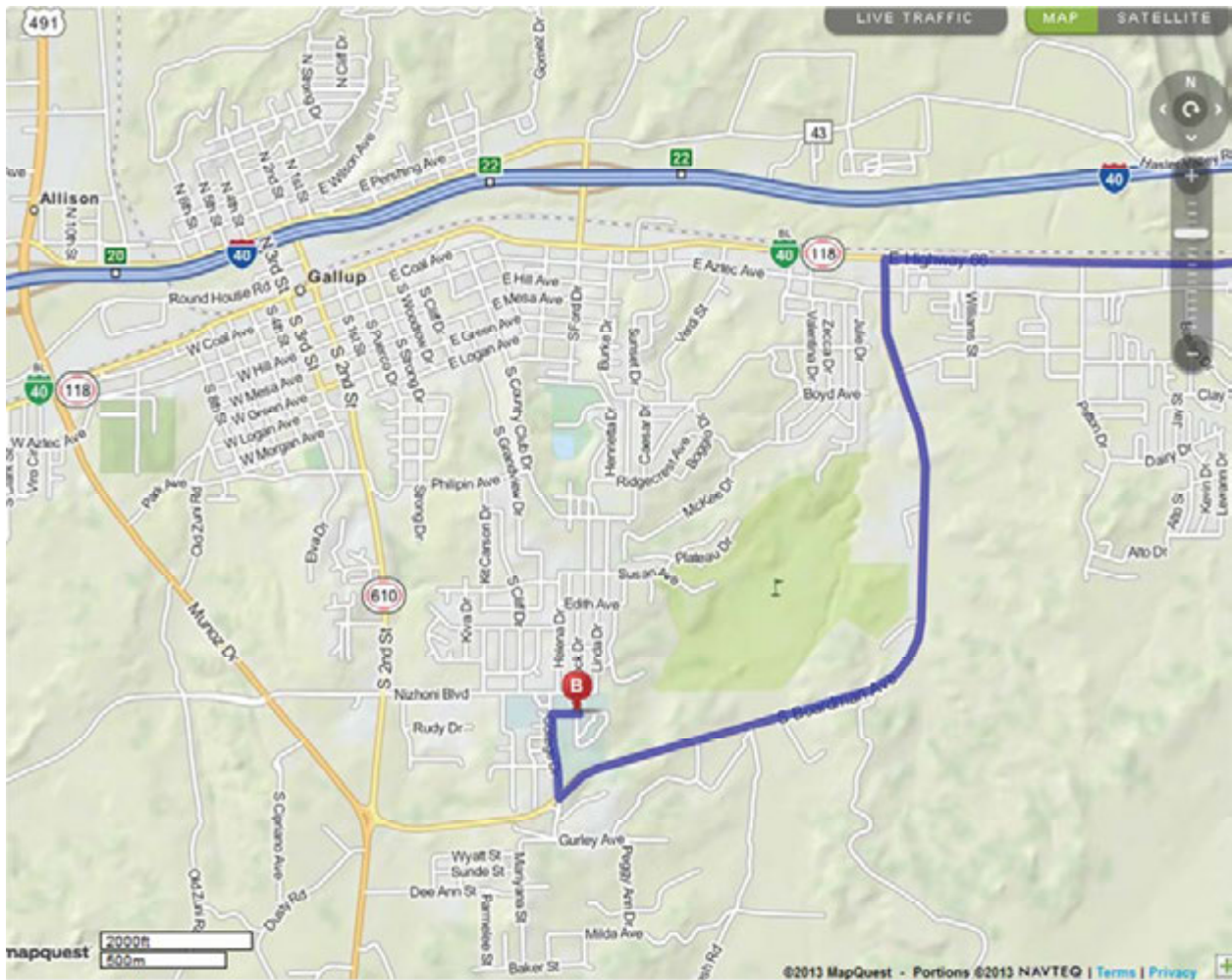
**PHONE:** (505)863-7000

**MAP:**

**Overview From Work Site Area to Rehoboth Hospital**















## Close Up of Rehoboth Hospital Location in Gallup



### DRIVING DIRECTIONS TO NEAREST HOSPITAL

- |       |                           |                    |
|-------|---------------------------|--------------------|
| ●     | 1. Start out going south. | 0.4 mi<br>1 minute |
| <hr/> |                           |                    |
| ↙     | 2. Turn slight right.     | 0.2 mi             |

	3. Turn slight left.	0.6 mi 1 minute
	4. Turn left onto Chaco Blvd.	0.2 mi
 	5. Turn right onto NM-371.	24.0 mi 28 minutes
 	6. Merge onto I-40 W. <ul style="list-style-type: none"><li>If you reach Poor Farm Rd you've gone a little too far</li></ul>	26.8 mi 22 minutes
	7. Take the I-40-BL exit, EXIT 26, toward E. Gallup.	0.4 mi
	8. Keep left to take the ramp toward Gallup.	0.03 mi
 	9. Turn left onto NM-118 / E Highway 66. <ul style="list-style-type: none"><li>GIANT #6075 is on the corner</li></ul>	2.3 mi 3 minutes
 	10. Turn left onto S Boardman Ave / NM-564. <ul style="list-style-type: none"><li>S Boardman Ave is just past Mine Run St</li><li>McDonald's is on the corner</li><li>If you reach S Valentina Dr you've gone about 0.2 miles too far</li></ul>	2.6 mi 4 minutes





11. Turn right onto College Dr.

0.3 mi

- College Dr is 0.6 miles past Catalpa Wash Rd
- If you reach NM-602 you've gone about 0.6 miles too far

1 minute



12. Turn right onto Hospital Dr.

0.09 mi

- Hospital Dr is just past Government Cir
- If you reach Nizhoni Blvd you've gone a little too far



13. Take the 1st right onto Redrock Dr.

0.01 mi

- If you reach Hospital Dr you've gone about 0.4 miles too far



14. 1901 REDROCK DR is on the left.

- If you reach College Dr you've gone about 0.4 miles too far

Total Travel Estimate: **57.90 miles - about 1 hour 4 minutes**

### 15.4.1 Operations Contacts

#### **PROJECT MANAGER:**

**NAME:** Dave Paszkiet

**LOCATION:** Oro Valley, AZ

**CELL:** (520) 730-9271

**OFFICE:** (520)498-6550

#### **HEALTH AND SAFETY CONTACT**

**NAME:** Phil Seaman

**LOCATION:** Oro Valley, AZ

**CELL:** (520) 678-5059

**OFFICE:** (520)498-6549

## **INDUSTRIAL HYGIENE CONTACT**

**NAME: Bill Hetrick**

**LOCATION: Oro Valley, AZ**

**CELL: (520) 282-0149**

**OFFICE: (520) 498-6561**

### **15.4.2 Key Personnel and Emergency Numbers**

**NAME: Stu Brown**

**TITLE: Sr. Dir. Remediation Projects**

**COMPANY: Freeport-McMoRan**

**CELL: (602)448-0972**

**EMAIL: Stuart\_Brown@fmi.com**

**NAME: Danny Hicks**

**TITLE: HMOSP Sr. Supervisor**

**COMPANY: Freeport-McMoRan**

**CELL: (520) 405-2256**

**EMAIL: Danny\_Hicks@fmi.com**

**NAME: Sarah Dahlin**

**TITLE: Mine Engineer II**

**COMPANY: Freeport-McMoRan**

**PHONE: (520) 647-1595**

**EMAIL: Sarah\_Dahlin@fmi.com**

### **15.4.3 Regulatory Agency Contacts**

**FEDERAL CONTACT: None.**

**STATE CONTACT: None.**

### 15.4.4 Daily Safety Meeting

A Daily Safety Meeting is performed each morning that the crew reports for work. During this meeting all relevant subjects pertaining to tasks at hand as well as overall project safety information is relayed.

### 15.5 Site Health and Safety Controls

The following tasks have Job Hazard Analyses in **Appendix D** and they have been developed to identify, communicate, and minimize the risk of exposure to anticipated chemical, physical and biological hazards on the job site. These evaluations identify also recommends control measures to minimize recognized hazards. Additional information on hazards should be gathered during site activities and can be added to this document to supplement this plan.




	TASK	LEVEL
1	MOBILIZATION / TAILGATE SAFETY MEETING / SITE SETUP	D
2	CONSTRUCTION OF ADIT FRAMEWORK TO SUPPORT POLYURETHANE FILLER	D
3	MIXING OF MDI AND ACCELERATOR RESIN	D
4	POURING OF POLYURETHANE AND SET UP (HARDENING OF FOAM)	D
5	CONSTRUCTION OF FINISHED FACE/BACKFILL (USING LOCAL MATERIALS)	D
6	SITE CLEAN-UP/DEBRIS REMOVAL/DECONTAMINATION	D
7	DEMOBILIZATION	D

The PPE Hazard Assessment to be conducted is to be completed using the following guideline. Additional information or selection of PPE not addressed in the hazard assessment shall be entered in this section.




## PPE HAZARD ASSESSMENT




DATE REVIEWED WITH EMPLOYEE(S): \_\_\_\_\_

COMPLETED BY: \_\_\_\_\_

	<b>Mechanical/Physical Hazards</b>	<b>Chemical Hazards</b>	<b>Biological/Environmental Hazards</b>	<b>Minimum PPE Required</b>
	<input type="checkbox"/> Cutting <input type="checkbox"/> Sawing <input type="checkbox"/> Drilling <input type="checkbox"/> Sanding <input type="checkbox"/> Grinding <input type="checkbox"/> Hammering <input type="checkbox"/> Chopping <input type="checkbox"/> Puncture <input type="checkbox"/> Welding-UV light <input type="checkbox"/> Intense Sunlight <input type="checkbox"/> Compressed Air <input type="checkbox"/> Airborne Dust-Flying particulate	<input type="checkbox"/> Chemical Splash, contact <input type="checkbox"/> Gas, vapors, & fumes <input type="checkbox"/> Dust particles <input type="checkbox"/> Objects under pressure <input type="checkbox"/> Cryogenic Burn	<input type="checkbox"/> Blood/body fluids <input type="checkbox"/> Harmful bacteria, virus <input type="checkbox"/> Other Infectious Substance	<input checked="" type="checkbox"/> Safety Glasses with side shields <input type="checkbox"/> Safety Goggles <input type="checkbox"/> Prescription safety glasses/side shields <input type="checkbox"/> Face shield <input type="checkbox"/> Welding Goggles <input type="checkbox"/> Welding Helmet w/tinted lens <input type="checkbox"/> Full Face Respirator <input type="checkbox"/> None
	<b>Mechanical/Physical Hazards</b>	<b>Chemical Hazards</b>	<b>Biological/Environmental Hazards</b>	<b>Minimum PPE Required</b>
	<input type="checkbox"/> Falling objects (Top Impact) <input type="checkbox"/> Electrical shock <input type="checkbox"/> Impact	<input type="checkbox"/> Dust particles, debris <input type="checkbox"/> Chemical Contamination	<input type="checkbox"/> Heat Stress <input type="checkbox"/> Cold Stress	<input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Winter hard hat liners <input type="checkbox"/> Hot Weather Ventilated Hard Hat
	<b>Mechanical/Physical Hazards</b>	<b>Chemical Hazards</b>	<b>Biological/Environmental Hazards</b>	<b>Minimum PPE Required</b>
	<input type="checkbox"/> Impact / Falling objects <input type="checkbox"/> Electrical <input type="checkbox"/> Puncture <input type="checkbox"/> Work with rebar <input type="checkbox"/> Slippery/Wet surface/oil/grease <input type="checkbox"/> Sharp objects <input type="checkbox"/> Power tool(s) <input type="checkbox"/> Crushing/Compression objects <input type="checkbox"/> Welding/Sparks <input type="checkbox"/> Pressure Washing	<input type="checkbox"/> Chemical Splash, contact <input type="checkbox"/> Chemical contamination <input type="checkbox"/> Acid/base damage	<input type="checkbox"/> Heat Stress <input type="checkbox"/> Cold Stress <input type="checkbox"/> Dirt, Debris transfer <input type="checkbox"/> Working on rocky or slippery soils	<input checked="" type="checkbox"/> Steel-toe 6'' high safety boot <input type="checkbox"/> Steel-toe 6'' high with metatarsal guard <input type="checkbox"/> Steel-shank required <input type="checkbox"/> PVC / Latex Over-boot ("Nuke" boot) <input type="checkbox"/> PVC Steel-toe Boot-16'' <input type="checkbox"/> Neoprene Steel-toe Boot-16'' <input type="checkbox"/> Boot/shoe Cover (tyvek-disposable)



	<p><b>Mechanical/Physical Hazards</b></p> <p><input type="checkbox"/> Material handling <input type="checkbox"/> Electrical shock</p> <p><input type="checkbox"/> Thermal burn <input type="checkbox"/> Pinch/crush</p> <p><input type="checkbox"/> Impact/bruise <input type="checkbox"/> Tools (misuse)</p> <p><input type="checkbox"/> Utility Knives</p> <p><input type="checkbox"/> Welding/Sparks</p> <p><input type="checkbox"/> Skin Puncture (high pressure fluid/gas)</p> <p><input type="checkbox"/> Skin Puncture (mechanical injury)</p>	<p><b>Chemical Hazards</b></p> <p><input type="checkbox"/> Chemical Splash, contact</p> <p><input type="checkbox"/> Chemical Burn</p> <p><input type="checkbox"/> Hot Liquids/Steam</p> <p><input type="checkbox"/> Cold Objects/cryogenics</p> <p><input type="checkbox"/> Chemical under pressure</p> <p><input type="checkbox"/> Skin Penetration</p> <p><input type="checkbox"/> Skin Sensitizers-</p> <p>MDI, TDI</p>	<p><b>Biological/Environmental Hazards</b></p> <p><input type="checkbox"/> Heat Stress</p> <p><input type="checkbox"/> Cold Stress</p> <p><input type="checkbox"/> Dirt, Debris</p> <p><input type="checkbox"/> Blood/body fluids</p> <p><input type="checkbox"/> Other Infectious Substance</p>	<p><b>Minimum PPE Required</b></p> <p><input type="checkbox"/> Cotton, inner <input type="checkbox"/> Cotton, outer</p> <p><input type="checkbox"/> Nitrile, inner <input type="checkbox"/> Nitrile, outer</p> <p><input type="checkbox"/> Canvas <input checked="" type="checkbox"/> Leather</p> <p><input type="checkbox"/> Polar, insulated <input type="checkbox"/> Kevlar</p> <p><input type="checkbox"/> Neoprene <input type="checkbox"/> Nomex</p> <p><input type="checkbox"/> Rubber <input type="checkbox"/> Latex</p> <p><input type="checkbox"/> Silver Shields</p> <p><input type="checkbox"/> Other _____</p>
	<p><b>Mechanical/Physical Hazards</b></p> <p><input type="checkbox"/> Cuts, abrasions</p> <p><input type="checkbox"/> Electrical shock</p> <p><input type="checkbox"/> Puncture</p> <p><input type="checkbox"/> Thermal burn</p> <p><input type="checkbox"/> Cryogenic Burn</p> <p><input type="checkbox"/> Impact/bruise</p> <p><input type="checkbox"/> Tools</p>	<p><b>Chemical Hazards</b></p> <p><input type="checkbox"/> Chemical contact</p> <p><input type="checkbox"/> Particulate contact</p> <p><input type="checkbox"/> Fluids under pressure</p> <p><input type="checkbox"/> Gases under pressure</p>	<p><b>Biological/Environmental Hazards</b></p> <p><input type="checkbox"/> Heat Stress</p> <p><input type="checkbox"/> Cold Stress</p> <p><input type="checkbox"/> Dirt, Debris</p> <p><input type="checkbox"/> Blood, body fluids (First Aid)</p> <p><input type="checkbox"/> Harmful bacteria, viruses</p> <p><input type="checkbox"/> Other Infectious Substances</p> <p><input type="checkbox"/> Animal/Insect/Reptile contact</p>	<p><b>Minimum PPE Required</b></p> <p><input type="checkbox"/> Work Uniform, Cotton</p> <p><input type="checkbox"/> Work Uniform, Flame Retardant</p> <p><input type="checkbox"/> Nomex <input type="checkbox"/> Tyvek <input type="checkbox"/> Saranex</p> <p><input type="checkbox"/> Tychem</p> <p><input type="checkbox"/> Full body, no hood</p> <p><input type="checkbox"/> Full body with hood</p> <p><input type="checkbox"/> Full body with hood and boot cover</p> <p><input type="checkbox"/> Arc flash Protective Clothing</p> <p><input type="checkbox"/> Level A; <input type="checkbox"/> Level B; <input type="checkbox"/> Level C</p> <p><input type="checkbox"/> Level D</p> <p><input type="checkbox"/> Other: _____</p>
	<p><b>Mechanical/Physical Hazards</b></p> <p><input type="checkbox"/> Vehicle Use</p> <p><input type="checkbox"/> Heavy Equipment Operations</p> <p><input type="checkbox"/> Field Equipment Operations</p> <p><input type="checkbox"/> Compressors/Generators</p> <p><input type="checkbox"/> Maintenance tasks</p> <p><input type="checkbox"/> Power tools</p>	<p><b>Chemical Hazards</b></p> <p><input type="checkbox"/> Ototoxic chemicals:</p> <p>(Toluene, mercury, CO)</p>	<p><b>Biological/Environmental Hazards</b></p> <p><input type="checkbox"/> Dirt, debris, chemicals, grease, oils</p>	<p><b>Minimum PPE Required</b></p> <p><input checked="" type="checkbox"/> Ear plugs - disposable</p> <p><input type="checkbox"/> Ear muffs</p> <p><input type="checkbox"/> Both Ear Plugs and Ear Muffs</p>

	<p><b>Mechanical/Physical Hazards</b></p> <input type="checkbox"/> Heavy Equipment operations <input type="checkbox"/> Vehicle and foot traffic interaction	<p><b>Chemical Hazards</b></p> <input type="checkbox"/> Chemical contact <input type="checkbox"/> Particulate contact <input type="checkbox"/> Oil/Grease/Liquids	<p><b>Biological/Environmental Hazards</b></p> <input type="checkbox"/> Heat Stress <input type="checkbox"/> Poor visual recognition of personnel	<p><b>Minimum PPE Required</b></p> <input checked="" type="checkbox"/> Reflective safety vest <input type="checkbox"/> Cooling vest for hot environments <input checked="" type="checkbox"/> White shirts when Africanized bees are present
	<p><b>Mechanical/Physical Hazards</b></p> <input type="checkbox"/> Equipment Operations, Irritant dust <input type="checkbox"/> Particulate from Welding/Cutting <input type="checkbox"/> Chemical splash potential (eyes) <input type="checkbox"/> Compressed Air Use <input type="checkbox"/> Abrasive blasting <input type="checkbox"/> Concrete demolition	<p><b>Chemical Hazards</b></p> <input type="checkbox"/> Solvent vapors <input type="checkbox"/> Gases <input type="checkbox"/> Toxic Particulate <input type="checkbox"/> Metals, welding fume <input type="checkbox"/> Aerosols and mists <input type="checkbox"/> Nuisance dust <input type="checkbox"/> Respiratory Sensitizers	<p><b>Biological/Environmental Hazards</b></p> <input type="checkbox"/> Blood, body fluids (First Aid) <input type="checkbox"/> Harmful bacteria, virus <input type="checkbox"/> Other Infectious Substances <input type="checkbox"/> Animal carcasses, Hanta Virus	<p><b>Minimum PPE Required</b></p> <input type="checkbox"/> Half-face respirator-Dual Cartridge <input type="checkbox"/> Full-face respirator-Dual Cartridge <input type="checkbox"/> SCBA-45 minute air supply <input type="checkbox"/> Supplied Airline Respirator (SAR) <input type="checkbox"/> Powered Air Purifying (PAPR) <input type="checkbox"/> OV/AG/P100 (Combo Cartridge) <input type="checkbox"/> P100 Cartridge (HEPA) <input type="checkbox"/> Nuisance dust mask (disposable) <input type="checkbox"/> Other: _____
	<p><b>Mechanical/Physical Hazards</b></p> <input type="checkbox"/> Elevated working surfaces/falls <input type="checkbox"/> Body Positioning, body restraint <input type="checkbox"/> Ladder climbing, vertical lifelines	<p><b>Chemical Hazards</b></p> <input type="checkbox"/> Chemical contact <input type="checkbox"/> Particulate contact <input type="checkbox"/> Oil/Grease/Liquids	<p><b>Biological/Environmental Hazards</b></p> <input type="checkbox"/> Slippery elevated working surfaces: <input type="checkbox"/> Dust <input type="checkbox"/> Chemicals <input type="checkbox"/> Grease <input type="checkbox"/> Oils, <input type="checkbox"/> Water	<p><b>Minimum PPE Required</b></p> <input type="checkbox"/> Full-body Harness with Lanyard <input type="checkbox"/> Restraint lanyard, body positioning <input type="checkbox"/> Ladder climbing Equipment <input checked="" type="checkbox"/> Aztec travel restraint

## 15.6 Traffic Control On-Site

The purpose of this section is to ensure that all traffic is controlled in such a manner that safe navigation into, through, and out of the work site and surrounding community is accomplished. The traffic flow generated due to site work activities should not generate unwanted emissions, including dust.

The speed limit for UTV operation will not exceed 15 mph on off-road routes.

The speed limit for UTV operation will follow posted limits on public roads.

### **15.6.1 Transportation Equipment**

The following equipment is determined to be necessary for site activities:

- 446 Backhoe with extended boom, or equivalent machinery
- 2K Water truck

All vehicles may be thoroughly inspected before use on the site.

### **15.6.2 Contractor Vehicles**

All contractor employee vehicles will be parked in designated areas.

### **15.6.3 Vehicle Decontamination Procedures**

Vehicles will be cleaned as needed.

### **15.6.4 Vehicle Traffic/Transportation Route**

The optimal transportation route will be determined onsite, and is subject to change due to site conditions.

### **15.6.5 High-Visibility Clothing**

Employees (operating UTVs or not) shall wear orange, strong yellow-green or fluorescent versions of colored warning garments such as vests, jackets, or shirts unless Africanized bees are present. If bees are present, HMOSP team members will follow guidelines outlined in the White Shirt Only Policy SOP(04-09). Rainwear, when worn, shall be orange, strong yellow-green, or yellow.

## **15.7 Site Maps**

Where applicable, maps and photos may be used to identify the following:

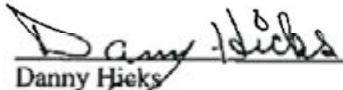
1. Anticipated Work Zone locations (i.e., Restricted Area)
2. Location of all above/below ground utilities
3. Any unusual site features (i.e., cliffs, ditches, streams, etc.)
4. If applicable, locations where photos of site were taken

## RUBY MINE PLAN APPROVAL AGREEMENT

The following individuals have reviewed the site-specific Health and Safety Plan for the HMOSP Mine Closure Projects. They are responsible for implementing and enforcing the procedures and items covered by this plan.

  
\_\_\_\_\_  
Dave Paszkiet  
Project Manager, Engineering

05/08/2013  
Date

  
\_\_\_\_\_  
Danny Hicks  
Sr. Site Supervisor

5-8-13  
Date

  
\_\_\_\_\_  
Lance Haverland  
Site Supervisor

5-8-13  
Date



## 16.0 RADIATION SAFETY PLAN

This section will include a Radiation Safety Plan when applicable.

## 17.0 CHEMICALS USED ONSITE AND MSDS

**Table 2: Chemicals Used Onsite**

CHEMICAL NAME	TASK USED FOR	QUANTITY OF CHEMICAL	SOLUTION CONCENTRATION
<b>MDI (Part A and B)</b>	<b>Polyurethane Foam Sealant</b>	Varies	
<b>GASOLINE</b>	<b>Polaris Ranger</b>	≤ 5gallons	100%

The following MSDS are available within this HASP:

- Chevron regular Unleaded Gasoline
- Foam Concepts – MDI: FC ES 24-005A
- Foam Concepts – MDI: FC ES 24-005R

# Material Safety Data Sheet

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

### CHEVRON REGULAR UNLEADED GASOLINE

**Product Number(s):** CPS201000 [See Section 16 for Additional Product Numbers]

**Synonyms:** Calco Regular Unleaded Gasoline

#### Company Identification

Chevron Products Company  
Marketing, MSDS Coordinator  
6001 Bollinger Canyon Road  
San Ramon, CA 94583  
United States of America

#### Transportation Emergency Response

CHEMTREC: (800) 424-9300 or (703) 527-3887

#### Health Emergency

ChevronTexaco Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

#### Product Information

Technical Information: (510) 242-5357

SPECIAL NOTES: This MSDS applies to: Federal Reformulated Gasoline, California Reformulated Gasoline, Wintertime Oxygenated Gasoline, Low RVP Gasoline and Conventional Gasoline.

## SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Gasoline	86290-81-5	100 %volume
Benzene	71-43-2	0.1 - 4.9 %volume
Ethyl benzene	100-41-4	0.1 - 3 %volume
Naphthalene	91-20-3	0.1 - 2 %volume
Ethanol	64-17-5	0 - 10 %volume
Methyl tert-butyl ether (MTBE)	1634-04-4	0 - 15 %volume
Tertiary amyl methyl ether (TAME)	994-05-8	0 - 17 %volume
Ethyl tert-butyl ether (ETBE)	637-92-3	0 - 18 %volume

Motor gasoline is considered a mixture by EPA under the Toxic Substances Control Act (TSCA). The refinery streams used to blend motor gasoline are all on the TSCA Chemical Substances Inventory. The appropriate CAS number for refinery blended motor gasoline is 86290-81-5. The product specifications of motor gasoline sold in your area will depend on applicable Federal and State regulations.

## SECTION 3 HAZARDS IDENTIFICATION

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### ***EMERGENCY OVERVIEW***

- EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE
- HARMFUL OR FATAL IF SWALLOWED - MAY CAUSE LUNG DAMAGE IF SWALLOWED
- VAPOR HARMFUL
- CAUSES SKIN IRRITATION
- CAUSES EYE IRRITATION
- LONG-TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN LABORATORY ANIMALS
- KEEP OUT OF REACH OF CHILDREN
- TOXIC TO AQUATIC ORGANISMS

\*\*\*\*\*  
\*\*\*\*\*

### **IMMEDIATE HEALTH EFFECTS**

**Eye:** Contact with the eyes causes irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision.

**Skin:** Contact with the skin causes irritation. Skin contact may cause drying or defatting of the skin. Symptoms may include pain, itching, discoloration, swelling, and blistering. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.

**Ingestion:** Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death.

**Inhalation:** The vapor or fumes from this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing. Breathing this material at concentrations above the recommended exposure limits may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

### **DELAYED OR OTHER HEALTH EFFECTS:**

**Reproduction and Birth Defects:** This material is not expected to cause birth defects or other harm to the developing fetus based on animal data.

**Cancer:** Prolonged or repeated exposure to this material may cause cancer. Gasoline has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains benzene, which has been classified as a carcinogen by the National Toxicology Program (NTP) and a Group 1 carcinogen (carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains ethylbenzene which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Whole gasoline exhaust has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Risk depends on duration and level of exposure. See Section 11 for additional information.

## SECTION 4 FIRST AID MEASURES

**Eye:** Flush eyes with water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

**Skin:** Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

**Ingestion:** If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

**Inhalation:** Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

**Note to Physicians:** Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

## SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

### FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Flammable liquid.

**NFPA RATINGS:** Health: 1 Flammability: 3 Reactivity: 0

### FLAMMABLE PROPERTIES:

**Flashpoint:** (Tagliabue Closed Cup) < -45 °C (< -49 °F)

**Autoignition:** > 280 °C (> 536 °F)

**Flammability (Explosive) Limits (% by volume in air):** Lower: 1.4 Upper: 7.6

**EXTINGUISHING MEDIA:** Dry Chemical, CO<sub>2</sub>, AFFF Foam or alcohol resistant foam if >15% volume polar solvents (oxygenates).

### PROTECTION OF FIRE FIGHTERS:

**Fire Fighting Instructions:** Use water spray to cool fire-exposed containers and to protect personnel. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

**Combustion Products:** Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

**Protective Measures:** Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.

**Spill Management:** Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a

manner consistent with applicable regulations.

**Reporting:** Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required. This material is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Petroleum Exclusion. Therefore, releases to the environment may not be reportable under CERCLA.

## SECTION 7 HANDLING AND STORAGE

**Precautionary Measures:** READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many uth.

Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any other such use. Do not store in open or unlabeled containers. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling. Keep out of the reach of children.

**Unusual Handling Hazards:** WARNING! Do not use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.

**General Handling Information:** Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

**Static Hazard:** Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'. Improper filling of portable gasoline containers creates danger of fire. Only dispense gasoline into approved and properly labeled gasoline containers. Always place portable containers on the ground. Be sure pump nozzle is in contact with the container while filling. Do not use a nozzle's lock-open device. Do not fill portable containers that are inside a vehicle or truck/trailer bed.

**General Storage Information:** DO NOT USE OR STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

**Container Warnings:** Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

## SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

### GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.



## ENGINEERING CONTROLS:

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

## PERSONAL PROTECTIVE EQUIPMENT

**Eye/Face Protection:** No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

**Skin Protection:** No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Chlorinated Polyethylene (or Chlorosulfonated Polyethylene), Nitrile Rubber, Polyurethane, Viton.

**Respiratory Protection:** Determine if airborne concentrations are below the recommended exposure limits. If not, wear an approved respirator that provides adequate protection from measured concentrations of this material, such as: Air-Purifying Respirator for Organic Vapors.

When used as a fuel, this material can produce carbon monoxide in the exhaust. Determine if airborne concentrations are below the occupational exposure limit for carbon monoxide. If not, wear an approved positive-pressure air-supplying respirator.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

## Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling	Notation
Benzene	ACGIH_TLV	.5 ppm	2.5 ppm		Skin A1
Benzene	OSHA_PEL	1 ppm	5 ppm		
Benzene	OSHA_Z2	10 ppm		25 ppm	
Ethanol	ACGIH_TLV	1000 ppm			A4
Ethanol	OSHA_PEL	1000 ppm			
Ethyl benzene	ACGIH_TLV	100 ppm	125 ppm		A3
Ethyl benzene	OSHA_PEL	100 ppm	125 ppm		
Ethyl tert-butyl ether (ETBE)	ACGIH_TLV	5 ppm			
Gasoline	ACGIH_TLV	300 ppm	500 ppm		A3
Gasoline	OSHA_PEL	300 ppm	500 ppm		
Methyl tert-butyl ether (MTBE)	ACGIH_TLV	50 ppm			A3
Naphthalene	ACGIH_TLV	10 ppm	15 ppm		Skin A4
Naphthalene	OSHA_PEL	10 ppm	15 ppm		
Tertiary amyl methyl ether (TAME)	CHEVRON		50 ppm		

Refer to the OSHA Benzene Standard (29 CFR 1910.1028) and Table Z-2 for detailed training, exposure monitoring, respiratory protection and medical surveillance requirements before using this product.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

**Attention:** the data below are typical values and do not constitute a specification.

**Color:** Colorless to yellow

**Physical State:** Liquid

**Odor:** Petroleum odor

**pH:** NA

**Vapor Pressure:** 5 psi - 15 psi (Typical) @ 37.8°C (100°F)

**Vapor Density (Air = 1):** 3 - 4 (Typical)

**Boiling Point:** 37.8°C (100°F) - 204.4°C (400°F) (Typical)

**Solubility:** Insoluble in water; miscible with most organic solvents.

**Freezing Point:** NA

**Melting Point:** NA

**Specific Gravity:** 0.7 g/ml - 0.8 g/ml @ 15.6°C (60.1°F)

**Viscosity:** <1 SUS @ 37.8°C (100°F)

## SECTION 10 STABILITY AND REACTIVITY

**Chemical Stability:** This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

**Incompatibility With Other Materials:** May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

**Hazardous Decomposition Products:** None known (None expected)

**Hazardous Polymerization:** Hazardous polymerization will not occur.

## SECTION 11 TOXICOLOGICAL INFORMATION

### IMMEDIATE HEALTH EFFECTS

**Eye Irritation:** The Draize eye irritation mean score in rabbits for a 24-hour exposure was: 0/110.

**Skin Irritation:** For a 4-hour exposure, the Primary Irritation Index (PII) in rabbits is: 4.8/8.0.

**Skin Sensitization:** This material did not cause sensitization reactions in a Modified Buehler guinea pig test.

**Acute Dermal Toxicity:** 24 hour(s) LD50: >3.75g/kg (rabbit).

**Acute Oral Toxicity:** LD50: >5 ml/kg (rat)

**Acute Inhalation Toxicity:** 4 hour(s) LD50: >2000ppm (rat).

### ADDITIONAL TOXICOLOGY INFORMATION:

Gasoline is highly volatile and can produce significant concentrations of vapor at ambient temperatures. Gasoline vapor is heavier than air and at high concentrations may accumulate in confined spaces to present both safety and health hazards. When vapor exposures are low, or short duration and infrequent, such as during refueling and tanker loading/unloading, neither total hydrocarbon nor components such as benzene are likely to result in any adverse health effects. In situations such as accidents or spills where exposure to gasoline vapor is potentially high, attention should be paid to potential toxic effects of specific components. Information about specific components in gasoline can be found in Sections 2, 8 and 15 of this MSDS. More detailed information on the health hazard of specific gasoline components can be obtained calling the Chevron Emergency Information Center (see Section 1 for phone numbers).

**NEUROTOXICITY:** Pathological misuse of solvents and gasoline, involving repeated and prolonged exposure to high concentrations of vapor is a significant exposure on which there are many reports in the medical literature. As

with other solvents, persistent abuse involving repeated and prolonged exposures to high concentrations of vapor has been reported to result in central nervous system damage and eventually, death. In a study in which ten human volunteers were exposed for 30 minutes to approximately 200, 500 or 1000 ppm concentrations of gasoline vapor, irritation of the eyes was the only significant effect observed, based on both subjective and objective assessments. In an inhalation study, groups of 6 Fischer rats (3 male, 3 female) were exposed to 2056 ppm of wholly vaporized unleaded gasoline for 6 hours per day, 5 days per week for up to 18 months. Histopathology of the peripheral nervous system and spinal cord revealed no distal axonal neuropathy of the type associated with exposure to n-hexane even though gasoline contained 1.9% n-hexane. The authors concluded that gasoline treatment may have amplified the incidence and prominence of some naturally occurring age-related (subclinical) in the nervous system. **BIRTH DEFECTS AND REPRODUCTIVE TOXICITY:** An inhalation study with rats exposed to 0, 400 and 1600 ppm of wholly vaporized unleaded gasoline, 6 hours per day on day 6 through 16 of gestation, showed no teratogenic effects nor indication of toxicity to either the mother or the fetus. Another inhalation study in rats exposed to 3000, 6000, or 9000 ppm of gasoline vapor, 6 hours per day on day 6 through 20 of gestation, also showed no teratogenic effects nor indications of toxicity to either the mother or the fetus.

**CHRONIC TOXICITY/CANCER:** Wholly vaporized unleaded gasoline was used in a 3 month inhalation study. Groups of 40 rats (20 males, 20 female) and 8 squirrel monkeys (4 male, 4 female) were exposed 6 hours per day and 5 days per week for 13 weeks to 384 or 1552 ppm gasoline. One group of each species served as unexposed controls. The initial conclusion of this study was that inhalation of gasoline at airborne concentrations of up to 1522 ppm caused no toxicity in rats or monkeys. However, further histopathological examination of male rat kidneys on the highest dose group revealed an increased incidence and severity of regenerative epithelium and dilated tubules containing proteinaceous deposits. Lifetime inhalation of wholly vaporized unleaded gasoline at 2056 ppm has caused increased liver tumors in female mice. The mechanism of this response is still being investigated but it is thought to be an epigenetic process unique to the female mouse.

This exposure also caused kidney damage and eventually kidney cancer in male rats. No other animal model studied has shown these adverse kidney effects and there is no physiological reason to believe that they would occur in man. EPA has concluded that mechanism by which wholly vaporized unleaded gasoline causes kidney damage is unique to the male rat. The effects in that species (kidney damage and cancer) should not be used in human risk assessment. In their 1988 review of carcinogenic risk from gasoline, The International Agency for Research on Cancer (IARC) noted that, because published epidemiology studies did not include any exposure data, only occupations where gasoline exposure may have occurred were reviewed. These included gasoline service station attendants and automobile mechanics. IARC also noted that there was no opportunity to separate effects of combustion products from those of gasoline itself. Although IARC allocated gasoline a final overall classification of Group 2B, i.e. possibly carcinogenic to humans, this was based on limited evidence in experimental animals plus supporting evidence including the presence in gasoline of benzene and 1, 3-butadiene. The actual evidence for carcinogenicity in humans was considered inadequate.

**MUTAGENICITY:** Gasoline was not mutagenic, with or without activation, in the Ames assay (*Salmonella typhimurium*), *Saccharomyces cerevisiae*, or mouse lymphoma assays. In addition, point mutations were not induced in human lymphocytes. Gasoline was not mutagenic when tested in the mouse dominant lethal assay. Administration of gasoline to rats did not cause chromosomal aberrations in their bone marrow cells. **EPIDEMIOLOGY:** To explore the health effects of workers potentially exposed to gasoline vapors in the marketing and distribution sectors of the petroleum industry, the American Petroleum Institute sponsored a cohort mortality study (Publication 4555), a nested case-control study (Publication 4551), and an exposure assessment study (Publication 4552). Histories of exposure to gasoline were reconstructed for cohort of more than 18,000 employees from four companies for the time period between 1946 and 1985. The results of the cohort mortality study indicated that there was no increased mortality from either kidney cancer or leukemia among marketing and marine distribution employees who were exposed to gasoline in the petroleum industry, when compared to the general population. More importantly, based on internal comparisons, there was no association between mortality from kidney cancer or leukemia and various indices of gasoline exposure. In particular, neither duration of employment, duration of exposure, age at first exposure, year of first exposure, job category, cumulative exposure, frequency of peak exposure, nor average intensity of exposure had any effect on kidney cancer or leukemia mortality. The results of the nested case-control study confirmed the findings of the original cohort study. That is, exposure to gasoline at the levels experienced by this cohort of distribution workers is not a significant risk factor for leukemia (all cell types), acute myeloid leukemia, kidney cancer or multiple myeloma.

## SECTION 12 ECOLOGICAL INFORMATION

### ECOTOXICITY

The 96 hour(s) LC50 for rainbow trout (*Oncorhynchus mykiss*) is 2.7 mg/l.

The 48 hour(s) LC50 for water flea (*Daphnia magna*) is 3.0 mg/l.

The 96 hour(s) LC50 for sheepshead minnow (*Cyprinodon variegatus*) is 8.3 mg/l.

The 96 hour(s) LC50 for mysid shrimp (*Mysidopsis bahia*) is 1.8 mg/l.

This material is expected to be toxic to aquatic organisms. Gasoline studies have been conducted in the laboratory under a variety of test conditions with a range of fish and invertebrate species. An even more extensive database is available on the aquatic toxicity of individual aromatic constituents. The majority of published studies do not identify the type of gasoline evaluated, or even provide distinguishing characteristics such as aromatic content or presence of lead alkyls. As a result, comparison of results among studies using open and closed vessels, different ages and species of test animals and different gasoline types, is difficult.

The bulk of the available literature on gasoline relates to the environmental impact of monoaromatic (BTEX) and diaromatic (naphthalene, methylnaphthalenes) constituents. In general, non-oxygenated gasoline exhibits some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components which are the most prominent in the water soluble fraction and cause aquatic toxicity, are also highly volatile and can be readily biodegraded by microorganisms.

### ENVIRONMENTAL FATE

This material is expected to be readily biodegradable. Following spillage, the more volatile components of gasoline will be rapidly lost, with concurrent dissolution of these and other constituents into the water. Factors such as local environmental conditions (temperature, wind, mixing or wave action, soil type, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, can contribute to the weathering of spilled gasoline.

The aqueous solubility of non-oxygenated unleaded gasoline, based on analysis of benzene, toluene, ethylbenzene+xylenes and naphthalene, is reported to be 112 mg/l. Solubility data on individual gasoline constituents also available.

## SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

## SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

### Material Safety

Data Sheet  
LOXALCOX... RES, RES

29 9<sup>th</sup> Street, PO Box 217  
Clonard, MD 21220  
410-528-1000  
www.loxalco.com

### PRODUCT IDENTIFICATION

Product Name: [REDACTED]      Chemical Name: [REDACTED]  
CAS No.: [REDACTED]      Formula: [REDACTED]  
Synonyms: Polymeth ADE      Date Prepared: 01/20/08

### INGREDIENTS HAZARD CLASSIFICATION

Ingredient	Signal	Hazard	PPE
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED] Not listed as a carcinogen (NTP, IARC, OSHA)

### SHIPPING INFORMATION

Not regulated when shipped by land, water or air when packaged in single containers of 5000 pounds or less.

### PHYSICAL DATA

Appearance: [REDACTED]      Volatile by Volume: None  
Solubility in Water: Insoluble, trace  
Boiling Point: [REDACTED]      Melting Point: [REDACTED]

### FIRE AND EXPLOSION HAZARD DATA

Special Fire Fighting Procedures: A self-contained breathing apparatus should be worn in proximity to and during clean-up.  
Extinguishers: [REDACTED]  
Hazardous Combustion Products: [REDACTED]



## REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Contamination with water

Polymerization: May occur from contact with water, alcohols, glycols or other materials containing active hydrogens.

Incompatible: Water, alcohols, amines, strong bases.

Reactivity: [REDACTED]

## HEALTH HAZARD DATA

Permissible Exposure Limit: 0.02 ppm ceiling for MDI.

Effects of Overexposure: May cause rash or eye irritation upon contact. Inhalation of MDI vapors may cause bronchitis, chest discomfort, coughing and reduced pulmonary functions. Exposure may produce asthma-like symptoms. May also lead to allergic sensitization.

### First Aid Measures

Eyes: Flush with flowing water for at least 15 minutes. Then obtain medical attention.

Skin: Remove clothing and decontaminate and wash off with soap & water.

Inhalation: Remove to fresh air, which is oxygen rich if necessary.

Ingestion: Do not induce vomiting unless directed by a physician.

## SPECIAL PROTECTION INFORMATION

Ventilation: MDI has a very low vapor pressure at room temperature. Generalized ventilation typically cannot expose levels very adequately. Uses requiring heating and/or spraying may require more aggressive engineering controls or personal protective equipment. Monitoring is required to determine engineering controls.

Respiratory Protection: The specific respirator selection must be based on contamination levels of this material found in the workplace and the working time of the respirator. A supplied air, full-face mask, positive pressure or continuous flow respirator or a supplied air hood is required when airborne concentrations are a significant percentage of the TLV. A good fit must be maintained throughout the operation and be tested for air leakage or other unusual situations. If the respirator is used in a confined space, the atmosphere must be continuously monitored for oxygen deficiency, and the respirator must be tested for leaks. All operations must be conducted under approved work conditions.

Eye Protection: Wear goggles or chemical safety glasses.

Gloves: Chemically resistant rubber or plastic.

Work Practices: [REDACTED]

## SPILL, LEAK, OR RELEASE

Control: spill: Absorb with sawdust, etc., and shovel into open top drum. Decontaminate absorbent and spill area with 2% aqueous water solution. Let waste stand for 1 to 2 days, then dispose of waste in a licensed facility. Respiratory protection/ventilation is recommended during clean-up.

## SPECIAL PRECAUTIONS

Storage: [REDACTED]

Spill, Leak or Container: [REDACTED]

Other: [REDACTED]

Material Safety  
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Date Prepared: 2/22/99  
Last Revision Date: 6/16/00

SARA 313 INFORMATION

Requirements of Section 313 of the Superfund Amendments and Reauthorization Act (SARA) of 1986, as amended, and Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1992, and the corresponding Chemicals Reporting, Comparison and Entry Act (CERCLA) of 1980, are hereby notified.

<u>CHEMICAL NAME</u>	<u>CAS NUMBER</u>	<u>CERCLA ID</u>	<u>CONCENTRATION</u>
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Polymeric Diphenylmethane diisocyanate	9046-87-9		See MSDS - A Component

IMPORTANT NOTICE

This notification is a part of the Material Safety Data Sheet document and must not be detached. Any copying and redistribution of the Material Safety Data Sheet shall include copying of this notice and attaching the copy to the redistributed Material Safety Data Sheet.

**Material Safety  
Data Sheet  
FOAM CONCEPTS, LLC**

299<sup>th</sup> Street, PO Box 217  
Cloquet, MN 55720  
1-888-744-7584  
www.foamconceptsllc.com

**PRODUCT IDENTIFICATION**

**Chemical Name/Mixture**  
**Synonyms: Polyurethane Resin**

**Formula: N/A**  
**Date Prepared: 07/29/08**

**INGREDIENTS-HAZARD CLASSIFICATION**

Name	CAS NO.	%	REL.
Tertiary Amine Catalyst		<1	None Established
Not listed as a carcinogen (NIA, IARC, OSHA)			

**SHIPPING INFORMATION**

Not regulated under shipping laws, water or air.

**PHYSICAL DATA**

**Boiling Point (°F):** >200°F  
**Solubility in Water:** High  
**Appearance and Odor:** Amber liquid, faint ammonia odor  
**Specific Gravity:** 1.06  
**% Volatile by Volume:** 0

**FIRE AND EXPLOSION HAZARD DATA**

**Flash Point (test method):** >200°F (P-19) **Flammable Limits (vapor):** N/A

**Extinguishing Media:** Water, dry chemicals, CO<sub>2</sub>

**Special Fire Fighting Procedures:** A self-contained breathing apparatus should be worn to protect against toxic and irritating vapors.

**Major Fire and Explosion Hazards:** None

**ENVIRONMENTAL DATA**

**Biodegradability:**

**Chemical Stability:**

**Biodegradability:**

**Chemical Stability:**

**Biodegradability:**

**Hazardous Decomposition Products:** When burned: CO, CO<sub>2</sub>, NO<sub>x</sub>, and aliphatic fragments; halogen, halogen acids, and possibly carbonyl halides.



## HEALTH HAZARD DATA

Permissible Exposure Limit: None established.

Effects of Overexposure: May cause skin or eye irritation upon contact. Avoid breathing vapors. The dense vapors can cause irritation of the respiratory tract and may be harmful if inhaled.

### First Aid Procedures

**Inhalation:** Move to fresh air. If symptoms develop, if breathing is difficult, give oxygen and call physician.

**Ingestion:** Induce vomiting; get medical attention.

## SPECIAL PROTECTION INFORMATION

**Ventilation:** Local exhaust ventilation is recommended when working with this product. Uses requiring heating and/or spraying may require more ventilation or personal protective equipment.

**Respiratory Protection:** The specific respirator selected must be based on contamination levels of this material found in the workplace and the working limits of the respirator. A supplied air, full-face mask, positive pressure or continuous flow respirator or a supplied air hood is required when airborne concentrations are unknown or exceed threshold limit values. A positive pressure self-contained breathing apparatus may be used in emergency or other unusual situations. Full-face air purifying respirators are not recommended for use in these situations. All equipment must be NIOSH-certified against this material.

**Eye Protection:** Goggles or chemical safety glasses.

**Gloves:** Chemically resistant rubber or plastic.

**Other:** Avoid eye and skin contact. Eye wash system and showers should be available.

## SPILL OR LEAK PROCEDURES

Remove or extinguish ignition or combustion sources.

Contain spill. Absorb with sawdust, etc., and shovel into container. Waste material should be disposed of under conditions which meet federal, state, and local environmental regulations.

Wash area with detergent and water.

## SPECIAL PRECAUTIONS

Store between 60°F and 85°F out of sunlight. Keep tightly sealed. Relieve pressure slowly when opening container. R-Component drums can be sent to drum reconditioners or disposed of as ordinary industrial waste in compliance with pertinent regulations.

**CAUTION:** Under no circumstances should empty drums be burned or cut open with an electric or gas torch.

This information is for informational purposes only. It does not constitute a contract or warranty. The user should refer to the product label for complete information. The user should also refer to the Material Safety Data Sheet for this product.

**Appendix A**  
**General Code of Safe Practices**



**This Document and associated forms is not included here due to its size. Copies of the “General Code of Safe Practices” are available from the Site Health and Safety Officer or the Site Supervisor.**

**Appendix B**  
**Employee Training Attendance Form**

**This accompanying form and signatures confirm the employees and contractors named have participated in a detailed review of the Health and Safety Plan (HASP) and will be provided a copy of the plan if requested.**

Site Mine Reconnaissance/Closure Training Attendance Form

Project Area: _____, _____		HASP Review Location: _____
Instructor Name(s)		Date:
Print Name	Employee Number	Employee Signature
Instructor Signature:		Date:

**Appendix C**  
**Contractor Health and Safety Manual**



**This Document and associated forms are not included here due to its size. Copies of the “Contractor Health and Safety Manual” are available from the Site Health and Safety Officer or the Site Supervisor.**

# **Appendix D**

## **Job Hazard Analyses**

**The Documents and associated forms are not included here due to their size. Copies of the “Job Hazard Analyses” are available from the Site Health and Safety Officer or the Site Supervisor.**

# **Appendix E**

## **SOP**



**FMRS**  
Safe Operating Procedures

<i>Division</i>
<i>Reclamation Service-HMOSP</i>

<i>Operating Area</i>
<i>All Sites</i>

<i>Functional Area</i>
<i>Training</i>

<i>SOP Name</i>
<b>UTV OPERATION</b>

<i>Revision and Date</i>
<i>New - 03/08/2010</i>

<i>Issue Date</i>

<i>Approved</i>

**Purpose**

A UTV (Utility Terrain Vehicle) is essentially an ATV (All Terrain Vehicle) that has been equipped with a flat bed or utility box. An ATV Operator sits on a seat that straddles the vehicle, there is no seat belt and it is not designed to carry a passenger. The UTV Operator sits on a bench type seat and is secured by a seat belt. A UTV can carry passengers and transport material. Due to the unique handling characteristics of this type of vehicle, each operator should receive training prior to operation. UTV Operators do not have to complete an ASI approved training course

**Safety**

- o **Behaviors:** Consequence thinking, attention to surroundings, thinking about the next 15 seconds and focusing on the task at hand. Driving while fatigued or sleepy can cause loss of focus. Smoking could be distracting and/or a fire hazard (Smoking is not authorized in the equipment). When leaving equipment, ensure that equipment is cleaned and all trash is removed and disposed of in the proper container.
- o **Body Position/Posture:** Maintain proper body ergonomics and maintain alertness when operating equipment. Use "Three points of contact" and proper body ergonomics when ascending and descending stairs or ladders. When placing wheel chocks, utilize "Move Smart" techniques.
- o **Communication:** Two-way Radio is licensed for English only. All communication should be clear, concise, courteous and non-threatening. Two-way radio or visual contact is vital.
- o **Electrical:** When operating equipment, always lookout for overhead electrical wires. Operators are not allowed to handle loose or bare wires, rewire or tamper with equipment wires.
- o **Emergencies: Know all emergency procedures. Refer to SOP's.**
- o **Items downing a UTV:** Defective horn, brakes, steering, seatbelt, speedometer, tachometer, hazard/signal lights, shattered or missing mirror and B/O or missing fire extinguisher will down the UTV. All other defective items on any equipment, machinery and tools shall be corrected in a timely manner to prevent the creation of a hazard to persons per MSHA standard 30CFR.56.14100. Additionally A defective headlight during daylight hours must be reported and repaired before night fall. At night time, both headlights (one on each side) must be in working order. A brake light B/O must be repaired on a timely basis, but two B/O brake lights will down equipment immediately.
- o **Obstructions:**
  - \* Foot Traffic
  - \* Inadequate Visibility
  - \* Spillage
  - \* Channels
  - \* Weather Conditions
  - \* Traffic
  - \* Structures
  - \* Berms
- o **Operating Procedures:** Reading while operating equipment is prohibited. Operators must obey all traffic and posted signage. Always be aware of support equipment working or traveling in the area.
- o **Repetitive Motion:** Correct ergonomics, maintaining neutral wrist position when operating hand controls



and periodically flexing feet and lower leg muscles for circulation. Correct posture and pace when ascending and descending ladders. Utilize "Move Smart" techniques. Practice re-energizing techniques for static body posture.

- o **Stored Energy:** Avoid sharp objects that will cause sudden pressure loss in tires that might cause high speed projectiles. The following could cause bodily injury when ruptured: High pressure hoses, tires, hand held fire extinguishers and/or engine components under pressure (coolant hoses, brake lines, Air brakes).
- o **Tools/Equipment in Good Condition:** Ensure flashlight is in working order. Portable fire extinguisher must be properly inspected and inspection tags punched or signed on the first of every month. When the red indicator pin is not depressed, the portable fire extinguisher is B/O, or if the gauge does not reflect the proper charge (whether over or under charged) the portable fire extinguisher is B/O.
- o **Weather Conditions:** Use extreme caution, drive to road and terrain conditions. Be aware of your surroundings. During adverse weather conditions the minimum following distance between all types of vehicles is 200' (Feet).
- o **PPE Requirements:**
  - Hard hats must be worn with brim towards the front. Caps, hats or sun visors are not to be worn under hard hats
  - Hearing protection is effective in preventing hearing loss when around noisy equipment and environmental background noise, i.e., tire failures, back up alarms, horns and engine noise.
  - Flashlights must be in good working order.
  - Properly fitted leather gloves must be worn when working in pinch point areas or to protect hands from the elements.
  - Respirators need to be used when working around high dust concentrations.
  - Safety glasses or prescription safety glasses with side shields which meet ANZI Z-87.1 criteria must be worn. **Clear safety glasses must be worn at night, no dark glasses.**
  - Safety reflective vests must be worn as the outer garment when off equipment.
  - Seat belts must be worn properly (According to Manufactures Recommendations) at all times when operating equipment.
  - Steel toed work boots with well defined heel must be worn.

o **Fire/Smoke/Emergency Conditions and Procedures:**

Always remember if there is any smoke, fumes or vapors present in the cab of your machine, it is critical that you act immediately to avoid exposure to smoke, fumes or vapors. **There is no reason to operate in the presence of these conditions.** These procedures are also outlined in your Operators Manual and your "Specific Code of Safe Practice." Stop the machine as quickly as possible. Secure the machine by putting it in neutral and setting the park brakes. Shut down the machine to eliminate any fuel or energy source. If necessary and equipped, pull the pin and strike the knob of the fire suppression system. If necessary use the radio to call a Mayday and follow proper Mayday procedures. Exit the machine and get in a safe location out of the way and far enough from any danger. **DO NOT JUMP FROM THE MACHINE.**

o **UTV on roadway use**

The UTV's are registered and can be operated on public and private roadways in accordance with the state and local laws.

**Any violations of the above safety rules can lead to disciplinary actions and/or termination**

**Environmental**

Potential of Oil Spill - Proper clean up and disposal of contaminated material  
Potential of Fuel Spill - Proper clean up and disposal of contaminated material

**PPE**

Hardhat	Safety Toe Footwear	Appropriate Gloves
Safety Glasses with Side Shields	Reflective Vest	

**Definitions/References and Other Information**

UTV - Utility Terrain Vehicles	Reference MSHA 30 CFR 56/57/58 and Part 62 12th Edition
ASIA - All Terrain Vehicle Safety Institute	Reference Manufactures Operations Manual
ATV - All Terrain Vehicle	Reference Code of Safe Practice

## Training

Mentor/Trainer/Supervisor Comments:

Attach Trainee completed pre-operational inspection checklist.

Training Dates	Reason for Training	Evaluation
Begin:	<input type="checkbox"/> Initial	<input type="checkbox"/> Qualified and Authorized
End:	<input type="checkbox"/> Re-Qualification	<input type="checkbox"/> Disqualified (Reason)
Equipment Identification: Make: _____ Model: _____ Capacity _____		

### Final Training Sign Off

Employee		PS:	DATE:
Mentor/Trainer		PS:	DATE:

5000-23/Green Card Completed and Submitted for Record Keeping

### Task: UTV Operation

The Operator is responsible for ensuring that all clothing and personal protective equipment is in good serviceable condition and worn properly.

- Operators should review the manufacturer's Operator Manual for the particular UTV that they will be operating.
- Complete a pre-operational inspection of the vehicle.
- Board the UTV and fasten your seatbelt.

**\*Seat belt use is mandatory and will be worn in accordance with Manufacturer's directions.**

- Before starting the UTV, make sure the parking brake is on and the transmission is in **Neutral**.
- The typical UTV is equipped with a manual choke to assist in cold weather starting.



Typical UTV



Hydraulic Oil Tank and Dipstick

- If equipped with a choke and the outside air temperature is less than 68 degrees and the engine is cold:
  - Pull choke knob all the way out and hold it in that position
  - Turn the ignition key and start the engine
  - As the engine warms up, slowly push the choke knob in until it is back to its normal position and the engine is idling smoothly



Coolant Reservoir and Radiator

- If equipped with glow plug heater, wait until light on dash goes out and then turn the ignition key and start the engine.

- After the engine is started, depress the brake pedal, release the parking brake, put the transmission in the desired gear and direction position.

**\*Use standard horn signals**  
**One to Start**  
**Two to move Forward**  
**Three to move in reverse**



Brake reservoir and Battery

9. Avoid sharp turns and sudden acceleration or braking that could cause you to lose control and possibly turn over.

10. Avoid panic braking, always brake smoothly and anticipate stops by reducing the speed of the UTV.

11. To prevent damage to the transmission, come to a complete stop before shifting the transmission to change direction of the UTV.

12. Come to a complete stop before engaging the differential lock if equipped.

13. The typical differential lock requires the operator to pull a lever, knob or to step on a lever on the floor to lock the differential. (consult the Operators Manual).

**\*Remember the turning radius will be increased when the differential is locked.**

14. It is highly recommended that the UTV be operated with the differential lock in the **Unlocked** mode/position under normal operating conditions and especially on hard surfaces to prevent excessive tire wear and avoid possible damage to drive train components.

15. Some models may be capable of being operated in two wheel drive or four wheel drive.

**\*Come to a complete stop before shifting between two wheel and four wheel drive**

**\*Handling characteristics will be significantly different when operating in four wheel drive**

16. Obey all posted speed and traffic control signs.

17. Yield the right of way to larger vehicles.

18. Operate the UTV to weather and road conditions.

19. Adverse weather conditions affect the handling (steering and braking) of the UTV.

20. Modify driving under the following conditions:

Blowing Dust	Ice
Rain	Fog
Mud	Rough Terrain
Snow	

21. Maintain control of the UTV at all times by operating at appropriate speed.

22. The operator is responsible for ensuring that the passenger is wearing all required PPE, fastens their seatbelts and keeps all body parts within the vehicle at all times.

23. Ensure that any cargo being transported is properly secured and is not overhanging or being dragged behind the vehicle.

24. Dump bed lever lockout should be used (if equipped) to prevent the accidental dumping of the bed.

25. Do not exceed the rated capacity of the vehicle, check the vehicle data plate or operators manual for the capacity of the specific UTV being operated.

26. Do not operate the UTV beyond its capability or your own capabilities.

**\*Use extreme caution when operating on inclines and do not operate on grades steeper than 15%.**

**\*Always travel straight up and straight down an incline.**

**\*Do not attempt to traverse an incline at an angle due to the**



Fuel Tank



Manual Dump Lever



Transmission Selection Lever, 2 or 4 Wheel Drive Switch, Light Switches, Ignition, Horn



Throttle, Brake, Parking Brake



Transmission Linkage

**high potential for a roll-over.**

27. Travel on active haulage roads that exposes the UTV to haulage trucks and other mine traffic should be avoided. Whenever possible utilize alternate routes/roads to avoid haulage and mine traffic.

28. If the UTV must travel on haulage roads, establish communication with the users of the haul road and let them know your location, destination and/or direction of travel.

29. Always park a UTV in a secure location, come to a complete stop, shift the transmission to **Neutral**, engage the parking brake, turn off the engine, exit the vehicle and place a wheel chock under the tire to prevent it from rolling.

30. Allow engine to cool before servicing.

31. Report any safety defects or mechanical issues immediately. If a safety defect is found the UTV is B/O and will be repaired prior to use. If the Mechanical defect prevents safe operation, then the UTV is B/O and must be repaired prior to use.

32. When using winch, insure that you keep your hands and fingers away from pinch points. Wear leather gloves. Keep out of the line of fire if the cable should snap. Do not exceed the winch capacity.



Winch Control Switch



Winch

**SOP Name: Rope Safety and Rescue**

**SOP No.: HMOSP-012**

**Area: Historic Mine-Openings Safety Program (HMOSP)**

**Issue Date: 6/14/2012**

**Revision Date:**

**Issued By: Kevin Cardin, Superintendent, HMOSP, FMRS**

**Purpose/Scope:**

The purpose of this SOP is to

- (1) Provide information and guidance on acceptable practices and procedures
- (2) To protect HMOSP employees from the hazards associated with rope safety and rope access work methods while working at locations where a fall or slip may exist.

**Definitions:**

**Access Zone:** The area in which people are at risk of falling or slipping such as on-line or near a working edge or a steep angle slope. This area requires protective measures such as verbal warnings, signs, barriers, safety lines, or other devices designed to prevent or arrest a fall.

**Anchor, Anchorage:** A place, fixing or fixture that supports and to which the various ropes and rope systems are attached.

**Approved Equipment:** Equipment deemed appropriate for use with rope access techniques. Approved equipment shall meet all manufacturer specifications and may have an expiration date.

**Ascender:** A type of rope grab that is used primarily for climbing rope by gripping the rope when loaded in one direction and sliding freely in the opposite direction. Note that many ascender type rope grabs are not sufficient for fall arrest.

**Attendant:** An individual stationed at the site of the rope access work who monitors the rope access workers and who performs all Rope Access Attendant duties assigned in the employer's rope access work program.

**Belay:** An active system operated by another employee for the purpose of arresting the fall of a rope access worker.

**Carabiner:** A type of connector, formed as a complete loop with a spring-loaded entry gate.

**Carabiner, Locking\*:** A carabiner with a mechanism that reduces the possibility of a gate being opened inadvertently.

\*A locking mechanism requires at least two different consecutive manual actions to open the gate.

**Descender:** A device that acts as a friction brake on a rope. It is normally attached to the operator and enables the operator to control the rate of descent.

**Dynamic Rope:** A rope that is specifically designed to absorb the energy of a fall by extending in length and thereby minimizing the shock load.

**Fall Arrest:** Equipment, system, or structure that catches a falling employee.



**Fall Prevention:** Equipment, system, or structure that prevents a fall from occurring.

**Focused Anchor Point:** A system of using two or more smaller objects to create a solid anchor system.

**Harness:** A set of straps and belts that are fitted to somebody to fasten a person to something or to keep the person in position. Harnesses with inspection tags will be inspected monthly. All harnesses regardless of inspection tags will be inspected prior and after each use to maintain quality equipment. Harness performance and construction shall comply with relevant, nationally recognized standards such as NFPA, UIAA, ANSI, ASTM.

**Mechanical Advantage:** The use of one or several pulleys used in conjunction with each other to increase the pulling power.

**On Line:** The condition of being suspended from or attached to a rope.

**Picket System:** An anchor system using three (3) 36-inch tent pegs and a metal fabricated base to allow for safe tie off procedures in areas where natural anchors do not exist.

**Prussic cords:** Formed using 6 to 9mm kern mantle rope, using a double fisherman knot connecting both ends of the rope together, used in place of an ascender.

**Pulleys:** Constructed of aluminum, used for mechanical advantage systems or change of directions, may be single or multi sheave.

**Rope Access:** Techniques used to gain access to buildings, other structures, geological features, or manmade features by means of ropes. It applies to all cases where ropes are used as: As the primary means of support; as means of primary protection or positioning; and where people descend or ascend on a rope or traverse along horizontal rope.

**Rope Grab:** A device used to grasp a life safety rope for the purpose of supporting a load.

**Safety Check:** A check of the system(s) that have been put in place prior to the system being used. Safety checks are conducted to ensure that all safety protocols have been met and that the tools or equipment is safe for use.

**Webbing:** Webbing used shall have a minimum breaking strength of at least 17.5 kN (4,000 lbs.) when new. High modulus fibers such as Spectra, Kevlar, Vectran and similar fibers with minimum elongation may break when subjected to shock loading and shall not be used where a shock load may be applied.

### Procedures:

A Job Hazard Analysis will be performed prior to work beginning in an area that will require the use of safety lines and ropes.

**No** Employee shall use this equipment without prior formal documented training.

Supervisors/Employees shall recognize and mitigate any/all hazards that may exist. The HMOSP team will reduce or eliminate the hazards to As Low as Reasonably Achievable (ALARA) standard.

It is **Everyone's** responsibility to communicate any warnings or unsafe practices.

All HMOSP employees shall wear proper PPE while working with and around ropes. Proper PPE includes steel toed shoes, gloves, eye protection, and hard hats. The use of helmets with chin straps is mandatory while on line.

All equipment will be used properly and to the manufacture's specifications. All equipment must be compatible with each other.

Employees shall inspect all rope gear that will be used prior to the service application.

Employees shall inspect all rope gear that has been used. Employee's will look for defects in the equipment and notify the immediate supervisor in the event that equipment is deemed unsafe or damaged.

Employees/Supervisors are responsible for removing damaged items from the work area so they will not be used by accident.

Employees shall remove all items from their shirt and pant pockets prior to donning a harness.

Employees/Supervisors will ask other team members for a safety check of all safety devices prior to any work being done. This includes harnesses, anchors, mechanical advantages, knots, and setup.

Employees/Supervisors shall inspect all anchor points to ensure they are safe. Team members will construct safe anchor systems by utilizing their training: i.e. Picket System, Focused Anchor Point. Etc.

Always use a secondary anchor system for the belay or backup.

Employees/Supervisors shall construct, inspect, and analyze safe rope systems.

Employees shall use proper knot tying procedures and utilize proper knots for the application.

Providing a safe work environment will require that everyone involved is cooperative and has a team based attitude. The use of the "Safety check" will be used to ensure safety procedures are followed and that the team can identify any deficiencies "PRIOR" to the system or equipment being used.

### **Disposal Of Equipment:**

All defective equipment will be disposed of onsite by the site supervisor. The description of the equipment and disposal method will be logged and photographed in the system and recorded for replacement.

No defective equipment will be removed from Freeport-McMoRan properties.

### **References:**

SPRAT Society of Professional Rope Access Technicians

D2000 Safety

FCX Fall Protection SOP, **FCX 010**

Code of Safe Practices, **Page 15**

MSHA Standard, **30 CFR 56.15005 Safety belts and lines:**



# FMRS Safe Operating Procedure

Department	Operating Area	Functional Area
Reclamation Services-HMOSP	All Sites	All Sites
SOP Name		Code Number
HMOSP Sealing Procedures with Polyurethane Foam		

Team Approval Date	Sponsor Approval Date	Manager Approval Date
Revised: 3/02/2011		

## Purpose

*Instructions for Sealing Historic Mine-Openings with Polyurethane Foam Products*

## Safety

**Behaviors:** Consequence thinking, be aware of surrounding, PPE, two way radios, and miscommunications or inattentiveness.

**Body Position:** Avoid line of fire by making sure all equipment is properly secured and employees are free and clear while the task is performed.

**Chemical; (includes dust, vapors, and fumes):** Always try to keep dust at a minimum. Use any dust control measures possible. Be aware of potential causes of MDI fumes while pouring foam products.

**Communication:** Make sure that radio or verbal contact is possible with supervisor or other operators in the area.

**Confined Space Permits:** May be required if dwellings, excavations, or mine hazard conditions exist. **Refer to the Confined Space Guidelines for permit requirements and evaluation forms.**

**Competent Person:** Is one who is capable or certified to identify existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to eliminate/reduce to an acceptable level or discontinue the job.

**Competent Personnel must be trained in confined space and emergency procedures.**

**Fluid Under Pressure:** Polyurethane Foam (PUF) in 1/3 cubic yard sets.

**Fall Protection:** All fall protection must be worn in accordance to the **Fall Protection Guidelines**. Fall protection equipment will be inspected prior to use.

**Impact:** Fall of materials from above.

**Noise:** Tools that may require the use of hearing protection, Drills, Jack Hammer, Saws, etc.

**Object Weight:** Weight of PUF and other materials (bat gates, rebar, geo fabric).

**Obstructions:** Clear all obstructions from the work area to eliminate tripping hazards.

**Stored Energy:** Contents under pressure, silicone spray. There may also be stored energy in the ropes and other tie off devices around the mine opening.

**Tools and Equipment Vibration:** Carpal tunnel, fatigue.

**Tool/Equipment in Good Condition:** Report any unsafe problems of equipment to the Supervisor or Senior crew member.

**Temperature Extreme:** Weather conditions (heat, cold).

**Emergency Procedures:** In the event of an incident, follow the reporting procedures by repeating MAY-DAY three times over the two way radio, if available. Utilize the Satellite Phone or Company Cell Phone if not in radio frequency range. Report your name, location, the nature of the incident and follow the instructions given to you. Try to maintain good composure. DO NOT give out the name of the victim(s) or any equipment number(s) involved in the incident. If the victim needs immediate help secure the area before entering, try to have someone monitor the radio or other communication devices to give and receive instructions.

**Slips, Trips, and Falls:** Keep eyes on path avoiding oily and slippery surfaces; avoid other tripping hazards that could cause slips, trips, and falls (Remove any slipping or tripping hazards). Always use three points of contact on stairs, ladders, or platforms. Watch for unlevel, wet, and rocky ground. Always maintain three points of contact while traversing rough and rocky terrain.

**Mounting and Dismounting:** Always use three points of contact facing the machine. Utilize the steps and ladders when mounting and dismounting a piece of equipment.

**Strains and Sprains:** Maintain proper body alignment by keeping back straight and knees bent. Avoid twisting, keep feet flat, and work within easy reach.

**Struck by or Against:** Avoid being within the line of fire. Be aware of your body's position while performing a pre-op inspection or work site inspection. Watch banks and high walls for loose material.

**Seat belts:** Wear seat belts at all times when operating a vehicle, UTV, or piece of equipment.

**Clearance:** Be aware of over head and side obstructions that could cause harm or damage to the operator and/or to the equipment. Maintain 10ft distance from all power lines.

**Inadequate Visibility:** Use extreme caution in inclement weather. Drive with clean windows and mirrors.

**Riders:** Riders are Not Allowed on any machine unless there is an additional seat and seat belt available for each rider.

**Material Safety Data Sheet:** MSDS sheets are available for Polyurethane Foam and other chemicals that are used. (See the team Environmental Specialist).

## Environmental

**Maintain a Clean Work Place:** Keep the work area clean, dispose of trash and waste (lunch leftovers and trash, cigarette butts, boxes from foam, etc.). Clean out the cab and beds and clean the windows and mirrors.

**Report Environmental Problems:** Report to your supervisor or coach any condition that may become an environmental hazard and follow the step by step procedure given to you by your supervisor to eliminate the hazard.

**Report Spills:** Report all environmental spills (i.e. PUF, fuel, hydraulic, engine oils, and coolant) to the supervisor.

**Material Safety Data Sheet:** Reference all MSDS sheets on spills MSDS #'s.

## References Other Information

**Tools and Materials Required:** Hand Tools, Operational Equipment, PUF, Satellite Phone, Hand Held Radio, Rope Safety and Rescue Equipment, and Travel Restraints.

**PPE Required:** Approved hard hat, approved safety glasses with side shields, and approved steel toe boots (Safety equipment must meet MSHA requirements). Gloves are required while performing any task that puts hands at risk. Long Sleeve shirts are required while working around PUF. Respirator is required when working in or around dusty conditions. Ear protection is required when working in or around noisy conditions. Flashlights are required during night shifts or in dark working areas.

Reflective vests or High Visibility Shirts must be worn when outside a vehicle in production areas or near roadways where vehicles or equipment may be in motion.

**Position/Title; "Who Does the Job":** Task trained / qualified personnel

**General Code of Safe Practice:**

**Guiding Principles:**

**Abandoned Mine Information:** *The BLM is committed to minimizing physical and environmental hazards associated with abandoned mines in Arizona.*

*In the mid-1990's, the BLM began inventorying abandoned mines on BLM-managed lands. Arizona's inventory was conducted by the Arizona State Mine Inspector's Office (ASMI) with funds and equipment provided by the BLM from its mining law and hazardous materials management programs. The inventory focused around population centers and areas where there is a high potential for recreational use. Projections from the ASMI inventory suggest that there may be as many as 27,000 abandoned mine features in Arizona.*

*Many of these mine features are relatively insignificant, such as shallow trenches and small exploration pits. However, others pose physical and environmental hazards that will require some form of remediation or closure.*

**History of the Arizona State Mine Inspector's Office, Abandoned Mine Program:**  
([http://www.asmi.state.az.us/abandoned\\_mines/history.asp](http://www.asmi.state.az.us/abandoned_mines/history.asp))

*In 1992, the Arizona State Mine Inspector entered into an agreement with the Bureau of Land Management to survey federally-managed lands and inventory abandoned and inactive mines. To fulfill the terms of this agreement, the Mine Inspector established a student intern program.*

*In 1996, the Mine Inspector finalized an agreement with the National Park Service ([www.nps.gov](http://www.nps.gov)) to assist in closures of abandoned mines in national parks, monuments, and recreational areas throughout the state. As part of this agreement, ASMI will contract local companies to conduct the required mine closures at selected parks.*

*In 1999, the focus of the cooperation with the Bureau of Land Management changed from inventory to mine remediation. For more information, visit the BLM web site at [www.blm.gov/narsc/aml](http://www.blm.gov/narsc/aml).*

*In the Second Regular Session the Abandoned Mines Safety Fund was introduced as Senate Bill 1250. The objectives of the Safety Fund are to encourage private contributions that can be used directly to abate public safety risks on State Lands and leverage legislative appropriations to increase funding for this work. Money placed in the fund is limited to covering the direct cost of work and cannot be used to cover administrative costs. The bill passed through the Senate and the House, and in a formal ceremony in September 1998, the Governor signed the bill into law, formally initiating the Abandoned Mine Safety Fund.*

## Step by Step Procedure

**Work Area Inspection:** *Perform a work area inspection by physically walking the area and identifying any and all hazards that may exist in the area.*

**Control/Reduce or Eliminate Hazards:** *Utilize training and engineering controls to eliminate or reduce the hazards around the work area to an ALARA (As Low As Reasonably Acceptable) standard. Utilize proper Fall Protection Procedures while working around any danger where a fall hazard may exist. Eliminate tripping hazards around the work area.*

**Material Control:** *Maintain control of the supplies and equipment being used in the area. Anchor points may need to be established to maintain the weight of the materials being installed until the mine opening has been sealed. Use of rebar stakes, natural terrain features and/or equipment may be necessary. Bat gates, vent pipes, and bulkheads will be secured either by ropes, fir strips, or any other mean possible at the mine opening.*

**Scaffolding Planks/Walkways:** *All walkways will be clear of debris and tripping hazards. All scaffolding/planks will be secured and anchored in a way to eliminate any twisting or falling motions. Personnel utilizing the scaffolding/planks will be tied off with fall protection devices in accordance with the **Fall Protection Guidelines**.*



**Mixing Area:** An area needs to be cleared of all debris and a mixing platform established. Utilize the bed of the UTV or other equipment/vehicle if possible. In areas not accessible by equipment, utilize cardboard and geo-fabric to make a mixing platform. If utilizing barrel sets of PUF, pour two equal parts of the PUF agents into **two** buckets (five (5) gallon capacity). The buckets will be marked to have a designated capacity line. Then take the **two** buckets containing the two agents and pour the contents into **one** bucket (five (5) gallon capacity). Begin mixing with a 1" x 2" stick. The bucket will then be carried to the pour site and poured into the mine opening. If utilizing the box sets of foam, remove one of the 1/3 cubic yard bags and lay on the mixing area. Remove the divider from the center of the bag. Start mixing the two agents together by placing your gloved hands onto the plastic bag and use gentle mixing motions. Once the agents are mixed thoroughly, squeegee from the top of the bag to the center and cut a corner of the bag off to pour from. The bag will then be carried to the pour site and poured into the mine opening.

**Pouring Foam:** Pour the foam into the mine opening starting at the edges if possible. Ensure that foam is cooled to the proper temperature before continuing. This eliminates Egg Shell and heavy cracking. Continue to pour in stages until the mine opening is full of foam and completely sealed.

On ADIT features, a rock wall will be built while pouring the foam in stages. This allows the foam to be used as a grout, cementing and anchoring the rocks into the foam.

On SHAFT features, the foam will be poured until reaching a depth below the existing ground surface of approximately two (2) feet. Cover material will later be placed on top of the foam to blend into the existing ground surface.

**Covering Foam:** Cover the foamed mine opening with rock and soil material. Foam breaks down from exposure to the ultraviolet rays from sun light. The opening must have a natural cover so that it may blend in with the surroundings and environment. Consider all weather and water run-off conditions when establishing the site.

**Documentation:** Paper or Electronic documentation of the site will be conducted using Site Evaluation Forms. All the forms will be filled out correctly. A metal tag must also be filled out for the site and placed in a visible manner. The information will include the site ID Name and Evaluator. Signage must be properly placed in accordance with Arizona Regulations, or other State or Federal agency, as appropriate. The endangered species documentation will also be filled out upon completion of the closure and filed along with the original site evaluation forms.

**Photo Documentation:** Photos will be taken of the mine opening to document existing site conditions and the work being done. Photos will include open pictures, progress views, and closure pictures. The Open and Closure photos will include latitude and longitude information. All Open, Closed, and Progress photos will include proper identification and appropriate camera attributes to document mine opening status at the time of the photo.

**Clean-Up:** Clean up the site when work is finished. Remove all trash and materials that the HMOSP team brought into the area. If trails and walkways were established, re-groom the area to a natural state before leaving the area.



**SOP Name:** Historic Mine-Openings Safety Program White Shirt Only Policy

**SOP No.:** 04-09

**Area:** Resource Management Historic Mine-Openings Safety Program (HMOSP)

**Issue Date:** 12/3/2012

**Revision Date:**

**Issued By:** Resource Management

**Purpose/Scope:**

For HMOSP members to have the option of wearing the white long sleeve shirts while conducting closure work in remote locations.

During an Africanized Bee training session the instructor, Reed Booth, stated that any dark or bright colors should be avoided when working in areas that persons may encounter Africanized Bees. The instructor suggested that with the HMOSP crew working in remote locations that it may be in the best interest to wear a white colored shirt in lieu of the fluorescent yellow or orange that the crew mainly wears. The Instructor stated that in past experiences that the Africanized Bees have responded aggressively to dark or bright colors more than white or light colors. The crew is usually working in remote locations that are not with in an active traffic pattern of mine haulage or light vehicle traffic.

**Definitions:**

Africanized bees – A hybrid variety of the Western Honey Bee, acquired the name killer bees because they will viciously attack people and animals that unwittingly stray into their territory, often resulting in serious injury or death.

**Procedures:**

1. If Africanized Bees are seen or are anticipated to be present in an area, crew members will have the option to wear white only long sleeve shirts without a reflective vest while conducting closure activities in remote locations and away from active mining operations. In the event that Africanized Bees attack, reflective vests should be removed.
2. Crew members will have fluorescent yellow or orange shirts and/or reflective vests available if they are to enter an active mine area where the possibility of contact with either light vehicle or haul truck traffic exists.
3. The crew member will wear fluorescent yellow or orange shirts and/or reflective vests when they are in all traffic areas of a mine and near roadways both public and private.
4. Crew supervision will communicate with the safety personnel at all active mine locations. The Supervisor will explain our SOP and concerns to seek approval from the safety departments.

**References:**

**MSHA Standard:** 30 CFR 56.15000 Subpart N, Personal Protection

**OSHA Standard:** 29 CFR 1926 Subpart C, General Safety and Health Provisions

**FCX:** Resource Management General Code of Safe Practices, Section IV

**HSMS:** 4.4.6(5)

**SOP Name:** Drum Transporter

**SOP No.:** 04-10

**Area:** Resource Management

**Issue Date:** 5/9/13

**Revision Date:**

**Issued By:** Resource Management

**Purpose/Scope:** To describe the safe operation and use of the Drum Transporter

**Definitions:**

**Drum Transporter** – Hydraulic, Rolling Drum Hoist

**Procedures:**

1. Familiarize yourself with the MSDS of the material you will be transporting. Conduct a workplace examination to ensure it is safe for Drum Transporter operation
2. Complete a Pre-Operation Inspection of the Drum Transporter in accordance with the operators manual. If defects are found that prevent the safe operation of the Drum Transporter, B/O the Drum Transporter and do not operate it. Report the defect(s) to supervision.
3. Insure that you do not exceed the manufacturers maximum load rating. Drum should only be lifted to the height required to safely move the drum or load the drum. Do not transport the drum when hoisted to high, you have a higher chance of tip over.
4. Insure that the drum is secured to the hoist prior to hoisting drum.
5. When the Drum Transporter is loaded, proceed slowly and with caution, insure that the ground is even and keep your eyes on your path.
6. When lowering the drum, keep your hands and feet clear.
7. When storing the Drum Transporter, insure that it is stored safely and that the legs are in the stored position and not a tripping hazard.

**References**

**MSHA:** 30 CFR 56, Subpart H-Loading, Hauling and Dumping; Subpart O-Materials Storage and Handling

**OSHA:** 29 CFR 1926 Subpart H - Materials Handling, Storage, Use, and Disposal

**FCX:** Resource Management General Code of Safe Practices

**HSMS:** 4.4.6(5) Operational Controls

Department of Health and Safety	SOP No.	FCX - 05
	Revision No.	2
	Supersede	NAOM 004-01
CONFINED SPACE ENTRY CONFINED SPACE ENTRY	Task Classification	<input checked="" type="checkbox"/> Highly Critical <input type="checkbox"/> Critical <input type="checkbox"/> Non-Critical
Approval Date: July 24, 2012	Original Date: July 21, 2009	Relevant SOPs –

## I. Purpose and Scope

To provide guidance for the health and safety of company and contract personnel entering and/or working in confined spaces on company property.

## II. Definitions

- Acceptable Entry Conditions:** The risk management plan for the confined space, including the conditions that must exist in a confined space to allow entry and to ensure that employees involved with a confined space entry can safely enter into and work within the space. This includes a risk management plan that incorporates all safety-related aspects of the entry (e.g. ventilation equipment, LOTOTO requirements, allowable concentrations of air contaminants, remote rescue plan, etc.).
- Note:** Care must be taken to identify and evaluate the potential for conditions to change within the space as a result of the work being done (e.g. application of coatings, welding, removal of sludge, etc.)
- Attendant:** An individual stationed outside a permit required confined space who monitors the authorized entrants and who performs all the attendant duties assigned in the confined space program. An attendant will watch only one space at a time. This responsibility can be rotated. The attendant shall never break the plane of the entrance into the confined space nor shall they leave their post (unless relieved by another attendant or the entrants exit the space).
- Authorized Entrant:** An employee who will be entering the confined space and is aware of the hazards, PPE requirements, acceptable entry conditions, and communication procedures prior to entry.
- Blanking or blinding:** The absolute closure of a pipe, line or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line or duct with no leakage beyond the plate.

<b>Confined Space:</b>	<p>A space that meets all three of the criteria below:</p> <ol style="list-style-type: none"><li>1. Is large enough and so configured that a person can bodily enter and perform assigned work; and</li><li>2. Has limited or restricted means for entry or exit (e.g. tanks, vessels, silos, storage bins, hoppers, vaults, etc.); and</li><li>3. Is not designed for continuous occupancy by any personnel (for example, a human could not occupy the space during normal operating conditions)</li></ol>
<b>Double Block and Bleed:</b>	<p>The closure of a line, duct or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.</p>
<b>Emergency:</b>	<p>Any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants or attendant(s).</p>
<b>Engulfment:</b>	<p>The surrounding and effective capture of a person by a liquid or flowable solid.</p>
<b>Entry:</b>	<p>The action by which a person passes through an opening into a confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.</p>
<b>Entry Permit:</b>	<p>The written document provided by the entry supervisor to allow and control entry into a permit required space. Valid for one shift only; must be posted at the entrance of the space. A copy of the permit should be retained for one year for audit verification purposes.</p>
<b>Entry Supervisor:</b>	<p>The person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry, overseeing entry operations, and for terminating entry. The entry supervisor may or may not have the formal title of supervisor.</p> <p><b>Note:</b> An entry supervisor may also serve as an attendant or as an authorized entrant as long as that person is trained and equipped as an authorized entrant. Also the duties of the entry supervisor may pass from one individual to another during the course of the entry operation.</p>



- Hazardous Atmosphere:** An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury or acute illness from one or more of the following:
1. Flammable gas, vapor, or mist greater than 10% of the lower flammable or explosive limit (LFL or LEL);
  2. Airborne combustible dust at a concentration that meets or exceeds its LFL;
- Note:** This concentration may be approximated as a condition in which the combustible dust obscures vision at a distance of 5 feet (1.5 meters) or less;
3. Atmospheric oxygen concentration below 19.5% or above 23.5%;
  4. Atmospheric concentration in excess of the occupational exposure limit for any substance that is capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects and which could result in employee exposure in excess of its dose or permissible exposure limit;
  5. Any other atmospheric condition that is immediately dangerous to life or health (e.g. heat).
- Hazard Identification/ Risk Assessment/ Determination of Controls (HIRADC):** A systematic risk management process in which a team reviews a task to identify potential hazards, assesses the risk based on likelihood and potential severity, and defines control measures to reduce risk to a tolerable level. Each FCX operation has defined a HIRADC process consistent with OHSAS 18001 and the FCX guideline titled Hazard Identification and Risk Assessment- FCX-09.
- Hot Work Permit:** A written authorization to perform operations (e.g. riveting, welding, cutting, burning, and heating) capable of providing a source of ignition. (See Freeport-McMoRan Hot Work & Permit Guideline FCX-06.)
- IDLH (Immediately Hazardous to Life or Health) :** Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a confined space. Guidance on IDLH values is available from Material Safety Data Sheets and H&S regulatory agencies. The US National Institutes of Occupational Safety & Health (NIOSH) publishes guidance on IDLH values in NIOSH's online Pocket Guide to Chemical Hazards (refer to [www.cdc.gov/NIOSH](http://www.cdc.gov/NIOSH)). Always consult with area Health and Safety representatives before dealing with any conditions associated with IDLH.
- Isolation:** The control of all energy sources such that the potential for exposure does not exist. Examples of isolation may include: blanking of supply lines, a double block and bleed system, lockout/tagout/tryout of all sources of energy, and blocking or disconnecting all mechanical linkages.

**LFL / LEL (Lower Flammable Limit / Lower Explosive Limit):** The minimum concentration of a gas, vapor or dust in air (expressed in percent volume), which will ignite if an ignition source is present.

**Lifeline:** In contrast to retrieval lines, the purpose of a lifeline is to prevent the user from being engulfed due to voids in loose, unconsolidated material. Self-retracting lifelines that rely upon fall speed in order to lock may not be used in this application. Anchor points must be selected to ensure that the user's torso remains above the original level of the material.

**Non-Permit Confined Space:** "Non-permit confined space" means a confined space that does not contain any hazard capable of causing death or serious harm, and does not have the potential to contain any atmospheric hazard capable of causing death or serious harm.

**Permit Required Confined Space:** "Permit-required confined space" means a confined space that has one or more of the following characteristics:

1. Contains or has a potential to contain a hazardous atmosphere;
2. Contains a material that has the potential for engulfing an entrant;
3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
4. Contains any other recognized serious safety or health hazard.

**Qualified Person:** An individual who, through combined education, training, experience, and process knowledge, has demonstrated that he/she is capable of recognizing, evaluating, and effectively identifying controls to reclassify confined spaces.

**Reclassification:** A space classified as a permit-required confined space may be reclassified as a non-permit confined space under certain procedures where permit required definition hazards have been eliminated before work begins. Reclassification can be temporary or permanent. In either case, the change in status must be documented in writing and must follow the SOP for reclassification. See Section IV, C for details.

**Retrieval System:** Equipment (including a retrieval line, full-body harness, wristlets if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

**Serious Health or Safety Hazard:** Any condition that poses an immediate or delayed threat to life, or that would cause irreversible health effects or that would interfere with an individual's ability to escape unaided from a permit space. Examples include but are not limited to heat, electricity, and falls.

### III. Responsibilities/Duties

#### A. Area Management who control confined spaces or entries will:

1. Ensure compliance with this guideline and procedure.
2. Ensure that all confined spaces within their division or areas under their control are identified and properly labeled, such as:

**Danger - Confined Space  
Follow Confined Space Procedure**

3. Include the inventory of the permit required spaces when they have been surveyed and identified, with site guideline & procedure.
4. Conduct a Hazard Identification / Risk Assessment / Determination of Controls (HIRADC) on these spaces and document the resulting control plan in a Safety Operating Procedure or similar document prior to initiating any entry.
5. Ensure that all persons involved with the confined space entry program are properly trained. This will include awareness training, task training for entrants, attendants, and entry supervisors, and training outlined in Section VIII.
6. Provide necessary resources and equipment needed to implement and maintain the confined space entry program.
7. Ensure that contractors working within confined spaces meet or exceed the requirements of this guideline.
8. Take effective measures to prevent employees from entering the permit spaces if the operation does not allow entry into permit spaces.
9. Ensure that affected employees who are trained in confined space rescue practice permit space rescues at least once every 12 months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from actual permit spaces or from representative permit spaces. Representative permit spaces shall simulate the types of permit spaces from which rescues are to be performed (with respect to opening size, configuration, and accessibility). Refer also to Section VII – IDLH Procedures. Operations that rely entirely on offsite professional emergency services for confined space rescue are exempt from this requirement.
10. Where off-site professional emergency services are used as a confined space rescue resource, evaluate the prospective rescuer's ability to effectively respond to a rescue summons in a timely manner. This evaluation must consider the hazards and types of confined spaces at the operation. Refer also to Section VII – IDLH Procedures. Inform the selected service of the operation's intention to use their services, and establish a method for communicating when entries are planned and occurring.

11. Conduct an annual review of permit-required confined space entries and associated permits with the purpose of identifying problems or issues that have arisen and which need to be resolved going forward.

## **B. Permit-Required Confined Space Entry Team**

### **B (1) Entry Supervisors will:**

1. Ensure that an effective Hazard Identification / Risk Assessment / Determination of Controls (HIRADC) assessment has been conducted on the entry, and that acceptable entry conditions are defined. This includes hazards which may result from work activities within the space.
2. Conduct the pre-entry meeting to ensure complete communication with all involved or impacted.
3. Ensure that the required atmospheric tests are performed in the confined space and results recorded on the permit prior to entry authorization. Ensure testing is conducted immediately prior to the entry to accurately reflect conditions at the time of entry. Ensure that follow-up testing is conducted and recorded per Section V of this guideline.
4. Verify that all procedures and equipment listed on the permit are in place and that acceptable entry conditions are met.
5. Verify that rescue services have been notified and are available, and that the means for summoning them are operable.
6. Verify all training requirements for a specific confined space entry have been met.
7. Authorize entry by signing the entry permit after all conditions for safe entry have been met.
8. Post the completed, signed permit at the entrance to the space
9. Ensure acceptable entry conditions exist initially and that conditions remain acceptable throughout the duration of the entry.
10. Terminate the entry and cancel the permit when entry operations covered by the entry permit have been completed or when uncontrolled hazards arise in or near the permit space.
11. Refer to Section VII in the event an IDLH condition is encountered.
12. Maintain each original canceled permit according to the FCX Records Retention Policy for use in the site's annual review of the Confined Space Entry Program.

### **B (2) Attendants will:**

1. Be familiar with the controlled or potential hazards of the confined space during the entry, including

route of exposure for chemical hazards, e.g., inhalation, skin absorption, etc.; and signs, symptoms, and consequences of over exposure.

2. Be familiar with the currently defined “acceptable entry conditions” for the confined space.
3. Look for any behavioral changes as a result of the effects of exposure in authorized entrants.
4. Be capable of speaking and communicating effectively with the employees working in the confined space and with potential rescuers.
5. Continuously maintain an accurate count of authorized entrants by name in the permit space.
6. Remain outside the permit space until relieved by another attendant, and/or job activities are completed.
7. Communicate with the authorized entrants as necessary to monitor entrant status and to alert the entrants of the need to evacuate the space.
8. Monitor activities inside and outside the space. Evacuate the space immediately when any one of the following takes place:
  - a. The attendant detects a non-acceptable entry condition (reference definitions)
  - b. The attendant detects behavior changes in entrants
  - c. The attendant detects a situation outside the confined space that may endanger the entry team
  - d. The attendant cannot effectively perform all the duties
  - e. Atmospheric monitor detects an air contaminant that exceeds the defined acceptable entry conditions  
**Note:** Alarms on monitors should be adjusted to match the acceptable entry conditions. For example, if half-face respirators are in use for sulfur dioxide, and the acceptable entry condition is defined as 10X the exposure limit for sulfur dioxide, the alarm point should be set accordingly. Otherwise, the alarm may sound continuously.
  - f. If an entry team suspects that an alarm is due to a malfunctioning monitor, the team must respond as if the monitor is accurate until it can demonstrate otherwise  
**Note:** Alarms must never be ignored
9. Keep unauthorized personnel from entering or approaching the permit space.
10. Perform no duties that might interfere with the attendant’s primary duties (monitoring and protecting authorized entrants).
11. Be present and tend any retrieval lines.
12. Ensure that entrants’ lifelines remain taut when entrants enter bins, hoppers, silos, tanks, and surge piles where unconsolidated material is stored, handled, or transferred.
13. Summon rescue / emergency services as soon as the attendant determines that entrants may need assistance to escape from a permit space hazard. Attendant may initiate non-entry rescue using the



retrieval system if it can be done without endangering the attendant.

### **B (3) Entrants will:**

1. Be familiar with the controlled or potential hazards of the confined space during the entry, including route of exposure for chemical hazards, e.g., inhalation, skin absorption, etc.; and signs, symptoms, and consequences of over exposure.
2. Be familiar with the currently defined “acceptable entry conditions” for the confined space.
3. Communicate with the attendant.
4. Alert the attendant whenever the entrant recognizes any warning sign or symptom of exposure to a hazardous situation, or the entrant detects a prohibited condition.
5. Exit from the permit space whenever:
  - a. Atmospheric monitor detects an atmosphere that falls outside of the acceptable entry conditions
  - b. The monitor stops functioning normally
  - c. An uncontrolled hazard is suspected or observed
  - d. An entrant experiences signs or symptoms of exposure to hazards
  - e. The communication link between the entrant and attendant is broken
  - f. When conditions outside the space threaten the entrants or attendant
  - g. The attendant calls for an evacuation
6. Each authorized entrant into a permit required confined space shall use a full body harness at all times. A retrieval line shall be attached to the safety harness when its use could assist with a possible rescue and it doesn’t create an additional hazard during the entry. Wristlets may be used in lieu of full body harness if the entry supervisor determines the use of the full body harness is infeasible or creates a greater hazard and the use of wristlets is the safer alternative.
7. Entrants must don and utilize a lifeline and a harness (or other means of affixing a lifeline) when entering bins, hoppers, silos, tanks, and surge piles where unconsolidated material is stored, handled or transferred. Self-retracting lifelines that rely upon fall speed in order to lock must not be used. Anchor points must be selected to ensure that the user’s torso remains above the original level of the material.

### **C. Health and Safety Department will:**

1. Audit confined space entry program compliance.
2. Administer and maintain the Confined Space Entry Program including a comprehensive list of confined spaces.
3. Ensure atmospheric testing equipment is properly calibrated and maintained.

4. Coordinate specialty training in atmospheric testing and health hazards associated with confined space entry.
5. Maintain adequate rescue capability (on-site team or 3rd party team) for all confined spaces on property.
6. Participate in annual review of program and cancelled permits.

#### **D. Contract Personnel will:**

1. Meet or exceed the requirements of this guideline.
2. Provide employees who have documented training in confined space entry and have been deemed “qualified” (or competent).
3. Conduct atmospheric monitoring using their equipment. Where the contractor has the capability to conduct monitoring using their equipment, they must provide proof of calibration of monitoring equipment before use.

**Note:** Atmospheric monitoring may be conducted by site personnel provided that arrangements have been made in advance, that there is agreement by all parties to do so, and that the resources are available to perform that function.

## **IV. Procedures**

When entrance into a confined space is required, one of the procedures listed below must be followed (when in doubt, use the permit-required procedure). Always follow any existing Safe Operating Procedures for the space being entered. All employees who are part of the Confined Space Entry Team must be trained in confined space entry.

### **A. Entry Procedure for Non-Permit Required Confined Space**

Document the basis for determining that all hazards in the space have been eliminated, by using the top portion of the Confined Space Entry Permit or through a certification that contains the date, the location of the space, and the signature of the person making the determination. This documentation shall be made available to each employee entering the space or to that employee's authorized representative.

1. **Evaluate the Space:** Entry team must evaluate the space using the hazards checklist on the Confined Space Entry Permit and the site's Hazard Identification / Risk Analysis / Determination of Controls process (HIRADC) to ensure that there are no potential (possibility of forming, or created by work activities in the space) or actual hazards in the space.

Note: If potential or actual hazards exist, follow the permit-required confined space entry procedures.

For example: If welding, torch cutting, burning, painting, applying solvents, or similar activities will take place in the space.

2. **Prevent Unauthorized Entry:** Prevent unauthorized or accidental entry into the space by placing temporary railing, cones or other devices around the space opening in accordance with the Freeport-McMoRan Guarding, Flagging and Open Hole Guideline (FCX-1).
3. **Identify and Isolate/Eliminate all Energy Sources:** Identify and isolate or eliminate all energy sources that could enter the space according to the DOHS Guideline titled, "Lockout/Tagout (LOTOTO); Control of Hazardous Energy Sources" (FCX-04), before employees enter. All pipes entering the space must be broken or double blocked and bled.

Note: Energy sources are not limited to electrical hazards and can include fluids, mechanical hazards, stored energy, etc.

4. **Follow the written Safe Operating Procedure** for the space being entered (where applicable).

## B. Entry Procedure for Permit Required Confined Space

Define the acceptable entry conditions for the confined space. Document the basis for determining that all hazards in a permit space have been controlled to a suitable level, by using the Confined Space Entry Permit. The document shall be posted at the entrance and made available to each employee entering the space or to that employee's authorized representative.

1. **Evaluate the Space:** Entry team must evaluate the space using the hazards checklist on the Confined Space Entry Permit and the site's Hazard Identification / Risk Analysis / Determination of Controls process (HIRADC) to determine the actual hazards or potential hazards (possibility of forming, or created by work activities in the space) or in the space and the appropriate control measures that need to be taken.
2. **Prevent Unauthorized Entry:** Prevent unauthorized or accidental entry into the space by placing temporary railing, cones or other devices around the space opening in accordance with the Freeport-McMoRan Guarding, Flagging and Open Hole Guideline (FCX-1).
3. **Identify and Isolate/Eliminate all Energy Sources:** Identify and isolate or eliminate all energy sources that could enter the space according to the DOHS Guideline titled, "Lockout/Tagout (LOTOTO); Control of Hazardous Energy Sources" (FCX-04), before employees enter. All pipes entering the space must be broken or double blocked and bled.

**Note:** Energy sources are not limited to electrical hazards and can include fluids, mechanical hazards, stored energy, etc.

4. **Designate and Authorize:** Designate authorized entrants, attendants, and an entry supervisor. These employees must be trained in confined space entry, including training on their role on the entry team (supervisor, attendant, or entrant). At least two persons shall be assigned to the confined space work with one person acting as the attendant outside the confined space, one person working within, with one of them assuming the duties of entry supervisor.

**Note:** At least one attendant must be provided outside the permit space for the duration of entry operations. The attendant must never leave their post outside of the space while an entrant is in the confined space and must not perform other work while acting as the attendant. The attendant and entrants must remain in continuous communication with each other at all times.

5. **Pre-Task Meeting:** The Entry Supervisor will perform a pre-task meeting for all Entrants, Attendants, and any other employees who may affect conditions of the confined space to explain the hazards, acceptable entry conditions, required PPE, testing and communication procedures.
6. **Notify Rescue Services:** Notify rescue services of planned entry to ensure availability and to inform them of location and hazards involved. If rescue services are not available the confined space entry may not continue.
7. **Ventilation:** Purge, flush or ventilate the permit space as necessary to eliminate or control atmospheric hazards. These activities must be performed from outside the confined space. Ventilate continuously whenever the work inside the space will put contaminants into the air; for example sandblasting, painting, solvent cleaning, welding.

**Note:** Inerting a space will control a fire/explosion risk, but it may also introduce an IDLH atmosphere, and may affect the operation of the test equipment. DO NOT enter an inerted space until consulting with your health and safety professional and determining appropriate measures and controls to proceed. Refer to the IDLH section of this document.

8. **Atmospheric Monitoring:** Test the atmosphere immediately prior to entry and conduct monitoring as described in Section V of this guideline.
9. **Equipment:** Provide the following equipment as necessary for safe work:
  - a. Personal Protective Equipment (skin, hearing, respiratory, eye protection)
  - b. Full body harness must be worn at all times. If the entry supervisor determines the use of the full body harness is infeasible or creates a greater hazard, wristlets may be used if they offer a safer alternative.
  - c. Retrieval line shall be attached to the safety harness when its use could assist with a possible rescue and it doesn't create an additional hazard during the entry.
  - d. Lighting equipment rated for explosive atmospheres if the potential for explosive atmospheres exist.
  - e. Ladders, ramps or other effective means for proper egress
  - f. Testing and monitoring equipment (rated for explosive atmospheres, if applicable)
  - g. Ventilation equipment (rated for explosive atmospheres, if applicable)
  - h. Communication equipment (rated for explosive atmospheres, if applicable)
  - i. Rescue and emergency equipment (rated for explosive atmospheres, if applicable)
  - j. Any other equipment necessary for safe entry into permit spaces

**Note:** Ensure the communication system/equipment between attendant and entrant, attendant and emergency providers and rescue equipment is fully functional prior to entry.

10. **Confined Space Permit:** Complete the permit and keep a copy posted at the space. A new permit must be completed at the start of each shift, when the entry crew changes. The permit will be updated anytime safety or health conditions inside the space change during entry.
  
11. **Evacuating the Space:** All entrants must immediately leave the space under the following conditions:
  - a. Atmospheric monitor detects an atmosphere that falls outside of the acceptable entry conditions
  - b. The monitor stops functioning normally
  - c. An uncontrolled hazard is suspected or observed
  - d. An entrant experiences signs or symptoms of exposure to hazards
  - e. The communication link between the entrant and attendant is broken
  - f. When conditions outside the space threaten the entrants or attendant
  - g. The attendant calls for an evacuation

**Note:** If a rescue becomes necessary, the attendant shall activate the emergency response process and may attempt non-entry rescue using the retrieval system. All personnel must remain outside the space; responders shall attempt non-entry retrieval if possible. If entry is necessary, only properly trained and equipped responders may enter the confined space.
  
12. **Closeout and Notify Appropriate Departments:** Notify the appropriate departments and rescue services after entry operations are complete.
  
13. **Review:** Review the entry operations to determine if measures taken were adequate to protect employees.

### **C. Procedure for Reclassification of Permit Required Confined Space to Non-Permit Required Confined Space**

1. If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated. (Control of atmospheric hazards through forced air ventilation does not constitute elimination of hazards.)
  
2. Based on the evaluation of the hazards, a qualified person shall classify the confined space as either a permit-required confined space (PRCS) or non-permit confined space (NPCS). All confined spaces shall be treated as permit spaces until determined to be otherwise.
  
3. A PRCS listed in the inventory may be “reclassified” as a non-PRCS, by entry supervisor, if all hazards, atmospheric and non-atmospheric, are eliminated prior to entry.
  
4. NPCSS shall be periodically re-evaluated to verify proper classification.
  
5. Any change of conditions in the space which introduces new hazards to the space shall require an immediate re-evaluation of the space before entry.



## V. Air Monitoring Procedure

1. Monitoring equipment shall be examined prior to use by performing a “bump test”, checking batteries, alarm settings, and calibration dates, etc. Air monitoring equipment will be calibrated per the manufacturer’s recommendations. A record will be kept by the individual making the calibration.
2. Prior to any person entering a permit required confined space, pre-testing of the atmosphere inside the confined space must take place. Testing may occur at various stages in the process (such as during ventilation to remove atmospheric hazards), but must be done immediately prior to entry. All confined space atmospheres must be pre-tested, in the following order:
  - a. **Oxygen Deficiency or Enrichment:** Confined spaces containing less than 19.5% oxygen shall be considered as oxygen deficient and hazardous. Entry shall not be made without self-contained breathing apparatus. Oxygen content over 23.5% shall be considered oxygen enriched and hazardous. Entry shall not be made.
  - b. **Flammable Gases:** Flammable gases may be present in a confined space that contains acceptable levels of oxygen, and toxic levels below exposure limits. Flammable gases such as acetylene, butane, propane, hydrogen, hydrogen sulfide, methane, natural or manufactured gases or vapors from liquid hydrocarbons can be trapped in confined spaces, resulting in a flammable or explosive atmosphere. An atmosphere shall be considered as flammable or potentially flammable or explosive if pre-entry tests show a concentration greater than ten percent (10%) of the lower explosive limit (LEL) of the flammable gas.

**Note:** When oxygen concentrations are less than 10% the readings obtained for the LEL may be inaccurate. Refer to the manufacturer’s recommendations for the appropriate actions in such instances.
  - c. **Toxicity:** If a toxic substance is determined to be in the confined space a Material Safety Data Sheet (MSDS) or other chemical information should be consulted for assistance in determining what type of personal protective equipment is required, the potential health effects, the Permissible Exposure Limits, and any other information needed to safely conduct the work. Refer to the FCX IH Field Guide for more information on exposure limits; in some cases FCX has adopted an exposure limit that is lower than regulatory requirements.
3. All permit required confined space atmospheres must be pre-tested at a minimum of three levels (top, middle, bottom) prior to any entry. This is necessary for the potential for layering of heavy and light gases and vapors.
4. If a potentially hazardous atmosphere exists in a space, prior to opening the cover, test the atmosphere around the opening, then gradually release/open the access-way while testing—if conditions indicate a risk to the person conducting the evaluation, back away to a safe point, then resume testing once levels have reached safe values. Pre-testing of the atmosphere should be through small cover openings or by cracking open the cover and utilizing a probe suction line attachment with the monitoring instrument.

**Note:** Consult manufacturer’s guidelines for delayed monitor response time when using probe suction lines.

5. Whenever hazardous atmospheres are identified or experienced, such information must be recorded on the entry permit, and communicated to other departments who may have occasion to enter such space.
6. If work has been interrupted for any time (e.g. lunch break), all air monitoring procedures outlined herein must be repeated before work is resumed.
7. Continuous monitoring is necessary if:
  - a. The atmosphere hazards have not been completely eliminated
  - b. New or additional atmospheric hazards result from the tasks being performed in the space
  - c. Unacceptable atmospheric conditions can re-occur within the space due, for example, to the near-by processes or activities

**Note:** To discontinue monitoring, none of the three atmospheric conditions (oxygen rich/deficient; toxic; >10% of LEL/LFL) can exist or have a potential to exist. For larger or more complex situations, an alternative is to utilize individual monitors that the entrant wears into the space.

## VI. Equipment Use

1. When work in wet or damp confined spaces is performed, all electrical equipment used shall be of a design so as to prevent moisture or water from accumulating in enclosures, circuit breakers, etc. To accomplish this, all connections, etc. shall be in “approved” enclosures. Ground fault interrupters shall be used.
2. Tanks or cylinders of compressed gases (acetylene, oxygen, etc.) other than breathing air are prohibited in confined spaces. Hose extensions, etc. shall be used when welding or cutting is required. All welding leads and cutting torch hoses shall be removed from the space when not in use.

## VII. IDLH Procedures

Confined spaces with an immediate danger to life or health (IDLH) should not be entered unless entry is a rescue performed by a properly trained and equipped emergency rescue team. IDLH spaces are those spaces that have an atmosphere that is oxygen deficient (less than 19.5%) or enriched (greater than 23.5%), or a flammable mixture that is greater than 10% of the LEL, or when the toxic gases have reached their IDLH limits. An example of the latter would be an instrument reading of 100ppm sulfur dioxide (SO<sub>2</sub>). The rescue team must meet the requirements defined below.

Situations may come up where personnel believe that it is necessary to enter an IDLH space for a reason other than a rescue, such as the prevention of a severe production interruption. In this case, all feasible efforts must be made to eliminate the IDLH atmosphere, such as purging with air or an inert gas, or by ventilating the space. If these efforts are not successful, and an IDLH space must still be entered to prevent a severe event, a Safety Professional with expertise in confined space entry and a Manager-level or higher department leader shall discuss the need for actually entering into the space. If entry is necessary then a plan of action will be developed and documented with a new permit, meeting the requirements defined below.

#### IDLH Entry Requirements:

1. Use of any electrical equipment in areas where a flammable atmosphere exists must be intrinsically safe. This determination is made during the pre-entry atmosphere survey. An atmosphere reading 10% of the lower explosive limit (LEL) shall be considered a flammable atmosphere for these purposes.
2. Entrants use respiratory protection (pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA) and skin protection that is appropriate for the IDLH atmosphere.
3. One trained attendant or, when needed, more than one trained attendant is located outside the IDLH atmosphere;
4. Visual, voice, or signal line communication is maintained between the entrants and the attendants located outside the IDLH atmosphere;
5. A backup rescue team is located immediately outside the IDLH atmosphere, and is trained and equipped with the following in order to provide prompt and effective emergency rescue:
  - a. Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and
  - b. Appropriate skin protection for the IDLH atmosphere
  - c. Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry

## VIII. Training

Confined Space Entry Training shall be provided to all employees entering confined spaces.

1. The training shall consist of:
  - a. This guideline and procedure
  - b. Relevant regulations and standards
  - c. The use of all equipment for safe entry
  - d. Air monitoring equipment use and procedures
  - e. Emergency procedures
  - f. Hazards of confined spaces
  - g. Review of energy control procedures
  - h. Roles and responsibilities of parties involved
  - i. IDLH conditions – what might create an IDLH condition, and the requirements to work under IDLH conditions
  - j. Locations of confined spaces in the employees' work area
  - k. Non-entry emergency rescue/retrieval from confined spaces
2. Annual refresher training shall be provided to entrants, entry supervisors, and attendants and shall cover the topics above in a format that ensures that appropriate levels of knowledge continue. In addition,

refresher training shall include information or “lessons learned” from the annual review of entries.

3. Awareness training shall be provided to all employees and shall consist of informing employees that a guideline and procedure exists and must be followed, recognition of confined spaces and confined space danger signs, and resources for further information.
4. Training shall be documented.

## IX. Records

The following records must be retained according to the FCX Records Retention Policy:

- Employee Training Records
- Confined Space Permit
- Annual program review
- Calibration Records
- Equipment inspection records

## Revision History

2009 Rev 1	Initial Release	
2012 Rev 2	This update includes many changes from the previous version, some minor and some significant. As a result, it should be considered a complete re-write of the document. Users should review it in its entirety.	<ol style="list-style-type: none"> <li>1. Corrects errors in the previous version</li> <li>2. Clarifies “Hazardous Atmosphere” and “Acceptable Entry Conditions”</li> <li>3. Encourages operations to use their Hazard Identification / Risk Analysis / Determination of Controls process with confined space entry</li> <li>4. Clarifies links with other FCX guidance documents</li> <li>5. Clarifies entries involving conditions that are Immediately Dangerous to Life or Health</li> <li>6. Clarifies expectations on emergency response training, capabilities, and drills for internal CS rescue teams</li> <li>7. Clarifies expectations for sites that rely on external confined space rescue resources</li> <li>8. Clarifies retrieval lines (used for non-entry rescue) and lifelines (used to protect and entrant from engulfment hazards)</li> <li>9. Updates forms that are provided as examples</li> </ol>

Confined Space Survey Form (Non-Mandatory)	
Space Description:	Department:
Location:	Name/Equipment#:
Date:	
Person(s) Performing Survey:	
_____	signature _____
_____	signature _____
_____	signature _____
_____	signature _____

**SECTION I - CONFINED SPACE DETERMINATION**

YES	NO	Is the "space" large enough and so configured that an employee can bodily enter and perform assigned work? ( Note : Primarily intended for full or whole body entry)
YES	NO	Does the space have limited or restricted means for entry or exit (i.e. Tanks, vessels, silos, storage bins, hoppers, and vaults)? (Note: Doorways and other portals through which a person can walk are not considered to be limited means for entry or exit.)
YES	NO	Is the space <b>NOT</b> designed for continuous employee occupancy? (Note: answer NO if the space is designed for people to be able to occupy it, even during normal operating conditions.)

**If all three (3) answers are YES, this is classified as confined space, proceed to Section II.**

**SECTION II – DETERMINING PERMIT REQUIRED CONFINED SPACE**

YES	NO	Contains, or has a potential to contain, a hazardous atmosphere (Note: Exposures to combustible dusts or flammable mixtures, oxygen deficiencies, that may expose employees to the risk of death, incapacitation, acute illness or impair self-rescue)
YES	NO	Contains a material that has the potential to engulfing an entrant (Note: Primarily liquid or finely divided (flowable) solid)
YES	NO	Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a sloping floor.
YES	NO	Contains any other recognized serious safety or health hazard (Note: May include radiation, noise, electricity, and moving parts of machinery)

**If any of the four (4) answers is YES, this is classified as a permit required confined space.  
Complete a permit system form.**



Equipment needed (i.e. Air lines, lifelines, harness, mechanical apparatus, ventilation, respiratory protection, protective clothing, retrieval systems, barriers, explosion proof equipment, ground fault circuit interrupters, etc.)

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Final Action to achieve acceptable entry conditions and for completing "Entry Permit" (i.e. testing atmospheric condition, acceptable measurement levels, equipment available, insuring entrants and attendants are aware of acceptable entry conditions, completion and authorization of the permit, etc.)

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Confined Space Entry Training confirmed?  YES  NO

## EXAMPLE CONFINED SPACE ENTRY PERMIT

DIVISION:	DEPARTMENT:
LOCATION OF CONFINED SPACE:	DATE:
SHIFT: DAY NIGHT	CONFINED SPACE ID#:
ENTRY SUPERVISOR NAME:	APPROVAL SIGNATURE:
ENTRY ATTENDANT(S) NAME(S):	
AUTHORIZED ENTRANT(S) NAME(S):	

If 'NO' to all questions in Section A (below), this space may be classified as a Non-Permit Required Confined Space (sign below)  
 Name \_\_\_\_\_ Signature \_\_\_\_\_

STEP 1 – ARE HAZARDOUS ENERGY SOURCES / CONDITIONS PRESENT?					
Section A – Hazard Checklist			Section B – Hazard Checklist		
YES	NO	HAZARD	YES	NO	HAZARD
		Hazardous Atmosphere (including the potential)			Pre-Opening Hazards
		Sloping or converging walls or floors			Flammables / Fire
		Engulfment / Entrapment			Toxic Gases / Corrosive Material
		Any other serious safety hazard			Hazardous Energy
Type of serious hazard:					Conditions Outside Space
<i>If yes to any question in section A (above) the space must be classified as PERMIT REQUIRED. Other serious safety hazards are those in which an injury of serious nature is reasonably likely to occur if specific controls are not applied.</i>					Falls / Falling Objects
					Lighting / Noise
					Biological Hazards
					Other

STEP 2 – PREPARATION PROCEDURES						
PRE-ENTRY AIR TESTING			DONE	PROCEDURE	DONE	PROCEDURE
GAS	ACCEPTABLE	READING				
Oxygen	19.5 - 23.5 %			Pre-Entry Checklist		Lighting / Hearing Protection
LEL	< 10 %			Oxygen Pre-Entry Reading		Thermal Protection
Toxics	< PEL / TLV			Chemical Cleanout Electrical		Hydraulic Protection
Other				Ventilation Purge Time		Radiation Protection
Date of last calibration:				Lock out / Tag out / Try out		Traffic Control / Barricading
Test Instrument and #				Mechanical Isolation		Pneumatic Isolation
				Fall Protection		Hot Work Permit

REQUIRED EQUIPMENT			
REQUIRED	EQUIPMENT	REQUIRED	EQUIPMENT
	Ventilator		Hand / Foot Protection
	Respirator		Body Protection
	Atmospheric Monitor		Ground Fault Provided
	Blocking Device		Lighting
	Harness		Spark-proof Tools
	Tripod - Emergency Escape Apparatus		Ladder / Safe Access
	Eye Protection		Fire Extinguisher
	Hearing Protection		Intrinsically Safe Radio / Phone
	Other:		

ACCEPTABLE ENTRY CONDITIONS			
DONE	ACTION	DONE	EQUIPMENT
	Review Permit with Attendant and Entrant		All Safety Equipment Available
	Entry Permit Posted at Portal		MSDSs Reviewed
	Preparation / Isolation Procedures Done		Pre-Opening Hazards Eliminated
	Traffic Control / Barricading Done		Employees Task Trained
	Attendant/Entrant Communication Tested		Atmospheric Tests Satisfactory
	CSE / Crews, Emergency Services		Surrounding Areas Free From Vapors and Other Hazards

CONTINUOUS ATMOSPHERIC MONITORING							
GAS	ACCEPTABLE	TIME	READING	TIME	READING	TIME	READING
Oxygen	19.5 – 23.5 %						
LEL	<10%						
Toxics	< PEL / TLV						
Other							

LEL = Lower Explosive Limit  
 PEL = Permissible Exposure Limit  
 TLV = Threshold Limit Value

Post Entry Cancellation of Permit by Confined Space Entry Supervisor \_\_\_\_\_

<b>Department of Health &amp; Safety Guidelines</b>		SOP NO.	FCX - 02
		REVISION NO.	1
		SUPERSEDES	Rev 0
<b>FALL PROTECTION</b>		TASK CLASSIFICATION	Highly Critical
			Critical
			Non-Critical
APPROVAL DATE – 01/27/2013	ORIGINAL DATE – 02/13/2009	RELEVANT SOPS –	

**1. PURPOSE**

To establish minimum requirements and procedures to protect employees and other persons conducting work at Freeport-McMoRan Copper & Gold properties from hazards associated with falling from one surface to another.

**2. POLICY**

The prevention of falls through installation and maintenance of permanent barriers is preferred in locations where routine work is conducted. In work areas that are under construction the use of substantial barriers (i.e. scaffold framing, wood handrails or properly installed cable rails) is an acceptable. In situations where this is not feasible and during non-routine work, other protective systems described in this document shall be applied to prevent fall injuries.

Edges of permanent walkways, platforms, and floors that expose personnel to a fall hazard of 4 feet (1.2 m) or more to a lower level must be protected by a standard guardrail system. The working edges of standard loading docks and rail platforms are excluded from this requirement.

Fall protection must be provided and used 100% of the time whenever persons are exposed to a fall hazard that could reasonably result in an injury to persons working at height. This includes:

- Any walking or working surface (either horizontal or vertical, including ladders) that is 6 feet (1.8 m) or more above a lower level
- Any walking or working surface that is less than 6 feet (1.8 m), but is above sharp objects, corrosive substances, entrapment hazards, moving machinery, or other significant hazards
- Work from a ladder at any height, including levels below 6 feet (1.8 m) if the person is required to place his center of gravity near one of the ladder rails or lean backward away from the ladder, increasing fall potential

Persons may climb ladders of 20 feet (6.1 m) or less without fall protection as long as they maintain three points of contact and control at all times. Persons may work from ladders without fall protection provided that:

1. Their feet are less than 6 feet (1.8 m) from the lower level,
2. The ladder steps are dry and clean,
3. The ladder is placed on a level surface, and
4. The person has effectively controlled remaining risks.

Employees, Competent Persons, and Supervisors must evaluate each situation to minimize fall hazards and associated risks.

Consult the regulations and interpretive documents of the US Occupational Safety and Health Administration (OSHA) for best practices regarding fall hazards and protective equipment that are not specifically addressed in this document.

These are available at [www.OSHA.gov](http://www.OSHA.gov). Key sections include:

- [1926.500\(b\)](#): Definitions
- [1926.501](#): Exposures that require fall protection
- [1926.502](#): Fall protection systems, criteria, and practices
- [1926 Subpart M Appendices](#): Various guidance
- [1926.451\(g\)](#): Fall Protection in Scaffolding
- [1926.760\(a\)](#): Fall Protection for Steel Erection
- [1926.453](#): Aerial lifts
- [1910.25](#), [1910.26](#), and [1910.27](#): Ladders

Refer also to the Flagging, Barricading, and Open Hole Guideline (FCX-02) and the Scaffolding Guideline (under development at the time of this revision) for guidance on those topics.

### 3. SCOPE

All employees, contractors, and visitors on FCX property or projects will comply with all elements of this fall protection procedure. Contractors working on the property/project may implement their own procedure that meets or exceeds this document's requirements.

This guideline does not apply to emergency response efforts and associated training and drills, as long as these activities are conducted according to recognized emergency response procedures and under the direct supervision of a person who is competent in emergency response procedures.

### 4. PROCEDURES

#### Permanent Guarding

Where routine work is conducted, permanent guarding shall be constructed and maintained. Permanent barriers must support 200 lb. (90 kg) of horizontal force, and include a standard railing with standard toe board on all exposed sides. Permanent guarding shall not be removed unless the fall hazard is controlled by other means.

#### Personal Fall Protection Systems

##### General Requirements:

Components of personal fall protection systems must be manufactured according to recognized quality standards (e.g. ANSI in the United States) and must have the manufacturer's label attached. Fall protection components must be used according to manufacturer's recommendations and instructions.

Each user of a personal fall protection system must inspect all components of the system prior to each use for wear, damage, adequate flexibility, and other signs of deterioration. Defective components will be removed from service and either be secured until repair is completed or be made inoperable. Any component that is missing the manufacturer's label will be removed from service until the label is replaced under the direction of the manufacturer.

Pre-use inspections will follow the manufacturer's recommendations and will include inspection of the following (where relevant):

- Braids and webbing
- Stitching

- Conditions of grommets, buckles, and hardware
- Presence and legibility of manufacturer's date tag, serial number, and other critical markings
- Cleanliness, broken strands, burns, excessive wear, and dirt
- Fall indicators (see manufacturer's recommendations)
- Wear indicators (for example, some manufacturers include red threading inside webbing to indicate excessive cuts or fraying)

Permanently installed systems, such as horizontal and vertical lifelines and trolley systems, will be placed on formal preventative maintenance schedules in accordance with manufacturer's recommendations.

Personal fall protection equipment will be stored in a manner that prevents exposure to chemicals, excessive sunlight and weather.

Harnesses and body belts (where permitted) must be sized properly for the user and must be used according to manufacturer's specifications. The user must properly adjust this equipment prior to each use. Body belts must be at least 1 5/8 inches (4.1 cm) wide. **Note: Body belts may not be used in fall arrest systems.**

All connectors and components must have strength sufficient to withstand the maximum possible impact load on the system. Refer to the anchorage requirements for each system below.

Components should be selected to be compatible with the conditions of use. For example, lanyards used by welders should be constructed of wire rope rather than synthetic rope.

All snap hooks shall require double action to open.

Lanyards shall not be attached to anchorage points by doubling back and attaching the snap hook to the lanyard unless approved by the manufacturer; beam straps, beam clamps and other connectors designed for the specific purpose will be used when appropriate. Knots shall not be tied in lanyards.

Body belts, harnesses, lanyards and other components shall be used only as part of a personal fall protection system and shall not be used to hoist materials.

Horizontal life lines may be installed by a Competent Person according to the manufacturer's requirements. Site-built systems must be designed, installed and used under the supervision of a Qualified Person, as part of a complete personal fall protection system, which maintains a safety factor of at least two. A tag indicating the maximum number of persons permitted on a life line must be affixed to each accessible end of the life line. In some situations, two lanyards or a Y-lanyard may be necessary to ensure 100% tie-off when passing support structures.

Vertical lifelines must have a minimum breaking strength of 5000 lb. (2300 kg). Only one person may be connected to each vertical life line. If rope grabs are used, they must be specifically designed and approved by the manufacturer for attachment to the type and size of life line in use.

When persons are unsure of the strength of an anchorage point they are using, they are required to contact their supervisor for assistance before connecting to it.

### Fall Arrest Systems

Fall arrest systems are used to minimize free fall distance and stop a fall at a tolerable deceleration rate.



Components of fall arrest systems include:

- Body harness (body belts may not be used in fall arrest systems)
- Anchorage capable of either:
  - Supporting 5000 lb. (2300 kg) for each person attached, or
  - Providing a safety factor of 2 for the maximum impact load that it might experience, as determined by a Qualified Person
- Lanyard that includes a deceleration device designed to limit the maximum arresting force on the user to 1800 lb. (820 kg). Only one deceleration device should be used in each system; shock absorbing lanyards may not be coupled together or be connected to self-retracting lifelines.

The fall arrest system must be set up to minimize free fall distance, to prevent contact with a lower level, and to minimize the potential for swinging. In any case, the maximum allowable free fall distance is 6 feet (1.8 m) and the maximum deceleration distance is 3.5 feet (1 m). This can be accomplished by selecting an anchorage that is as high as possible and is directly above the fall hazard, and by using the shortest practical lanyard or a self-retracting lifeline.

Guardrails and handrails may not be used as anchorage points for fall arrest systems unless they are specifically designed for that purpose.

Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for protection of personnel.

Users of fall arrest systems and supervision must plan for prompt rescue of personnel in the event of a fall, or shall use fall protection equipment that allows for self-rescue. In situations that might result in difficulty rescuing a person who falls (i.e. extreme height or suspension over hazardous conditions); a rescue plan must be developed before beginning work. If rescue might be delayed more than six minutes, a step loop or similar device should be incorporated into the harness to minimize the risk of suspension trauma.

All field fabricated anchorages will be designed, tested and installed under the supervision of a Qualified Person. Anchorages used to attach personal fall arrest systems will be independent of any anchorage being used to support or suspend platforms.

### Fall Restraint Systems

Fall restraint systems are used to prevent the user from reaching a fall hazard. Components include:

- Full body harness or body belt
- Anchorage capable of either:
  - Supporting at least three thousand 3000 lb. (1400 kg) of force, or
  - Supporting at least twice the maximum expected force that is needed to restrain the person from exposure to the fall hazard. (In determining this force, a Competent Person should consider site-specific factors such as the force generated by a person walking, leaning or sliding down the work surface.)
- Lanyard
  - Must be a fixed length to ensure that the user cannot reach the fall hazard
  - Deceleration devices and self-retracting lifelines may not be used in fall restraint systems because of their changeable length

The fall restraint system must be rigged in a way that eliminates the possibility of free fall. If the user is able to reach an edge and fall any distance, the system must be reconfigured (e.g. shorter lanyard) or a fall arrest system must be used.

### Positioning Device Systems

Positioning device systems are used to allow a person to be supported in a static position on an elevated vertical surface, such as a wall or a power pole and work with both hands free while leaning.

Components include:

- Body harness or body belt
- Anchorage capable of supporting the greater of:
  - 3000 lb. (1400 kg)
  - At least twice the potential impact load of a person's fall
- Lanyard or other connection that limits free fall to 2 feet (0.6 m) or less

The positioning device system must be rigged in a way that limits free fall to 2 feet (0.6 m) or less. This system may only be used for work on vertical surfaces. This is not an acceptable personal fall protection system for horizontal surfaces, such as platforms, aerial lifts and similar; fall arrest or fall restraint systems are appropriate for use on horizontal surfaces.

### **Other Fall Protection Systems**

Other fall protection systems are described in the OSHA standards noted above (e.g. warning line systems, nets and others). These systems are permitted in special circumstances, such as roof repair or steel erection, provided that:

1. The use is consistent with the requirements of the relevant OSHA standard
2. The user develops a written plan for the specific application
3. The plan is reviewed and approved by a Qualified Person, and
4. A thorough risk assessment identifies that this method is acceptable and no other means of protection is available

### **Work in Aerial Lifts and Mobile Platforms**

Personal fall protection systems must be utilized when working from aerial lifts and mobile platforms such as JLGs, man baskets, approved fork truck-mounted baskets, etc. Persons must never work outside the guardrails. Persons must never climb or stand on a guardrail.

Scissor lifts (those meeting ANSI 92.6) qualify as scaffolding. Personal fall protection is not required on scissor lifts, provided that:

1. A complete handrail / midrail / toe board system is present
2. The lift is used and operated according to the manufacturer's instructions, and
3. **Users do not leave the floor of the platform**

Scissor lifts that are mounted on mobile equipment (per ANSI 92.2) do not qualify as scaffolding; users must use personal fall protection systems when working from these lifts.

## 5. TRAINING

All training related to this guideline shall be conducted by a Competent Person.

### Awareness Training

All persons working on Freeport-McMoRan property will be made aware of this procedure before working where fall protection may be needed. All persons who may be required to use a personal fall protection system will receive training as noted below before they use it. All training will be documented.

### Pre-use Training

Persons using personal fall protection systems will receive specific training on the equipment they will be using. Training will include:

- This procedure
- The nature of fall hazards in the work area
- Inspection procedures
- Fitting procedures
- Limitations of fall protection systems
- Specific instruction on the fall protection equipment being used, per manufacturer's instructions

### Refresher Training

Affected persons will receive annual refresher training on the requirements of this procedure. More frequent training may be required for any trained persons who demonstrate a lack of understanding of the requirements of this procedure.

### Rescue Training

Sites that use fall arrest systems shall provide rope rescue training for existing response teams or, in cases where the site relies on local emergency service providers, the site shall confirm that the local emergency service providers have rope rescue capabilities and are familiar with the site.

## 6. DEFINITIONS

Anchorage means a secure point of attachment for lifelines, lanyards or deceleration devices.

Body Belt means a strap with means both for securing it about the waist and for attaching it to a lanyard or lifeline in a fall restraint system or positioning device system.

Body Harness means straps which may be secured about the person in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall protection system.

Competent Person means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to persons and who has authorization to take prompt corrective measures to eliminate them.

Deceleration Device means any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyard, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrestor otherwise limit the energy imposed on an person during fall arrest.

Deceleration Distance means the additional vertical distance a falling person travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an person's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall and the location of that attachment point after the person comes to a full stop.

Free Fall means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Free Fall Distance means the vertical displacement of the fall arrest attachment point on the person's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

Guardrail System means a barrier erected to prevent persons from falling to lower levels.

Lanyard means a flexible line of rope, wire rope or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline or anchorage.

Lifeline means a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (Vertical Lifeline) or for connection to anchorages at both ends to stretch horizontally (Horizontal Lifeline) and which serves as a means for connecting other components of a personal fall protection system to the anchorage.

Qualified Person means one who, by possession of a recognized degree, certificate or professional standing or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work or the project.

Self-Retracting Lifeline/Lanyard means a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal person movement and which, after onset of a fall, automatically locks the drum and arrests the fall.

Appendix C  
CH2MHILL Health and Safety Plan

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# CH2M HILL Field Safety Instructions for Ruby Mines Engineering walk-through Support — ESG Commercial Sector

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These off-the-shelf Field Safety Instructions (FSI) are limited in covering only CH2M HILL personnel performing site walks on industrial facilities (active or inactive) during pre-bid meetings or other similar activity. This does not apply to meetings in administrative buildings. This FSI is to be filled out and signed by all CH2M HILL attendees before going onto a site walk at a client facility. A copy of the completed FSI should be kept with the BD project file. **All CH2M HILL personnel must comply with the requirements listed in these instructions.**

## Project Information

**Client:** Freeport-McMoRan

**Client Contact Name and Phone Number:** Stu Brown (602) 448-0972

**Project/Site Name:** Ruby Mines Engineer walk-through Support

**CH2M HILL Project Manager:** Liz Dodge

**CH2M HILL Commercial Health and Safety Manager:** Jeffrey T. Hilgaertner (714) 552-1971

## Restricted Areas and Activities

Certain areas and activities are not covered and must not be entered or performed under these instructions. This includes confined space entry, entry into active construction or demolition zones, entry into excavations greater than four feet deep, unprotected edges with a fall hazard greater than four feet, areas where personal protective equipment (PPE) is required that personnel have not been trained on, access to areas that require use of scaffolding or aerial lifts, and any other activity that may require specific training, medical monitoring, or security measures.

## Injury and Illness Reporting

If any CH2M HILL employee is injured during a site walk, contact 911 if it is an emergency or for non-emergencies, contact the occupational nurse at **1-866-893-2514**. Immediately call the employee's supervisor and the Commercial Health and Safety Manager. Follow-up by entering a HITS report on the HSSE website.

## Client or Facility-Specific Requirements

The following information is to be determined by project staff based on client information, obtained either before arrival at the facility, or at the facility as part of initial meeting with site or facility representative.

### PPE required:

- Hard hat    Safety glasses    Safety-toed boots    Leather gloves    High-visibility vest  
 Hearing protection    Other (specify here): Long pants/sleeves and substantial shoes

### Training required (check all that apply):

- Client/ -Mine-Specific orientation  
 Specialized training required (e.g., hazwoper, **specify here**):

### Emergency response (specify procedures below):

#### What are the emergency alarms or signals for the site?

Verbal commands and instructions from Mine site personnel

#### What is/are the emergency evacuation route(s) and where are assembly areas?

Client personnel will provide this information at the beginning of site walk

#### List any other pertinent client safe work practices or rules to adhere to while onsite:

Obey all verbal instruction from mine personnel. Avoid walking on loose surfaces.

General Health and Safety Hazards and Precautions – REVIEW PRIOR TO THE SITE WALK

Hazard	Safe Work Practice & Precautions
<b>General operations.</b>	<ul style="list-style-type: none"> <li>• Wear footwear and clothing appropriate for site walk.</li> <li>• Observe and heed caution and warning signs.</li> <li>• Observe for tripping hazards or sharp edges of equipment or materials.</li> <li>• Do not ride freight elevators unless authorized by facility representative.</li> <li>• Do not jump from or onto loading docks or other elevated platforms</li> <li>• Smoke only in designated areas.</li> <li>• Note location of emergency eye wash and deluge shower locations.</li> <li>• Remain clear of machinery (operating or not), particularly in unguarded areas</li> <li>• Stay with facility or site escort at all times.</li> <li>• Bring insect repellent and sunscreen for outdoor site walks, if necessary.</li> <li>• Be familiar with symptoms of heat or cold stress and monitor self and others.</li> </ul>
<b>Powered fork lifts</b> are used in many larger facilities. A healthy respect and vigilant precautions are needed to avoid possible serious or fatal injury.	<ul style="list-style-type: none"> <li>• Walk in areas marked for pedestrian traffic.</li> <li>• Remain vigilant observing for fork lifts – use mirrors, look both ways at aisle intersections, and listen for audible warnings (horn or reverse signal alarm).</li> <li>• Stay Clear - obtain positive operator contact before approaching or crossing path of fork lift – wait until operator acknowledges your presence, stops movement, and signals as safe for you to proceed.</li> <li>• Never approach or proceed underneath a raised load.</li> <li>• Do not ride on fork lifts, nor use as personnel lifts.</li> </ul>
Many <b>Enclosed areas</b> are encountered in facilities, including boiler rooms, elevator control rooms, basements, and subbasements.	<ul style="list-style-type: none"> <li>• Confirm with facility representative that entry is safe.</li> <li>• Do not enter enclosed areas containing evidence of chemical spills or release, are not adequately lighted, or appear to contain other serious hazards.</li> </ul>
<b>Roof tops</b> are frequently visited to survey heating/AC equipment and storm drainage.	<ul style="list-style-type: none"> <li>• Remain on designated foot paths.</li> <li>• Remain at least 6 feet from any roof edge, unless guardrail or parapet provided.</li> </ul>
<b>Parking lots and facility &amp; public roads/vehicles</b> are commonly encountered.	<ul style="list-style-type: none"> <li>• Walk along edge of parking lots and roads, or in designated pedestrian ways</li> <li>• Remain vigilant for vehicle traffic.</li> </ul>
<b>Stairs/fixed ladders</b> are encountered in accessing chiller rooms, elevator control rooms, roofs, catwalks, and some subbasement structures.	<ul style="list-style-type: none"> <li>• Use handrails, and wait until the previous person is off.</li> <li>• Footwear for using ladders should have a defined, square heel.</li> <li>• Do not use defective ladders or ladders tagged as “unsafe”.</li> <li>• When climbing, user must face ladder, climb with both hands and keep belt buckle between side rails.</li> <li>• Fixed ladders <math>\geq 20'</math> in height must be provided with fall protection devices.</li> </ul>
<b>Electrical</b> enclosures and equipment (panel boxes, telephone circuits, transformers, machinery) are frequently encountered.	<ul style="list-style-type: none"> <li>• Do not open any electrical enclosures or remove covers.</li> <li>• Remain clear of any open electrical panels or boxes.</li> <li>• When entering electrical closets/rooms, ensure adequate lighting exists and do not contact any equipment.</li> <li>• Do not disturb lockout-tagout equipment.</li> </ul>
<b>Noise</b> areas are occasionally found in compressor rooms and around certain machinery.	<ul style="list-style-type: none"> <li>• Observe posted signs – wear hearing protection as posted.</li> <li>• As a general rule, if you are required to shout in order to converse with coworker, hearing protection is required.</li> </ul>
<b>Abandoned areas</b> are occasionally encountered inside buildings or on facility property.	<ul style="list-style-type: none"> <li>• Never enter abandoned areas that may present confined space hazards.</li> <li>• Only enter areas that are adequately lighted.</li> <li>• Avoid areas where vagrants may be residing.</li> <li>• Do not attempt to remove or work around animal life.</li> </ul>
<b>Chemical hazards</b> such as facility products and waste, unlabeled containers.	<ul style="list-style-type: none"> <li>• Avoid contact with chemical products, containers and their contents. Do not open any container of chemical products or waste.</li> <li>• Observe container label warnings and precautions</li> <li>• Do not smoke in chemical storage areas – smoke only in designated areas</li> <li>• Do not contact or attempt to identify any spilled chemical product or material</li> </ul>
<b>Site-Specific Hazards Noted</b>	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>



**Appendix D**  
**Example Warning Sign**

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**DANGER**

**UNAUTHORIZED PERSONNEL  
KEEP OUT**

**Ba' ha' dzid - Doo Ko' ne' na' ada' ada'  
(DANGER - NO TRESPASSING)**

**US EPA**



**RADIATION REMOVAL SITE**

Contact Navajo Super Fund Program For  
More Information At 1-800-314-1846  
Or USEPA At 1-800-231-3075