

Office of Environmental Management – Grand Junction



Moab UMTRA Project
Health and Safety Plan

Revision 8

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Moab UMTRA Project Health and Safety Plan

Revision 8

Review and Approval

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Revision History

Revision	Date	Reason for Revision
0	February 2008	Initial issue.
1	March 2009	Annual update.
2	October 2010	Annual review update and insertion of additional content in Sections 3.3.9 through 3.3.12.
3	November 2011	Revision includes replacement of contractor-specific procedures with Project procedures, removal of Attachment 1, and updated hospital route map.
4	August 2012	Revision includes updated RAC and TAC contract numbers, RAC signatories, RAC titles, and addition of new Section 2.2.2., ESH&Q Manager.
5	June 2014	Revision includes content changes in the introduction, accident investigation section, and electrical section. Revision also includes change to the approach boundary for unevaluated overhead power lines (increase to 20 feet rather than 10 feet), removal of the term Task Awareness Plan, description of changes regarding the GHS/HazCom Program, and editorial changes throughout.
6	April 2017	Revision includes modification of content in Section 4.3.3, Chemical Hazards Associated with Pile Excavation, to reflect the results of the <i>Industrial Hygiene Baseline Health Risk Assessment Report</i> (DOE-EM/GJRAC2157), modification of heat stress content (Section 4.3.6) to reflect ACGIH action levels on heart rate, updated PPE requirements in Section 5.0, and editorial changes throughout.
7	August 2018	Annual review update and insertion of additional content in Section 7.0, Safety and Health Training Program.
8	November 2019	Annual review and made changes to the EMR section to be consistent with DOE-EM-GJ2071 Emergency Medical Response Program and to include a revision to sections 7.2 Daily Safety Meetings and 7.3 Plan of the Day.

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1.0 General Information

1.1 Introduction

This Health and Safety Plan (HASP) has been prepared and issued by the Remedial Action Contractor (RAC) in conjunction with the Technical Assistance Contractor (TAC) for the U.S. Department of Energy (DOE) Moab Uranium Mill Tailings Remedial Action (UMTRA) Project in Utah.

This HASP has been designed to identify, evaluate, and control safety and health hazards and provide emergency response for hazardous waste operations. This HASP addresses the safety and health hazards of each phase of site operation and includes the requirements and procedures for employee protection.

The Project incorporates the requirements of Integrated Safety Management (ISM), which is the high-level program that encompasses the Moab UMTRA Project's Worker Safety and Health Program and sets forth the parameters for how the RAC and TAC integrate safety into Project activities.

The *Moab UMTRA Project 851 Worker Safety and Health Program Description* (DOE-EM/GJ3002) identifies procedures that govern Project activities, sets forth specific criteria that protect the worker, and steer safety elements of the Project. ISM is integrated into daily work activities by utilizing its Five Core Functions, which are:

1. Define the scope of work.
2. Identify and analyze hazards associated with the work.
3. Develop and implement hazard controls.
4. Perform work within controls.
5. Provide feedback on adequacy of controls and continue to improve safety management.

The effectiveness of the Project Integrated Safety Management System (ISMS) is ensured through worker involvement. This involvement is to occur at each stage of the implementation of the Five Core Functions, which are integral aspects of the Integrated Work Plan/Job Safety Analysis (IWP/JSA) process. Training is vital to this process.

Workers are trained to constantly look for ways to improve processes. In short, they are trained to "Think before Doing," and to: (1) understand the work, (2) understand the hazards, (3) understand the hazard controls, (4) work within the hazard controls, (5) recommend ways to improve the process, (6) be alert for changing conditions, and (7) raise questions and concerns if controls seem inadequate.

In this HASP, "contractor" refers to RAC or TAC. This HASP identifies hazards and defines health and safety policies and procedures for site workers (including subcontractors) performing work for the Project; it is also applicable to vendors and visitors.

Before performing work, a task-specific hazard analysis shall be performed and documented in an IWP/JSA. An IWP/JSA may reference a radiological work permit (RWP) or other controlling document(s) as appropriate for the work to be performed and hazards that are present (e.g., confined space entry permit).

Each worker shall receive a briefing on the applicable work control documents before the start of work. An IWP/JSA remains active for the duration of the task for which it was developed or until cancelled by the applicable RAC or TAC Operations/Site Managers or designee(s).

IWPs/JSAs are created by an IWP/JSA development team comprised of a cross-section of operations and safety personnel assembled by the RAC Operations/Site Manager or the TAC Technical Management Group/Field Manager, or their designees. An IWP/JSA development team should include supervisors and workers who have the level of skill and experience necessary to ensure the development of an accurate and effective IWP/JSA for the safe execution of work.

1.2 Scope of Work

The scope of the Project involves relocating the uranium mill tailings and other contaminated material from the Moab site to a permanent disposal cell at the Crescent Junction, Utah, site. The materials are being primarily transported by rail. The scope also includes active remediation of groundwater at the Moab site. Project work locations may include: the Moab site, the Crescent Junction disposal site, vicinity properties (off-site properties in the vicinity of the Moab site that may contain process-related materials from the former millsite), the Grand Junction, Colorado, office, and off-site operations.

1.3 Site Description and History

The Moab site is a former uranium ore-processing facility located about 3 miles northwest of Moab in Grand County, Utah. The Moab site is bordered on the north and west by steep sandstone cliffs. The Colorado River forms the southeastern boundary. U.S. Highway 191 intersects the northern site boundary, and State Route 279 intersects the western boundary. Arches National Park is located north of the site across U.S. Highway 191.

The Union Pacific Railroad (UPRR) traverses a small section of the site, west of State Route 279, before entering a tunnel; the track emerges several miles southwest of the site. The Moab Wash transects the site and joins the Colorado River. The entire site covers approximately 130 acres of land, and the tailings pile occupies 130 acres.

The Moab mill was operated from 1956 to 1984 by private companies. The milling operations created process-related tailings, a radioactive, sand-like material, and other mill-related radioactive waste. The tailings were pumped to an unlined impoundment in the western portion of the property that accumulated over time, forming a pile more than 80 feet belowground in its deepest section.

When the processing operations ceased, an estimated 12 million tons (9 million cubic yards) of mill tailings and tailings-contaminated material was present in the pile. An interim cover was placed over the tailings pile as part of decommissioning activities conducted between 1988 and 1995. Ultimately, by 2001, 16 million tons of tailings and other off-pile contaminated soils were represented in the pile.

Through congressional legislation, ownership and cleanup responsibility for the site were transferred to DOE in 2001. The legislation stipulated that the Moab site undergo remediation in accordance with Title 42 United States Code Chapter 7901 (42 USC 7901), the Uranium Mill Tailings Radiation Control Act. The site is regulated by the U.S. Nuclear Regulatory Commission.

The Crescent Junction site is located northeast of the junction of Interstate 70 and U.S. Highway 191, approximately 30 miles north of the Moab site. The major features of the Crescent Junction site are shown in Figure 2.

DOE withdrew land at Crescent Junction from the U.S. Bureau of Land Management (BLM) for a mill tailings and contaminated material repository and ancillary facilities (e.g., construction management trailers, parking, vehicle wash, construction water pond). An estimated 400 acres will be impacted by disposal activities. Once the disposal cell is completed, DOE will retain permanent ownership of the repository, a buffer area, and access to the repository; the remaining acreage will be returned to the BLM. The area that will be permanently withdrawn from other uses is approximately 200 acres. Figure 3 shows a DOE regulation and directives hierarchy triangle (see DOE Standard 1075-94, “Standard for Developing and Issuing DOE Safety Guides and Implementation Guides”).

1.4 Regulatory Scope

The hierarchy of the DOE regulation and directives documents is shown in Figure 3. DOE policy statements are the highest tier of DOE directives. All other requirements and guidance should flow from Departmental policy. The second tier includes the requirements documents, such as regulations, orders, and manuals, for implementing the top-level policy.

Although regulations cannot be overridden by DOE policy because they are enforceable by law, the rules developed by DOE should flow from DOE policy. The third tier includes the guidance documents (such as implementation guides and safety guides). The fourth and last tier includes technical standards that describe established practices and procedures that may be used to implement specific requirements or objectives.

The primary federal regulations governing the health and safety of on-site workers/contractors, subcontractors, and vendors are:

- Title 10 Code of Federal Regulations Part 851 (10 CFR 851), “Worker Safety and Health Program.”
- 10 CFR 835, “Occupational Radiation Protection.”
- 29 CFR 1910, “Occupational Safety and Health Standards – General Industry.”
- 29 CFR 1926, “Safety and Health Regulations for Construction.”

In addition, the Moab and Crescent Junction sites are also controlled in accordance with 29 CFR 1910.120, “Hazardous waste operations and emergency response” (HAZWOPER).

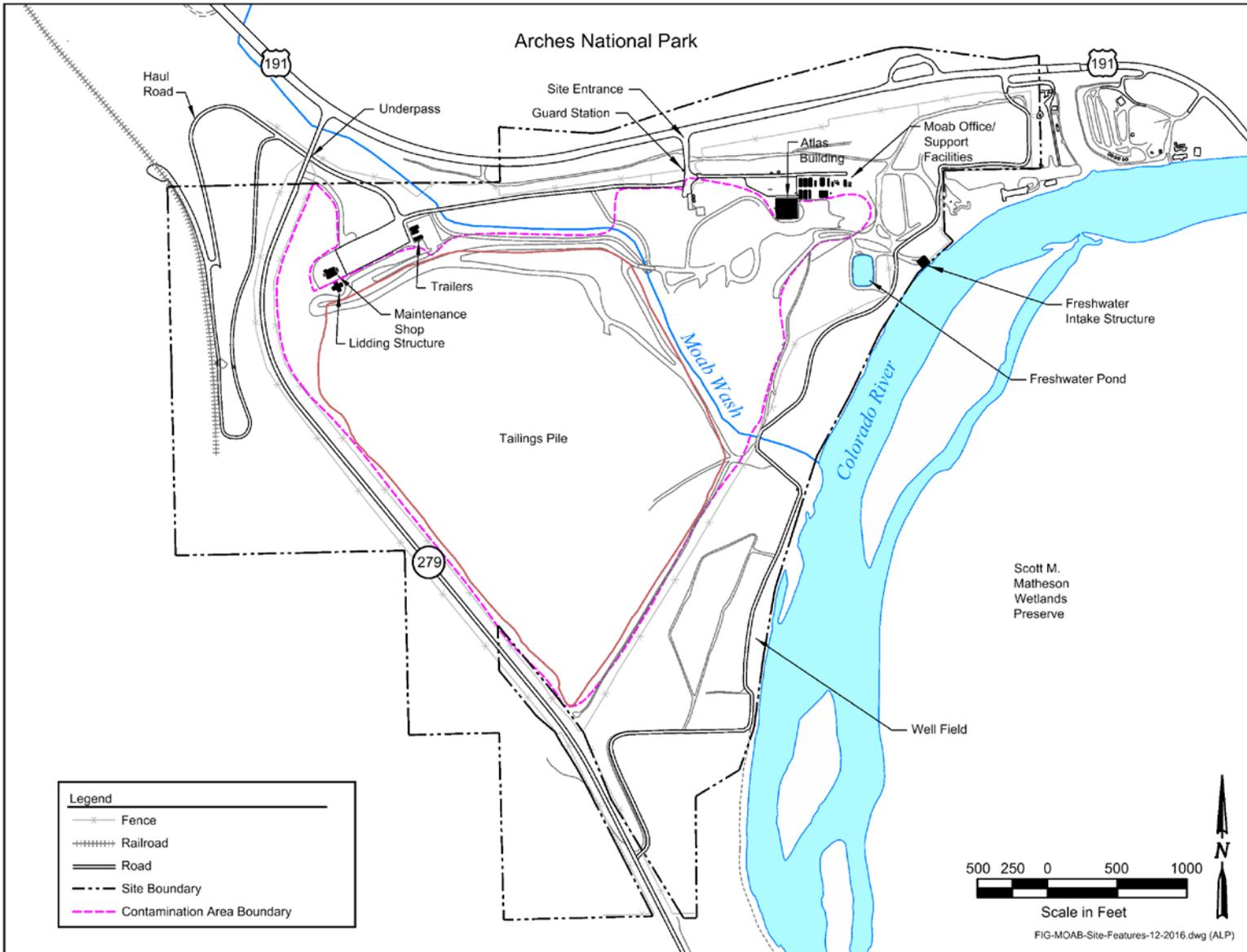


Figure 1. Moab Site Features

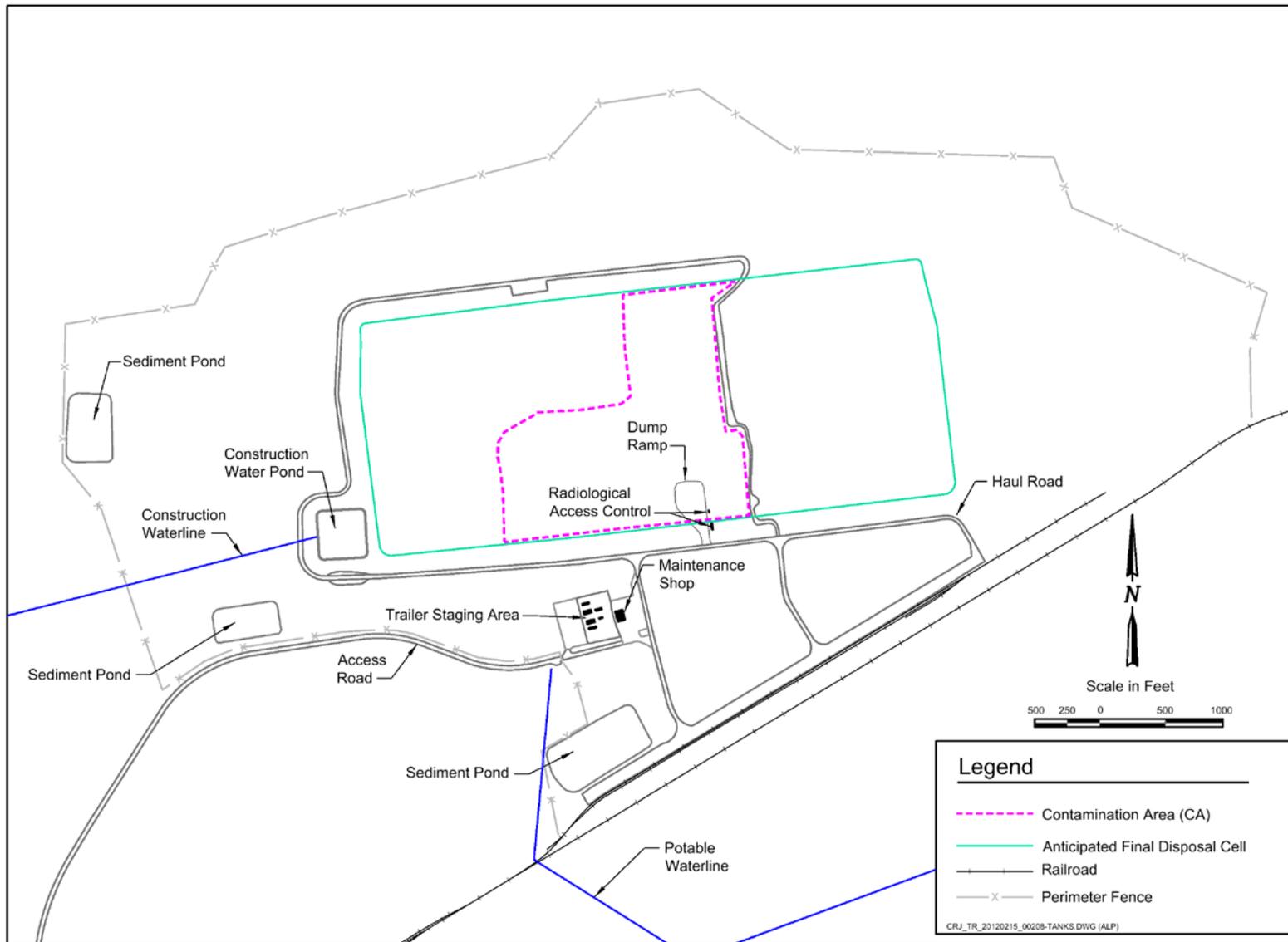


Figure 2. Crescent Junction Site Features

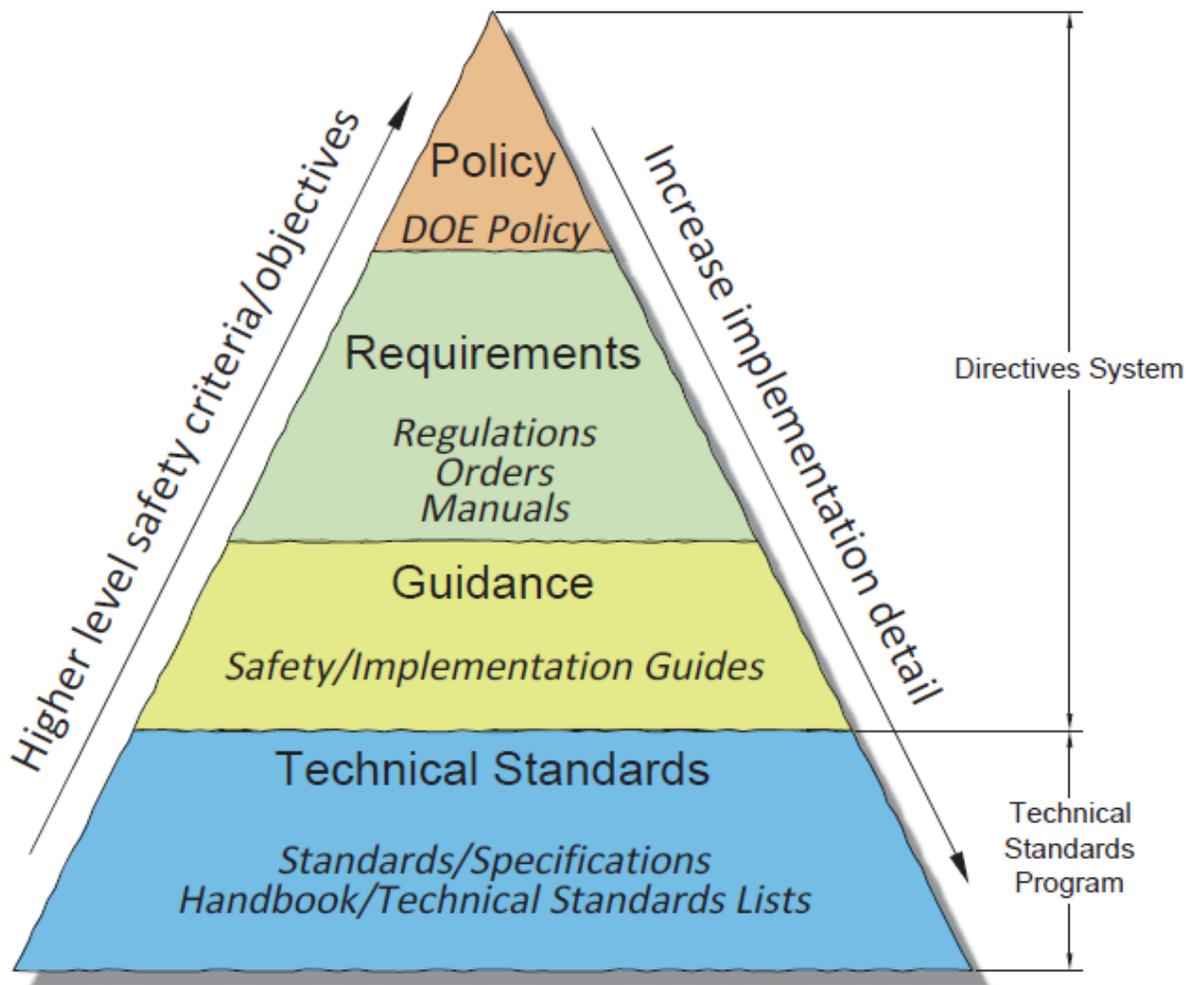


Figure 3. DOE Regulation and Directives Hierarchy Triangle

HAZWOPER regulations are applied in areas where hazardous waste operations are being performed with potential for uncontrolled hazardous waste substances may be encountered and when the RAC Health and Safety (H&S) Manager and/or TAC Health, Safety, and Training (HS&T) Manager and/or DOE Environment, Safety, Health, and Quality Assurance (ESH&QA) Manager determines HAZWOPER controls are necessary based on existing or new hazards.

1.5 Administrative Requirements

A copy of this HASP shall be kept on the Project's SharePoint website. The Health and Safety Program shall also be made available to any contractor or subcontractor or their representative who will be involved with the hazardous waste operation; to employees; to employee designated representatives; to Occupational Safety and Health Administration (OSHA) personnel, and to personnel of other federal, state, or local agencies with regulatory authority over the site.

1.5.1 HASP Changes

The information in this HASP shall be maintained current with site hazards and conditions. Revisions will be accomplished in accordance with the *Moab UMTRA Project Document Production Manual* (DOE-EM/GJ1531).

The information and data obtained from site characterization, monitoring, and analysis work shall be used to update the HASP.

1.5.2 Records

All documentation created as a result of compliance with this Plan is considered a Project record and will be managed in accordance with the *Moab UMTRA Project Records Management Manual* (DOE-EM/GJ1545), which follows DOE orders, policies, and regulations for retention and maintenance of records. An accurate record of the medical surveillance required by Section 8.0, Medical Surveillance, of this HASP shall be retained. This record shall be retained for the period specified and meet the criteria of 29 CFR 1910.120.

The record required shall include at least the following information:

- The name and social security number of the employee.
- Occupational medical physicians' written opinions, recommended limitations, and results of examinations and tests.
- Any employee medical complaints related to exposure to hazardous substances.
- A copy of the information provided to the examining physician by the Project.

2.0 Key Personnel

2.1 Organizational Structure Key Personnel

The positions critical to site operations are presented in Table 1. Emergency protocols are delineated in the *Moab UMTRA Project Emergency/Incident Response Plan* (DOE-EM/GJ1520), and organizations to be contacted in the event of an emergency are identified in the *Moab UMTRA Project Emergency Response Key Personnel/Agencies and Contact Information* (DOE-EM/GJ1757) (*Emergency Contact List*) located on the Project's SharePoint website. Personnel contacted will be determined by the type and severity of the emergency event. The organizational structure shall be reviewed and updated as necessary to reflect the current status of site operations.

NOTE: For a listing of names and contact numbers associated with Table 1, please see the *Emergency Contact List*, located on the Project's SharePoint website. For a detailed explanation of organizational structure and roles and responsibilities, see *Moab UMTRA Project Contractor Roles and Responsibilities* (DOE-EM/GJ3000). Where key positions are referenced throughout this document, they include either the listed manager or his or her appropriate designees.

2.2 Key Positions

This section provides an overview of DOE roles and responsibilities. If additional detail is needed, refer to the *Federal Integrated Safety Management System Description* (DOE-EM/GJF1637).

2.2.1 DOE Moab Federal Cleanup Director

The Moab Federal Cleanup Director (FCD) is responsible for leading, managing, and overseeing all business, personnel, safety, quality, and environmental management aspects of the Project.

The FCD is responsible for the safe operation and safety culture of the Project and ensures safety management systems, including the Environmental Management System (EMS), shall be used to systematically integrate safety into management and work practices at all levels so that work is performed within the approved controls, and missions are accomplished while protecting the public, the worker, and the environment.

2.2.2 DOE Deputy Federal Cleanup Director

The FCD may rely on a Deputy Federal Project Director (FCD) for responsibilities through delegation of authority, as appropriate. The Deputy FCD assists the FCD with all phases of Project technical oversight, direction, and safe operations and serves as the primary point-of-contact with the DOE Office of Environmental Management Consolidated Business Center (EMCBC) and the FCD for all activities associated with assigned projects.

2.2.3 DOE Contracting Officer’s Representative

The Contracting Officer’s Representative (COR) is the contractors’ primary point-of-contact. CORs maintain a high level of awareness of day-to-day site activities to advance the Project mission.

Table 1. Key Positions

DOE Personnel
DOE Moab FCD
Deputy FCD
COR – Moab and Crescent Junction
Site Engineer
ESH&QA Manager
Contractor Personnel
RAC Project Manager
RAC ESH&Q Manager
RAC Moab Operations/Site Manager
RAC Crescent Junction Operations/Site Manager
RAC H&S Manager
RAC Radiological Control Manager
RAC Environmental Compliance Manager
RAC QA Manager
TAC Senior Program Manager
TAC Moab/Technical Group Field Manager
TAC, Health, Safety, and Training Manager
TAC QA and Environmental Compliance Manager
TAC Safety Coordinator

ESH&Q = Environmental, Safety, Health, and Quality

Note: The DOE Federal Cleanup Director also serves as the DOE Public Affairs Specialist for the Moab UMTRA Project

2.2.4 DOE Environmental, Safety, Health, and Quality Assurance Manager

The ESH&QA Manager assists the FCD with developing and sustaining a vital and mature ISMS that includes effective contractor assurance systems and ensures essential elements of the ISMS are in place, such as effective federal and contractor safety and health programs, effective and achievable performance goals, and the ability to accurately collect sufficient performance data for accurate analysis. The ESH&QA Manager ensures corrective measures are enacted, as needed. The ESH&QA Manager determines the applicability of HAZWOPER regulations to activities in contaminated areas.

The ESH&QA Manager ensures oversight of contractor safety programs through performance monitoring against established goals, daily oversight, scheduled and other periodic assessments and surveillances, and a formal ISMS annual review that incorporates EMS and QA requirements.

2.3 Contractor Personnel

2.3.1 RAC Project Manager

The RAC Project Manager has the responsibility and authority to direct all hazardous waste operations and overall contractor responsibility to implement the contract scope of work. The Project Manager issues the HASP with concurrence from the DOE ESH&QA Manager, the TAC Senior Program Manager, the RAC ESH&Q Manager, and the TAC HS&T Manager.

2.3.2 RAC ESH&Q Manager

The RAC ESH&Q Manager reports directly to the RAC Project Manager.

The ESH&Q Manager:

- Has the responsibility and authority to develop and implement this HASP and verify compliance.
- Develops, approves, implements, and maintains Project H&S, Radiation Protection, ISMS, Environmental Management, and QA plans, programs, and procedures.
- Prepares ESH&Q status reports.
- Coordinates on-site ESH&Q training with TAC; ensures personnel training requirements are met.
- Serves as the focal point for communication with DOE, TAC, and subcontractors on ESH&Q issues.
- Staffs, evaluates, and commits ESH&Q resources.
- Conducts audits and oversees corrective action implementation.

2.3.3 RAC Moab Operations/Site Manager

The RAC Moab Operations/Site Manager is responsible for work performed at the Moab site, off-site operations, vicinity properties, and for providing the resources necessary to perform the work. Specific responsibilities include Project scheduling, cost updating, and overall site operations.

2.3.4 RAC Crescent Junction Operations/Site Manager

The RAC Crescent Junction Operations/Site Manager is responsible for site operations as related to mill tailings placement work, construction performed at the Crescent Junction site, and for providing the resources necessary to perform the work. Specific responsibilities include Project scheduling, cost updating, and overall site operations.

2.3.5 RAC H&S Manager

The H&S Manager serves the RAC management team by assisting with H&S policy development based on evaluation of DOE, OSHA, and other regulatory requirements. The H&S Manager is responsible for ensuring the RAC Project Manager has the necessary H&S support to effectively implement the HASP.

The H&S Manager determines the applicability of HAZWOPER regulations to activities in contaminated areas.

2.3.6 RAC Radiological Control Manager

The Radiological Control Manager is responsible for implementation of the Radiological Protection Program in accordance with 10 CFR 835, "Occupational Radiation Protection." This includes supervising dosimetry and surveying activities and providing the release of materials and equipment from radiological areas.

2.3.7 RAC Environmental Compliance Manager

The RAC Environmental Compliance Manager provides information on the regulatory notification requirements to the appropriate Project management in the event of a spill or a release of regulated materials and recommends follow-up actions to remain in compliance with applicable regulations. This position is responsible for identification and disposition of regulated materials.

2.3.8 RAC QA Manager

The RAC QA Manager is responsible for implementation of the Quality Assurance Program. The QA Manager serves as the RAC's subject matter expert on QA matters to ensure work planning, design implementation, and procurement follow procedural requirements, and performs reviews, audits, surveillances, and assessments on operational activities.

2.3.9 TAC Senior Program Manager

The TAC Senior Program Manager serves as the Scope of Work Manager to ensure TAC tasks are implemented, reported, and satisfactorily completed in accordance with the contract and the requirements of the TAC's Project Management Control System description. The Senior Program Manager is also responsible for DOE and regulatory interfaces, staff assignments, status reporting, planning documents, program reviews, and general program oversight.

2.3.10 TAC Technical Management Group/Field Manager

The TAC Technical/Field Manager is responsible for ground water remedial action, air monitoring, revegetation, and overall TAC field and technical activities. The Manager is the TAC point-of-contact for the RAC when off-hour issues arise that are under TAC control or that affect TAC activities.

2.3.11 TAC Health, Safety and Training Manager

The Health, Safety and Training manager provides programmatic health, safety and training support for the Project in accordance with DOE Orders and federal regulations. The HS&T Manager is responsible for the overall health and safety of TAC personnel and also conducts field operations oversight and assessments of RAC and associated contractors to verify compliance and implementation of Project requirements.

2.3.12 TAC QA and Environmental Compliance Manager

The QA and Environmental Compliance Manager provides, implements, and maintains QA and Environmental Compliance Programs and a Contractor Assurance System for the Project in accordance with DOE orders and federal regulations and is responsible for continuously pursuing enhancements to quality, safety, and reliability. The manager also provides programmatic and operational emergency management support to DOE and helps implement their oversight plan.

2.3.13 TAC Safety Specialist

The TAC Safety Specialist performs safety activities at all three job locations:

- Develops or assists in the development of site safety programs and enforces safety standards.
- Conducts safety training; conducts safety inspections, rectifies deficiencies and reports results.
- Advises the DOE on the status and adequacy of the RAC, TAC, and DOE safety programs and on safety matters to support mission accomplishment.
- Conducts accident investigations.
- Completes required reports including OSHA Form 300.
- Performs reporting of daily activities.
- Hands on involvement with subcontractors and self-performance tasks.
- Maintains applicable safety reference materials.
- Provides technical assistance to contractors and other personnel in interpreting and complying with safety codes and standards.

2.3.14 Site Worker Safety Responsibility

Site workers are responsible for their own safety in addition to the safety of those around them. Site workers shall use equipment provided in a safe and responsible manner as directed by their supervisors. Site workers shall follow the practices set forth in this HASP.

The keys to working safely and in compliance with 10 CFR 85, “Worker Health and Safety Program,” are:

- **Understand the work.** Understand what is to be done, in what order, and what the end result should be.
- **Understand the hazards.** Understand what the hazards of the tasks are and the hazards posed by concurrent tasks.
- **Understand the hazard controls.** Understand how the hazards are to be eliminated or controlled while the work is being performed.
- **Work within the hazard controls.** While performing work, rigorously adhere to the hazard controls. Do not cut corners or skimp on safety to get a job done faster.
- **Recommend ways to improve the process.** Site workers shall provide feedback when asked and volunteer feedback when not asked.
- **Be alert to changing conditions.** By understanding the work, the hazards, and the controls, site workers can determine if the plans match realities in the field. Site workers will know if an unanticipated hazard is encountered, if work is not happening according to plan, or if the plan will not work.

2.3.15 Site Worker Stop Work Procedure

Site workers have the authority and responsibility to stop dangerous work in accordance with the *Moab UMTRA Project Stop Work Procedure* (DOE-EM/GJ1548).

The essence of the *Stop Work Procedure* is as follows.

1. **Stop** yourself and/or coworker if you see a dangerous situation.
2. **Protect** yourself and others and make the condition safe, if possible.
3. **Immediately** notify supervisor and/or H&S.
4. **Wait** for direction from a supervisor.

3.0 Emergency Response Status and Capabilities

This section outlines the emergency medical, rescue, and hazardous materials response and staffing, apparatus, facilities, equipment, training, mutual aids, pre-incident plans, and procedures discussed in further detail in the *Emergency/Incident Response Plan*.

3.1 Emergency Response Plans and Procedures

Pre-incident plans include the *Emergency/Incident Response Plan*, the *Moab UMTRA Project FY2016 Emergency Readiness Assurance Plan* (DOE-EM/GJ2275), and Grand County's Emergency Response Plan and Mass Casualty Incident Plan.

Additionally, the Project's IWP/JSA documents provide information on work controls and preventive measures to prevent or decrease the likelihood or potential severity of incidents and bounding conditions to ensure personnel safety or health, protection of the environment, and/or protection of property.

Project procedures and plans specific to fire, emergency medical, rescue, and hazardous materials responses are listed below.

All documents are available on the Project's SharePoint website.

- *FY2018 Emergency Readiness Assurance Plan*
- *Emergency/Incident Response Plan*
- *Emergency Contact List* (DOE-EM/GJ1757).
- *Moab UMTRA Project Occurrence Reporting Procedure* (DOE-EM/GJ2135)
- *Moab UMTRA Project Incident Reporting Procedure* (DOE-EM/GJ2136)

Fire

- *Moab UMTRA Project Fire Safety Procedure* (DOE-EM/GJ1555)
- *Moab UMTRA Project Pressure Safety – Compressed Gas Cylinders Procedure* (DOE-EM/GJ1573)
- *Moab UMTRA Project Control of Hot Work Procedure* (DOE-EM/GJ1953)
- *Moab UMTRA Project Open Burning Procedure* (DOE-EM/GJ2086)
- *Moab UMTRA Project Wildland Fire Management Plan* (DOE-EM/GJ2150)

Emergency Medical

- *Moab UMTRA Project Bloodborne Pathogens Program/Exposure Control Plan* (DOE-EM/GJ1621)
- *Emergency Medical Response Program*

Rescue

- *Moab UMTRA Project Confined Space Entry Procedure* (DOE-EM/GJ1553)
- *Moab UMTRA Project Excavation and Trenching Procedure* (DOE-EM/GJ1609)
- *Moab UMTRA Project Fall Protection Procedure* (DOE-EM/GJ1610)
- *Moab UMTRA Project Tailings Pile Management Plan* (DOE-EM/GJRAC1891)

Hazardous Materials

- *Moab UMTRA Project Spill Prevention Control and Countermeasure Plan* (DOE-EM/GJRAC1477)
- *Moab UMTRA Project Hazard Communication Program* (DOE-EM/GJ1605)
- *Moab UMTRA Project Waste Management Plan* (DOE-EM/GJ1633)
- *Moab UMTRA Project Health and Safety Suspected Hazardous Residual Radioactive Material Response Procedure* (DOE-EM/GJRAC2160)

3.2 Emergency Medical and Rescue

The Project makes First Aid, CPR/AED training available to all employees. The RAC Operations Managers are responsible for ensuring at least two CPR First Aid trained personnel are on site during hours of routine RAC operations and determining the necessary requirements for non-routine and off-hours work on a case-by-case basis with input from the Health and Safety Manager. The *Emergency Medical Response Program* outlines the roles and responsibilities of key personnel in the event of a medical emergency and applies to Project employees who are trained in First Aid, CPR/AED and other key personnel on the Project as they perform their duties when responding to medical emergencies on the Project.

Additionally, the Project has in place memoranda of understanding (MOUs) with the Emergency Medical Services of both Grand and Emery counties in Utah. MOUs have been established with the emergency response organizations (EROs) listed in Table 2. Additional emergency response coordination includes St. Mary's Hospital CareFlight helicopter service out of Grand Junction and Classic Air Medical, an emergency response helicopter service based in Moab.

Although there have been no MOUs established with St. Mary's CareFlight or Classic Air Medical, the Project has provided these organizations with orientations of the sites to ensure processes are in place to facilitate air medical emergency response if needed.

Table 2: On-site/Off-site Agreements (EROs)

Agreement
Grand County, EMS
Moab Regional, Hospital
Emery County, EMS
Rocky Mountain, Power

EROs and their personnel are an integral part of the Project's EMS. The Project continues to strengthen relationships with local external EROs through training, outreach activities, multi-organizational drills, and the Local Emergency Planning Committee meeting attendance and participation.

To strengthen the relationship with the EROs, Radiological Control and H&S staff continues implementation of their plan to work with the different Grand County medical and rescue agencies to educate their staff on the hazards at the Project sites, primarily RRM, and coordinate emergency medical response. The Moab Valley Fire Protection District (MVFPD) would be the primary responder for events requiring rescue and for events requiring hazardous materials response. The MVFPD total response staff is approximately 30 personnel.

3.3 Accident Investigation

The Operations/Site Managers and other members of the Project shall be immediately notified of accidents, incidents, abnormal events, or near misses that may affect the health and safety of site workers, the general public, or the environment. Equipment and/or a work site involved in an accident/incident or abnormal event shall be secured until the RAC Operations/Site Manager or the TAC Technical Management Group/Field Manager or their designees have given permission to resume work.

Incidents requiring significance levels 1 and 2 Condition Reports must be screened for Price-Anderson Amendments Act (42 USC 2210) applicability and reportability as described in the *Moab UMTRA Project Price-Anderson Amendments Act Reporting Procedure* (DOE-EM/GJRAC1714).

4.0 H&S Hazard Analysis

4.1 General Requirements

Project sites and tasks have been evaluated to identify specific site hazards and to determine the appropriate safety and health control procedures needed to protect employees from the identified hazards. This section addresses the radiological, chemical, biological, health, and physical hazards for the Project. Site workers shall comply with the HASP.

Before site entry, preliminary evaluation of each Project site's characteristics shall be performed by a qualified person to help select appropriate employee protection methods. Immediately after initial site entry, a more detailed evaluation of the site's specific characteristics shall be performed by a qualified person to further identify existing site hazards and to further help with the selection of the appropriate engineering controls and personal protective equipment (PPE) for the tasks to be performed. These hazards and the appropriate controls/PPE will be documented in the applicable IWP/JSA and/or RWP. Hazards identified at the Project are discussed in the following subsections.

A hazard analysis for potential exposure to radiological hazards is presented in Section 4.3.1 of the *Moab UMTRA Project Hazardous Categorization* (DOE-EM/GJRAC1722). This analysis determined the Project is categorized as a radiological facility and that adequate safety is ensured by following the requirements of 10 CFR 851 and 10 CFR 835. This HASP implements these requirements.

The IWP/JSA is the work planning document to which Project work is performed. The IWP/JSA establishes the approved work steps, hazards, and hazard controls for performing a work activity. The IWP/JSA remains active for the duration of the task for which it was developed or until cancelled by the RAC Operations/Site Manager or TAC Technical Management Group/Field Manager. An IWP/JSA and RWP, if necessary, shall be developed and approved by the appropriate work group for each task or work activity. Copies of this HASP, IWPs/JSAs, RWPs, and other site-specific addenda shall be maintained on the Project's SharePoint website.

The RWP defines radiological conditions associated with work involving potential exposure to ionizing radiation; it includes controls, PPE, and radiological monitoring requirements for the work.

Subcontractors and vendors shall be informed of site hazards and trained in accordance with the *Moab UMTRA Project Subcontractor and Vendor Management Procedure* (DOE-EM/GJRAC1918) before performing any work on site.

4.2 Chemical and Hazardous Materials Communication Program

The purpose of the Hazard Communication (HazCom) Program is to ensure the requirements of 29 CFR 1910.1200, "Hazard Communication," 29 CFR 1926.59, "Hazard Communication," and the *Hazard Communication Program* are integrated into the performance of Project work.

The basic principles of this HazCom Program are to:

- Ensure employees are provided information about the chemical and hazardous materials to which they are or may be exposed.
- Ensure employees know what protective measures are available to control the hazards and prevent adverse effects.

NOTE: OSHA's fact sheet, "Hazard Communication Standard," was revised in 2012. Known as "HazCom 2012," the new standard is compliant with the Globally Harmonized System of Classification and Labeling of Chemicals. The Project complies with the requirements in accordance with HazCom 2012.

A written HazCom Program ensures the hazards of chemicals produced or imported by chemical manufacturers or importers are evaluated and that information concerning their hazards is transmitted to potentially affected employers and employees and contains the following information.

- Container-labeling personnel shall ensure drums and containers are labeled according to contents. These drums and containers shall include those from manufacturers and those produced on site by operations. Manufacturers' labels and warnings will serve as the primary labeling system for containers and will not normally be removed or covered with another label. Worn or damaged labels on manufacturers' containers shall be replaced with labels consistent with 29 CFR 1910.1200 regulations.

- Transfer containers (those without labels that are filled from the manufacturers' containers) that are kept for more than one shift or accessible to more than one person shall be considered a secondary container and labeled consistent with 29 CFR 1910.1200.
- A complete inventory or list of hazardous chemicals known to be present in the workplace that may expose an employee to a physical or health hazard will be included in each work area and readily available to affected employees.
- Safety Data Sheets (SDS) for each hazardous chemical used at Project facilities shall be maintained so that they are immediately accessible to employees during work shifts and are available through H&S.

Employee Information and Training

Each new Project employee shall be briefed by line supervision on the basic requirements of the HazCom Program, including:

- An overview of 29 CFR 1910.1200.
- Details of the *Hazard Communication Program*, including the location and availability of the written program, hazardous chemical lists, and SDS.
- Hazardous materials labeling and warning systems
- Explanation of the labeling system, the SDS, and how employees can obtain and use the appropriate hazard information.
- Physical and health hazards of chemicals in the work area.
- The right of employees to obtain information regarding hazardous substances that they may potentially be exposed to and their rights to authorize their physician or designated representatives to obtain that information.
- Specific procedures for safe use and handling.
- Measures employees can take to protect themselves from the physical and health hazards, such as appropriate work practices and the use of PPE.

Communication of hazard information shall be covered in written training programs and Project safety meetings or an IWP/JSA. The training shall include adequate information so that the affected workers can associate the identity on the label with the product in use.

As a best management practice, off-specification products (i.e., expired chemicals) and other waste streams shall be clearly labeled to define contents and in accordance with 42 USC 6901, the Resource Conservation and Recovery Act (RCRA) requirements.

The RAC H&S Manager (or designee) shall be notified before the purchase of new chemicals. When new chemicals are introduced or discovered on site, employees shall be given information on this material during routine work planning sessions, safety meetings, or immediately if necessary.

An electronic or paper copy of the chemical inventory list and SDS are maintained in the main Administration Support office for the Moab site, the H&S/Radiological Control office for the Crescent Junction site, and in the break room at the Grand Junction office. An electronic copy of the chemical inventory list and SDS can be found on the Project's SharePoint website.

4.3 Hazard Characterization and Controls

All suspected conditions that may pose inhalation or skin absorption hazards that are immediately dangerous to life or health (IDLH) or other conditions that may cause death or serious harm shall be identified during the initial hazard evaluation and, if necessary, should be further evaluated based on workplace monitoring.

Examples of such hazards include, but are not limited to: confined space entry, potentially explosive or flammable situations, visible vapor clouds, or areas where biological indicators such as dead animals or vegetation are located.

4.3.1 Ionizing Radiation

The focus of the Moab site remedial action is the conditioning and transport of RRM associated with the uranium mill tailings pile and vicinity properties. The focus of the Crescent Junction site disposal cell is placing and covering RRM. These materials contain several radioactive isotopes in the uranium decay series. Collectively, they emit alpha, beta, and gamma radiation.

Ionizing radiation hazards from uranium mill tailings result in low hazard to exposed workers. Three primary routes of exposure are inhalation of RRM, ingestion of RRM, and exposure to penetrating radiation.

The Project will use passive and active engineering controls within the operational and facility design and implement administrative controls, when practical, to ensure radiation exposures are maintained as low as reasonably achievable and that RRM is contained for effective personnel protection. Radiation exposure to the work force and the public is controlled so that radiation absorbed doses are maintained well below regulatory limits and that there is no radiation exposure without commensurate benefit.

Each individual performing work for the Project around or with RRM is expected to demonstrate responsibility and accountability through an informed, disciplined, and cautious attitude toward RRM.

No RAC/TAC employee, DOE employee, subcontractor, or visitor shall take or cause to be taken actions inconsistent with the requirements of the *Moab UMTRA Project Radiation Protection Program* (DOE-EM/GJ610) or Project programs, plans, schedules, or other processes established by 10 CFR 835.

The potential exists for radiation exposure from radon daughters, and this exposure is considered occupational. The personal exposure monitoring threshold is 500 millirems per year. Personnel dosimetry requirements are determined by the Radiological Control Manager (RCM).

In the Contamination Area (CA), personnel, equipment, and items may come into contact with soils and other items contaminated with uranium mill tailings and ore from uranium milling operations that may result in the transfer of residual radioactive contamination; however, controls are required and implemented to minimize the spread of contamination

4.3.2 Noise

The American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV) for noise exposure shall be followed. Where noise levels exceed a level of 85 decibels (dBA) on an 8-hour time-weighted average (TWA) or 140 decibels relative to carrier impact noise level, hearing protection shall be made available to and used by exposed employees. Sound level surveys and employee exposure monitoring shall be conducted by the contractor on the site if employee noise exposures are suspected of exceeding the action level (AL).

Exposure assessments shall be conducted for personnel whose exposure may exceed the ACGIH TLV (85 dBA). Site workers shall not be exposed above the TLV without hearing conservation program enrollment and the use of properly attenuated personal hearing protection.

The action and exposure assessment criteria levels shall be adjusted according to the applicable ACGIH TLV for shifts longer than 8 hours. Issues related to occupational noise are covered in the *Moab UMTRA Project Hearing Protection and Conservation Procedure* (DOE-EM/GJ1617).

4.3.3 Chemical Hazards

Various chemical hazards are associated with Project activities as identified in the *Moab UMTRA Project Hazards Survey* (DOE-EM/GJ2055). Exposure monitoring is performed consistent with the Project Industrial Hygiene Program. RAC exposure monitoring is performed in compliance with the *Moab UMTRA Project Industrial Hygiene Sampling and Analysis Plan* (DOE-EM/GJRAC2143), *Moab UMTRA Project Baseline Exposure Assessment Sampling and Analysis Plan* (DOE-EM/GJRAC2192), and the *Moab UMTRA Project Industrial Hygiene Real-time Monitoring Procedure* (DOE-EM/GJRAC2126).

The RAC exposure monitoring results of the sampling efforts are discussed in the *Moab UMTRA Project Industrial Hygiene Baseline Health Risk Assessment Report* (DOE-EM/GJRAC2157). TAC chemical hazards are evaluated in qualitative assessment and then for potential exposure quantitative assessment, which is performed by a subcontractor using their sampling procedures.

The hazard evaluations included in these sampling plans indicate potential exposure to dust, silica, metals (specifically manganese and lead), and various chemicals that exist on the Project, based on the location and type of tasks being performed. All exposure monitoring shall be performed in accordance with recognized exposure assessment and testing methodologies and using accredited laboratories.

Various types of asbestos-containing material (ACM) may also be encountered at any of the Project sites; currently, ACM is known to exist in the Atlas Building and in the autoclaves. All ACM shall be managed in accordance with 29 CFR 1910.1001, "Asbestos," and 29 CFR 1926.1101, "Asbestos." If asbestos is suspected, work shall be suspended, and the H&S Manager or appropriate member of the H&S staff at the Project shall be contacted to perform an inspection and coordinate sampling, if necessary.

All known ACM shall be conspicuously marked, and site workers shall be briefed if they are going to work in the vicinity of ACM. Additional training requirements shall be implemented in the event of required sampling, abatement, or waste packaging activities.

The potential to encounter unknown hazardous wastes exists during tailings pile excavation. Access to the tailings pond was not well controlled before DOE assumed responsibility for the site, so there is not a full chemical inventory of hazardous wastes that may exist in the pile.

Internal combustion engines, particularly gasoline-powered engines, produce carbon monoxide, which could produce hazardous concentrates. Any operation of such equipment inside areas of poor ventilation (e.g., interior of buildings, trenches) requires adequate ventilation to ensure a safe environment. Such operations shall be addressed on the applicable IWP/JSA and brought to the attention of H&S. Air monitoring and respiratory protection may be required.

Silica quartz is present in significant levels in concrete blocks, in mill tailings, and at lower concentrations in soil. Silica poses a hazard during such tasks as: cutting and jack hammering concrete; well or core drilling; moving, blading, or compacting mill tailings; and backfilling with clean soil. Sandstone composition in this region ranges from 30 to 60 percent silica quartz.

With a high percentage of silica quartz in the surrounding environment and when blowing dust clouds are readily visible, silica monitoring on similar past projects has shown silica quartz in the air to be about half of the ACGIH TLV (0.025 milligrams per cubic meter respirable fraction). Work activities that generate silica-containing dust shall require dust suppression, such as watering. If such suppression techniques are not feasible, air monitoring and respiratory protection may be required.

Various types of waste containing hazardous components may be generated at all sites. All waste shall be managed in accordance with the *Waste Management Plan*. Waste storage locations shall be clearly established, waste containers shall be properly labeled, and routine inspections shall be performed and documented. Personnel who handle waste shall receive applicable training.

4.3.4 Biological

The following biological hazards could be encountered. Should they should occur, personnel shall notify their supervisors immediately.

Animal bites, spider bites, and insect stings can cause localized swelling, itching, and minor pain that can be handled by first-aid treatment.

The Project sites are inhabited by black widow spiders, brown recluse spiders, and various bees, wasps, and scorpions that can cause serious injuries or toxic reactions, necessitating immediate evacuation to the nearest hospital. In sensitized individuals, bites or stings from less toxic insects can result in serious allergic reactions that also require immediate medical attention.

While sensitivity to insect bites is a medical condition and, therefore, protected information, sensitized individuals may wish to consider notifying their supervisors and or members of the Project's Emergency Medical Response Team of their condition to facilitate and expedite medical assistance in the event of an allergic reaction. No attempts should be made to capture wild or semi-wild animals, such as cats or rats, because of the possibility of a bite or parasitic infestation.

Poisonous snakes are rarely encountered, although several species of small rattlesnakes are known to inhabit the area. To care for someone bitten by a venomous snake, the wound should be immediately washed, immobilized, and kept lower than the heart, if possible. Immediate medical attention shall be sought. A bite by a non-venomous snake should be treated as a first-aid case using routine procedures. If unsure whether the bite was from a venomous or non-venomous snake, treat it as a bite from a venomous snake.

Animal and bird droppings often contain mold, fungus, or bacteria that represent a significant respiratory hazard. Personnel should not touch droppings and must wear gloves and impervious coveralls when going into limited access areas, such as crawl spaces and high ceilings that have become refuges or nesting areas.

Hantavirus exposure can occur in areas where there are concentrations of droppings from mice or other rodents. The virus can be inhaled in the dust from these areas where rodents have nested or left their droppings. Minimizing dust inhalation or avoiding these areas will decrease the risk of exposure. Contact H&S if an area showing signs of infestation. Additional information on safe cleanup procedures for rodent nests, wastes, and dead rodents can be found at <http://www.cdc.gov/rodents/cleaning/>.

Sewer system breaks or leaks shall be immediately reported to the Operations/Site and the H&S Managers, and the area shall be evacuated until an appropriate plan of action is made. Anyone who comes in contact with sewer waste shall immediately wash their hands and other affected areas with soap and warm water.

4.3.5 Physical

The following physical hazards could be encountered.

Head, Eye, Ear, Hand, and Foot Hazards

Employees working in designated hard-hat areas such as the Moab support areas or controlled area or other areas where there is possible danger of head injuries from impact, falling, flying, or low overhead objects, electrical shocks, or bumps are required to wear protective hard hats. Eye and face protection, as appropriate, shall be worn in designated areas and when machines or operations present the hazard of flying objects, glare, radiant energy, liquids, chemicals, or a combination of these hazards.

Employees working in operations with potential for hand injury shall wear appropriately selected hand protection based on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use, and the hazards and potential hazards, including chemical exposure hazards, identified.

Employees working in areas where there is a possible danger of foot injury from compression (crushing) impact from falling or flying objects, penetration, or electrical shock shall be required to wear safety footwear appropriately rated for each potential hazard(s).

Material Handling

Good ergonomic practices, such as keeping the spine straight, lifting with the legs, and keeping objects as close to the body as possible, shall be used when handling heavy or bulky objects. Mechanical equipment shall be used when possible. An individual should not lift an object weighing more than 50 pounds or 33 percent of the individual's body weight, whichever is less, without assistance (e.g., additional personnel, approved and inspected mechanical equipment).

Hoisting and Rigging Operations

Hoisting and rigging operations shall comply with and be executed in accordance with the *Moab UMTRA Project Hoisting and Rigging Procedure* (DOE-EM/GJ1613).

Requirements for hoisting and rigging operations must be defined clearly, and the work must be planned properly because the consequences of a hoisting and rigging incident may involve death, serious injury, and/or significant property damage.

Operators, riggers, and other involved personnel must have adequate training and maintain necessary certifications, must plan and work together as a team, and must execute applicable plans with attention to detail. The use of reliable equipment designed and sized for the task, regularly inspected, and appropriately maintained is essential to a safe lift.

It is imperative to have a plan for every lift, standard or non-standard, whether it is a documented standard lift plan (see Form HS-F-009), a documented non-standard lift plan (Form HS-F-010), or a plan documented in existing procedures or IWPs/JSAs for a recurring standard or non-standard lift. In these cases, the successful outcome of a lift depends on a systematic, planned operation. All forms are available on the Project's SharePoint website.

Hot Work: Open Flame, Welding, or Other Significant Spark-producing Operations

Hot work is activity using equipment that produces flames, sparks, or heat that is sufficient to start a fire or ignite flammable/combustible materials. Hot work should be performed in a designated safe area (i.e., an area designed and designated for the performance of work involving an open flame, welding, or other significant spark-producing operations such that hazards associated with fires and explosions are eliminated and employee exposure to fumes, arc flash, and open flame is controlled). When hot work is performed, the *Fire Safety Procedure* and the *Control of Hot Work Procedure*, as applicable, will be followed.

Flammable Liquids and Refueling

Storage of flammable liquids and refueling operations shall be in accordance with 29 CFR 1926.150, "Fire Protection and Prevention," through 29 CFR 1926.152, "Flammable and combustible liquids."

HazCom signs that meet the requirements of 29 CFR 1926.150 through 152, Subpart G, "Signs, Signals, and Barricades," shall be posted at refueling and flammable liquid storage areas.

No smoking, open flames, or spark- or flame-producing work shall occur within 50 feet of flammable liquid storage locations or refueling operations. Fire extinguishers shall be provided and placed in accordance with 29 CFR 1926.150 through 152 and shall be the pressurized dry chemical type with a minimum Underwriters Laboratories rating of 2A:10ABC.

Refueling is conducted according to *Moab UMTRA Project Delivery and Dispensing of Petroleum Products Procedure* (DOE-EM/GJRAC2066).

Electrical Hazards

Electrical work shall be performed in accordance with National Fire Prevention Association (NFPA) Standard 70 E, “Standard for Electrical Safety in the Workplace,” *Moab UMTRA Project Electrical Safety Procedure* (DOE-EM/GJ1551), and OSHA requirements. Developed electrical safety training shall be classroom, on-the-job, or a combination of the two. The degree of training provided shall be determined by analysis of the potential risk to the employee.

Underground utilities must be properly located before making ground penetration or soil disturbance of 6 inches or more depth, and marked offsets must be established. Work involving heavy equipment underneath or in close proximity to overhead power lines shall be addressed in an IWP/JSA. The IWP/JSA shall clearly identify appropriate controls such as barricades or use of spotters.

A minimum of 20 feet between working equipment and unevaluated energized overhead power lines shall be consistently maintained. Once a proper evaluation to determine safe distances has been performed, the minimum clearance distances dictated by 29 CFR 1926.1408, “Power line safety (up to 350 kilovolts) equipment operations,” Table A, “Minimum Clearance Distances,” shall be observed.

Electrical devices and equipment must be de-energized before working on them. The *Moab UMTRA Project Lockout/Tagout Procedure* (DOE-EM/GJ1552) or the *Moab UMTRA Project Motorized Equipment Inspection and Maintenance Program* (DOE-EM/GJ1726), as applicable, shall be followed:

- To prevent electrical equipment ground fault incidents, portable equipment, temporary installations, extension cords, and ground fault circuit interrupters (GFCIs) must be kept out of water, protected from crushing.
- Temporary electrical circuits and cord-and-plug electrical tools must be used with a GFCI. Defective electrical equipment (e.g., cords, plugs, tools) shall be tagged and removed from service.
- Before new work starts, the contractor shall determine, by inquiry, direct observation, or with instruments, whether the location of the parts of an energized electric power circuit exposed or concealed during the performance of the work may bring a person, tool, or machine into physical contact with an energized electric power circuit. Where such a circuit exists, warning signs shall be posted.
- These warning signs should be of a standard design so the meaning of them is clearly understood. Where such a circuit exists, employees shall be advised of the location of the lines, the specific hazards involved, and the protective measures to be taken. Depending on the nature of the system and the work being performed, lockout/tagout procedures may be necessary.

Slip/Trip/Fall Hazards

The work area shall be kept clean and orderly. Tools and debris must be picked up and placed in the proper place to prevent tripping hazards. Spills shall be immediately cleaned up. Caution must be exercised when using steps and stairs with slippery surfaces.

Good housekeeping practices are essential to minimize trip hazards. The three-points-of-contact rule shall be used while climbing, accessing, and egressing equipment.

If elevated work should be required, it shall be accomplished in accordance with 29 CFR 1926, Subpart M, “Fall Protection,” and the *Fall Prevention and Protection Procedure*.

Underground Utilities

Underground utilities, including electrical power, high-pressure gas, telecommunications, water, and sewer may be present at Project sites and are maintained by the applicable utility company.

Work in the vicinity of the marked gas lines shall be coordinated with the Operations/Site Manager, the H&S Manager, and utility company representatives. Mechanical excavation shall not be performed within 10 feet of underground gas lines or other public utility locations or within utility rights-of-way without approval from the utility owner.

Excavations

For Project areas or activities that fall outside of active RRM management, soil disturbances or penetrations of a depth of 6 inches or more shall require the implementation of the *Excavation and Trenching Procedure*, including an Excavation Permit (Form 1073). Site excavations created during site preparation or during hazardous waste operations shall be shored or sloped as appropriate to prevent accidental collapse in accordance with 29 CFR 1926, Subpart P, “Excavations.”

If personnel will be required to enter the excavation, a competent person for excavations shall complete an Excavation Inspection Form (Form 1074) before approving personnel entry. Personnel entering excavations 5 feet or greater in depth shall be protected in accordance with the requirements of 29 CFR 1926 Subpart P and the *Excavation and Trenching Procedure*.

A competent person for excavations shall determine the soil type being excavated and shall perform inspections of each excavation, adjacent areas, and protective systems (when applicable) daily and under additional conditions specified by the procedure. The inspections shall be documented.

Underground utilities shall be located, marked, and de-energized, when possible, before commencing an excavation. Excavations within 18 inches of a known energy source or other utility shall be hand-excavated, carefully uncovered, protected, supported, or removed, as necessary to safeguard employees.

Ramps or ladders shall be provided in excavations 4 feet or more in depth and placed no more than 25 feet from personnel in the excavation. Excavated materials (i.e., spoils) must be kept at least 2 feet from the edge of the excavation.

Hand and Power Tools

Hand and power tools shall comply with 29 CFR 1926, “Tools – Hand and Power,” and the *Moab UMTRA Project Power and Hand Tools Procedure* (DOE-EM/GJ1611). In general, the tools shall be in good repair, shall be used only for the job they are designed to do, shall have required guards and other safety devices in place in accordance with manufacturer recommendations, and should be kept clean.

Damaged tools shall be tagged out and removed from service. Repairs are to be made in accordance with the manufacturers' requirements.

When performing work from an elevated location, tools shall be placed in a holding receptacle or secured when not in use. Tools shall not be thrown or dropped from heights. Only non-sparking tools shall be used in flammable or explosive atmospheres. Electrical tools shall not be carried or lowered by their electrical cords.

Ladders

Portable ladders shall be used in accordance with the *Ladder Inspection and Use Procedure*. Employees who are required to use ladders as part of their employment shall be trained in accordance with 29 CFR 1926.1060, "Training requirements."

Working Over or Near Water

When employees are working over or near water (within 6 feet) where a danger of drowning exists, U.S. Coast Guard-approved life jackets or buoyant work vests shall be worn, and a buddy with a floatation device (ring buoy) will be present during these activities.

When the potential of falling into a body of water exists (i.e., personnel close to the shoreline), life vests shall be worn, and ring buoys shall be placed at active work locations with a buddy present. One life-saving skiff shall be immediately available at the location or adjacent to the water, if appropriate, and lifelines and body harnesses shall be provided as needed.

Working On or Near Active Rail Lines

Active rail lines are present at both Moab and Crescent Junction sites. At Moab, no activities shall be performed on or near rail lines without UPRR track protection established by the Transportation Manager. Once track protection is established, the "Men Working" blue flags must be placed before any activity and removed immediately afterward. Activities on or near the UPRR main line tracks without this protection are considered trespassing.

At Crescent Junction, activities on or near the siding tracks may be conducted after the "Men Working" blue flag sign is placed 18 inches east of the UPRR AB Switch Point. No activities may be conducted west of the blue flag. Due to the proximity to the main line tracks, activities west of this point are considered trespassing by UPRR. The following items shall be considered during activities on or near rail line.

- Never step on the train track rails.
- Keep body parts and clothing away from all railcar pinch points.
- There is always stored energy associated with railcars; they can move several feet without notice.
- Crossing railcars is allowed at the flat car articulated hinge or the safety crossing, never at the knuckle. Never cross under a railcar.

Working in Areas with Public Access

Extreme caution shall be used when working in areas where the public has uncontrolled access to personnel, equipment, and work areas. Caution should be used in activities that may involve interaction with the public, such as driving on public roadways, moving equipment, performing maintenance, or other activities that may lead to contact with the public. In addition, since members of the public may not be trained in hazard recognition, work areas must be controlled and public access restricted when hazardous work is performed.

4.3.6 Confined Space Entry

Confined spaces shall be evaluated and controlled in accordance with the *Confined Space Entry Procedure*.

4.3.7 Heat Stress

Personnel could potentially be exposed to heat stress conditions when working on the Project. The Project will monitor for heat stress if ambient temperatures are expected to exceed 80°F at the respective work locations in accordance with the *Heat Stress Procedure*. This procedure allows use of either biometric monitoring or work/rest regime.

The potential for heat stress is a concern because of factors such as high air temperature, high relative humidity, low air movement, high radiant heat, protective clothing, and the level of physical activity of workers.

The potential exists for:

- Heat rash from continuous exposure to heat or humid air, resulting in a reddish skin rash, usually in areas where clothing is restrictive, and the skin stays wet from perspiration.
- Heat cramps caused by heavy perspiration and inadequate replacement of electrolytes. Signs and symptoms include:
 - Muscle spasms.
 - Pain in the hands, feet, and abdomen.
- Heat exhaustion from increased stress on various body organs, including inadequate blood circulation because of cardiovascular insufficiency or dehydration. Signs and symptoms include:
 - Pale, cool, moist skin.
 - Heavy perspiring.
 - Dizziness.
 - Nausea.
 - Fainting.
- Heat stroke. When heat stroke occurs, temperature regulation fails, and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be immediately obtained. Signs and symptoms include:
 - Red, hot, and unusually dry skin.
 - Lack of or reduced perspiration.

4.3.8 Cold Stress

In cold surroundings, shivering increases the metabolic heat production, but the feet, face, and hands can still feel cold. This is often a confusing situation because the individual can be warmly clothed, in which case portions of the body become overheated while the extremities remain cold. The regulation of blood flow and sweating cannot uniformly keep every part of the body in thermal balance. Clothing must be appropriate to obtain uniform thermal balance. Controls for cold stress are outlined in the *Moab UMTRA Project Cold Stress Procedure* (DOE-EM/GJ2180).

4.3.9 Wind

The Project sites are in areas susceptible to high winds. When sustained wind speeds begin to affect equipment operation such as cranes and powered industrial equipment, work manageability or dust becomes difficult to control, workers should contact the H&S Manager or Operations/Site Manager to determine if site activities should cease until the wind speed decreases. Dust suppression procedures shall be consistently implemented.

Hoisting and rigging operations shall be evaluated (e.g., necessary control of load swing, rocking, rotation) by H&S. The evaluation shall consider the type of load relative to the wind conditions.

Reduced visibility conditions shall be evaluated by H&S to determine if it is unsafe for heavy equipment and vehicle traffic. When necessary, traffic should be halted until visibility adequately improves.

For high wind events (i.e., sustained winds or gusts >50 mph), the tent-style shop building and shade structures shall not remain occupied. This includes the Queue Shop and the Crescent Junction Shop, which were both manufactured by Cover-All Building Systems, Inc. Manufacturer recommendations for snow loads shall be followed.

4.3.10 Lightning

When lightning is visible, thunder is audible, and a storm appears to be within approximately 3 miles, H&S will direct Project site workers to leave high points (e.g. roofs, ladders). Operators in tracked equipment will be picked up by an enclosed vehicle with rubber tires (e.g., crew van). Personnel in exposed areas (e.g., open areas, top of a cell) shall go inside a properly grounded building or an enclosed vehicle with rubber tires.

When a lightning shutdown is ordered, it will remain in effect for 20 minutes after the last strike within the 3-mile limit; at that time, H&S will lift the lightning shutdown and allow work activities to resume. Employees will refrain from moving from one building to another while a shutdown is in effect unless they are authorized to move elsewhere by H&S or in emergency situations.

If an approaching storm exhibiting electrical activity is likely to affect the site, a lightning shutdown may be put into effect before detection of lightning within 3 miles. H&S will monitor weather radar and may activate the lightning detector when adverse weather and lightning is present.

4.3.11 Hillside Slippage on Moab Rail Bench

Rockslides have occurred on the rail bench and continue to be a threat to personnel and equipment located in these areas. Preventive measures are being taken to protect the workers from this hazard. The hillside is monitored for movement by radar and, in some cases, rock watch/spotter personnel; a visual inspection of the area is performed during hillside operation.

The hillside is also monitored after major rain events in winter months during the freeze/thaw cycles and after other activities or events that may affect the stability of the hillside. Both the RAC and TAC are responsible for evaluating the radar data and status of the radar system to determine if there are any causes for concern that would affect operations on the rail bench. On days where work is planned on the rail bench, a Radar Team member will perform an initial system and data evaluation before the morning tailgate meeting and will send out a Morning Radar Monitoring Report Form (OP-F-085) identifying the status of the hillside and any notable observations.

If hillside slippage is noticed before work begins, the area will be evaluated to determine if it is safe to work. When a slippage occurs during work activities, work in the area will be stopped, personnel in the area will take shelter in a safe location, accountability of workers in the area will be taken, and notification made to supervision. The area will be evaluated to determine if it is safe to resume work and what corrective actions are needed beforehand.

4.3.12 Motor Vehicles and Heavy Equipment Operation

Equipment must comply with the manufacturer’s specifications, OSHA requirements, and/or the *Moab UMTRA Project Motor Vehicle Procedure* (DOE-EM/GJ1554). Equipment shall be inspected before initial use on the Project. This inspection shall be performed or observed by appropriate and competent contractor personnel (e.g., H&S Manager, designee). Daily vehicle/equipment checks shall be performed and documented as appropriate.

A copy of the most recent vehicle/equipment inspections shall be maintained on the site. Vehicles/equipment with defects that render the equipment unsafe to operate shall be effectively tagged out and removed from service until the defects are corrected. Equipment shall be operated by qualified personnel in accordance with manufacturers’ guidelines and OSHA standards. Equipment operator qualifications shall be documented.

4.3.13 Cell Phones

Cell phones shall not be used by the driver of a vehicle or by the operator of equipment while in motion. If a cell phone must be used, the driver/operator will move to a safe area and stop before using the phone. Cell phone usage is described in the *Motor Vehicle Procedure*, company policies, and state traffic laws. Cell phone usage includes voice, texting, and emailing activities.

4.3.14 Illumination

Areas accessible to employees shall be lighted to not less than the minimum illumination intensities listed in Table 3 while any work is in progress.

4.3.15 Subcontractors and Vendors

Subcontractors and vendors accessing Project sites shall comply with applicable H&S requirements and shall complete applicable briefings and training as described in the *Subcontract and Vendor Management Procedure*. Unusual/high-risk vendor deliveries or subcontractor activities shall be evaluated by H&S and the vendor/subcontractor point-of-contact before delivery or commencement of work.

Table 3: Minimum Illumination Intensities in Foot-candles

Foot-candles	Area or Operations
5	General site areas.
3	Excavation and waste areas, access ways, active storage areas, loading platforms, refueling, and field maintenance areas.
5	Indoors: warehouses, corridors, hallways, and exit ways.
10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, indoor toilets, workrooms).
30	First-aid stations, infirmaries, and offices.

4.4 Risk Identification

Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these hazards shall be identified. Employees working on the site shall be informed of any risks that have been identified. In situations covered by the *Hazard Communication Program*, training required by that program need not be duplicated.

Risks to consider include, but are not limited to:

- Exposures exceeding the more conservative of the OSHA permissible exposure limits (PELs) or ACGIH TLVs.
- IDLH concentrations.
- Potential skin absorption and irritation sources.
- Potential eye irritation sources.
- Explosion sensitivity and flammability ranges.
- Oxygen deficiency.

5.0 Hierarchy of Controls

The hazards identified in Section 4.3 indicate the potential for exposure to a variety of hazardous substances, physical hazards, and health hazards. Controls to mitigate those hazards are presented in this section.

Methods to control hazards are divided into three major categories.

1. Elimination/substitution/engineering controls. Elimination is the priority in removing hazards. If elimination is not possible, substitution (e.g., less hazardous equipment, chemical, condition) shall be considered. If hazards cannot be controlled by elimination or substitution, mitigate with engineering controls.
2. Administrative controls and work practices.
3. PPE – use only when elimination/substitution or engineering/administrative control of hazards is not feasible or adequate.

NOTE: For fall protection and prevention, PPE is ranked second, above administrative controls and work practices.

For substances regulated in 29 CFR 1910, Subpart Z, “Toxic and Hazardous Substances,” engineering controls, work practices, PPE, or a combination of these shall be implemented to protect employees from exposure to hazardous substances and safety and health hazards.

For substances regulated in 29 CFR 1910, Subpart G, “Occupational Health and Environmental Control” (e.g., ventilation, noise, nonionizing radiation) and 29 CFR 1910 Subpart Z engineering controls and work practices shall be instituted to reduce and maintain employee exposure to or below the PELs for regulated substances to the extent required by 29 CFR 1910 Subpart Z, except to the extent that such controls and practices are not feasible. Engineering controls that may be feasible include the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material handling equipment.

Work practices that may be feasible are removing all non-essential employees from potential exposure during opening of drums, wetting down dusty operations, and locating employees upwind of possible hazards. Whenever engineering controls and work practices are not feasible or required, any reasonable combination of engineering controls, work practices and PPE shall be used to reduce and maintain to or below the PELs or dose limits for substances regulated by 29 CFR 1910, Subpart Z.

For substances not regulated in 29 CFR 1910, Subparts G and Z, the Project, with input from the RAC H&S Manager, and/or TAC HS&T Manager, and/or Industrial Hygienist, as applicable, may use the published literature and SDS as a guide to determine what level of protection the Project believes is appropriate for hazardous substances and health hazards for which there are no PELs or published exposure limits.

The Project shall not implement a schedule of employee rotation as a means of compliance with PELs or dose limits except when there is no other feasible way of complying with the airborne or dermal dose limits for ionizing radiation. The provisions of 29 CFR 1910, Subpart G, shall be followed.

5.1 Engineering Controls

Engineering controls are built into the process and designed to eliminate hazards. They include:

- Enclosure/encapsulation.
- Isolation or automation.
- Local and general exhaust.
- Material substitution.
- Wetting of soils before disturbance to eliminate dust generation.

5.2 Administrative Controls and General Work Practices

Administrative controls and general work practices are:

- Understand and follow H&S controls and procedures that govern work.
- Comply with IWPs/JSAs, RWPs, and Worker Safety and Health Program requirements.
- Attend briefings and safety meetings as required.
- Use the buddy system to ensure constant visual contact while performing work involving significant hazards or risk to personnel's health and safety (see Section 10.6).
- Wash hands and face on leaving the work area and before eating, drinking, chewing gum or tobacco, smoking, or applying cosmetics, sun screens, or lip creams.
- Stop work if you have a reasonable belief that it poses an immediate danger to yourself or others.

NOTE: Anyone who does not comply with H&S controls and procedures as established by this HASP is subject to immediate dismissal from the site.

5.2.1 Radiological Contamination Control Practices

Contamination control practices are:

- Consciously minimize contact with hazardous substances and avoid contact with the facial area.
- Immediately notify the RCM or member of the radiological group if contamination of the skin or clothing is suspected.

- Refrain from walking through suspected contaminated liquid or soil.
- Avoid high CAs unless entrance is required.
- Minimize the generation of hazardous waste and do not bring unnecessary materials into the CA.

5.3 PPE Controls

PPE is the last line of defense to control exposure to a hazardous substance. When using PPE, site workers shall be trained to:

- Know when or under what conditions each type of PPE is necessary.
- Know how to properly don, doff, adjust, and wear required PPE.
- Know the use and protection limits of PPE.
- Know the proper care, maintenance, useful life, and disposal of PPE.
- Use proper PPE assigned for the task or area.
- Ensure PPE fits properly.
- Ensure PPE is free of tears or holes and is in good working condition before entering the work area.
- Leave the area immediately if PPE is damaged.
- Inspect other workers' PPE and inform them of problems such as tears and holes.

Appropriate PPE shall be selected and used that will protect employees from the hazards and potential hazards they are likely to encounter as identified during the site characterization and analysis. PPE selection shall be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the Project site, the task-specific conditions, duration, and the hazards and potential hazards identified at the Project site. PPE shall be selected and used to meet the requirements of 29 CFR 1910, Subpart I, "Tools – Hand and Power," additional requirements specified in this HASP, and the *Moab UMTRA Project Personal Protective Equipment Procedure* (DOE-EM/GJ1619).

6.0 PPE

PPE shall be used by employees for each of the Project site tasks and operations being conducted as required by the *Personal Protective Equipment Procedure* and the *Health and Safety Suspected Hazardous Residual Radioactive Material Response Procedure* as applicable. The ESH&Q Manager or designee shall evaluate the PPE Program on a regular basis for effectiveness. Once the hazards of the site have been identified, the appropriate PPE shall be selected and used in accordance with the *Personal Protective Equipment Procedure* and the *Health and Safety Suspected Hazardous Residual Radioactive Material Response Procedure* as applicable.

7.0 Radiological, Safety, and Health Training

7.1 Site Access Training Requirements

7.1.1 Site Workers

Site workers are DOE, contractor, and subcontractor personnel who are assigned to work at the site and have completed training, qualification, and medical surveillance in accordance with this HASP before being given unescorted access into the CA.

For unescorted access to non-radiological controlled areas, site workers (i.e., DOE and contractor employees assigned to the site) shall complete:

- Project site pre-entry briefing.
- General employee training.
- Radiological awareness training.
- Heat stress training
- Cold stress training

For unescorted access to radiological areas posted as “Controlled Areas” (i.e., unescorted entry of a posted CA), site workers shall complete:

- Project site pre-entry briefing.
- General employee training.
- Radiological Worker II training.
- Heat stress training.
- Cold stress training.
- HAZWOPER training.

For unescorted access to controlled areas associated with the Moab site, Crescent Junction site, off-site operations, and vicinity properties, site workers shall complete:

- Site pre-entry briefing.
- General employee training.
- General employee radiological training.
- Heat stress training.
- Cold stress training.

7.1.2 Radiological Control Area Entry

The following provides minimum training requirements. Additional training requirements may be established based on the scope of work assigned to employees.

NOTE: A controlled area is establish to protect individuals from exposure to radiation and or radioactive materials. There are no significant radiation hazards in a Controlled Area. These areas usually surround other radiological areas that pose a risk and as such, require higher levels of control.

For unescorted access to radiological control area individuals must complete at a minimum the following:

- Project site pre-entry briefing. (SB100)
- Radiological awareness training – radiological information training, if applicable, or General Employee Radiological Training (GERT).

NOTE: Additional site training requirements may be applied based on Project prerequisites.

For unescorted access to radiological areas posted as a CA or Exclusion Zone (EZ) HAZWOPER site workers must complete at a minimum the following:

- Project site pre-entry briefing (SB100)
- Radiological Worker II training
- HAZWOPER Training

NOTE: Additional site training requirements may be applied based on Project prerequisites.

7.1.3 Visitor and Vendor Safety Briefing

To access the Moab, Crescent Junction, or Green River controlled areas, all visitors and vendors must follow the directions below depending on their classification as a visitor or a vendor.

Short-term Visitors (1-day or Less Visit)

- Visitors must be briefed on both site safety issues and basic general radiological information.
- Visitors are provided a copy of the General Site and Radiological Training handout for all.
- Visitors and vendors along with their associated maps.
- Visitors are expected to maintain a high degree of safety awareness and behave in a safe and considerate manner at all times to help achieve the goal of zero incidents or accidents.
- Visitors must be individually briefed on the hazards associated with their location and activities.
- Visitors are restricted to the general Administration Area as shown on the map.

Long-term Visitors (More than 1-day Visits)

- Must be briefed on site safety issues and complete GERT.
- Visitors are expected to maintain a high degree of safety awareness and behave in a safe and considerate manner at all times to help achieve the goal of **zero incidents or accidents**.
- Visitors must be individually briefed on the hazards associated with their location.
- Visitors are restricted to the General Administration Area as shown on the map.
- Complete signature acknowledgement on page 6 of the Visitor and Vendor Safety Brief and provide a copy to the Administrative Office or security guard.

NOTE: For visitors and vendors at the Crescent Junction site, the GERT training is only required if they enter into a Radiological Control Area, such as haul roads, shop area, and Radiological Buffer Areas (RBAs).

7.1.4 Hazardous Waste Operations and Emergency Response Training Requirements

Pre-entry briefings shall be held before initiating any site activity and at other such times as necessary to ensure employees are apprised of this HASP and that it is being followed. All employees working on site (e.g., operators, general laborers) with the potential for exposure to unknown concentrations of hazardous substances, health hazards, or safety hazards shall receive HAZWOPER training that meets the applicable requirements in 29 CFR 1910.120.

7.1.5 Informational Programs

The Project shall inform employees, contractors, and subcontractors (or their representative) actually engaged in hazardous waste operations of the nature, level, and degree of exposure likely as a result of participation in such hazardous waste operations. This shall be accomplished via training to a task-specific IWP/JSA; this requirement does not apply to employees, contractors, and subcontractors working outside of the operations part of a Project site are not covered by this requirement.

7.2 Daily Safety Meetings

DOE, contractor, and subcontractor employees shall attend a Daily Safety Meeting before commencing work activities. This Daily Safety Meeting will be the means for disseminating the information from the Plan of the Day (POD) to site personnel. Site workers who arrive to perform work after the Daily Safety Meeting has been conducted shall read the information presented at that day's meeting. Documentation of the Daily Safety Meeting shall include the topics discussed, planned activities, and the signature of each participant, including those who arrived and were briefed (by reading) after the meeting was conducted. Signing the Daily Safety Meeting roster acknowledges understanding of topics, activities taking place, and adherence to set requirements.

The Daily Safety Meeting will be led by the respective Operations Supervisor or his or her designee. The Operations Supervisor will use the Daily Safety Meeting Checklist (Form HS-F-043) as the means of disseminating this information and fostering discussion of the day's activities and any issues. Other Project supervisors, managers, and SMEs shall support the Operations Supervisor as needed during the Daily Safety Meeting.

Documentation of the Daily Safety Meeting shall include a copy of the POD, the Daily Safety Meeting Checklist, and the Pre-Job Brief/Safety Meeting Attendance Roster (Form HS-F-001).

Daily Safety Meeting topics should, at a minimum, include:

- Work planned for the day.
- Changes in site conditions and controls.
- Safety issues such as work area conditions, equipment, and behaviors.
- Weather forecast.
- Lessons learned.
- New SDS information.
- Periodic review of IWPs/JSAs and RWPs.
- Changes to the HASP.

7.3 Plan of the Day

Work activities shall be evaluated daily by management. The POD shall be documented using POD Form HS-F-042 and be made available to employees to review. The POD shall consist of authorized work activities, lead personnel, and the IWPs/JSAs associated with the activity.

The POD Form identifies all work activities to be performed over the specific work day for which the form was developed. For routine work activities, the POD Form identifies the specific work activities, as well as the applicable Lead and IWP/JSA. The POD Form also identifies any non-routine/non-standard work activities tours, visitors, deliveries, vendors, key-personnel absences, and training that are planned for that day. The POD Form also contains a Two Week Look-Ahead section, which provides information on expected activities taking place in the near term relative to non-routine work, visitors, tours, and training.

For work planning purposes the Operations/Site Managers identify a Lead that will be responsible for all aspects of planning and implementing the work. The Lead defines all of the elements of the work, resources required, hazards, controls, permits, and training requirements.

The Lead is responsible for coordinating implementation of the work with other operational activities, in part through participation in the POD.

Each Operations/Site Manager or designee chairs the POD meeting for work activities at their location, before the start of work for that day. For work activities conducted off site, such as on vicinity properties, or that impact both sites, such as rail hauling operations, the Operations/Site Managers will determine who is responsible for authorizing that work.

The draft POD is available electronically on the Moab Share Drive at M:\Plan of the Day and is labeled with a filename that includes the date. The electronic POD is completed for activities to be performed on the next working day, as well as activities planned through the following two weeks. Project supervisors and managers have write access to this folder. The draft POD process is as follows.

- Project supervisors and managers update their group's information on the draft electronic POD as they determine the appropriate work scope in the time preceding the Daily Safety Meeting for that date, preferably by the end of the preceding work day. They also include input from SMEs.
- If a formal Stop Work is put in place on the Project, the Operations/Site Manager for the affected site places that information on the draft POD.

At a minimum, each POD meeting will include a discussion of:

- Work for each group, including RAC operations, RAC transportation, TAC field operations, subcontract operations, and other hands-on work.
- Scheduled audits, tours, deliveries, or visits, including the sponsor for that event.
- Updates including activities, tours, and training over the next 2 weeks.

Each group conducting hands-on work shall use the POD to schedule and authorize work and must have a representative attend the POD meeting. If a group cannot send a representative to the meeting, they must notify the Operations/Site Manager before the POD meeting to have their work authorized. If they do not have their work authorized, it will be removed from the POD.

Changes made to the approved POD are made on a case-by-case basis, focusing primarily on hands-on work. Personnel adding an activity to the POD will inform the Operations/Site Manager, any potentially affected supervisors/managers, and the appropriate functional leads. The Operations/Site Manager will coordinate any potential conflicts and prioritize work for the scheduled period on the POD as it relates to these changes.

7.4 IWP/JSA and RWP Briefings

Before commencing physical work activity, site workers shall receive an IWP/JSA briefing. The IWP/JSA briefing shall include the IWP/JSA covering general site hazards and additional task-specific IWPs/JSAs associated with the work to be performed. If personnel will be working in a radiological area, they shall also receive the required task-specific RWP briefing(s) from a Radiological Control Technician (RCT) as determined by the RCM.

7.5 Training and Qualification Records

Records of training and qualification required by this section shall be maintained by the TAC Training organization. Employee training and qualification records shall be maintained in compliance with 10 CFR 851, 29 CFR 1910.120, and in accordance with applicable Project policies and procedures.

8.0 Medical Surveillance Program

8.1 Initial Baseline HAZWOPER Medical Surveillance

Medical examinations and consultations shall be made available by the Project for each employee covered under Section 8.5 of this HASP before assignment.

8.2 Annual HAZWOPER Medical Surveillance

Medical examinations and consultations shall be made available by the Project for each employee covered under Section 8.5 of this HASP at least once every year for each employee covered unless the attending physician believes a longer interval (i.e., not more than biennially) is appropriate.

8.3 Fitness for Duty Evaluation

10 CFR 851 requires contractor and subcontractor employees who will work on site for more than 30 days in a rolling 12-month period shall have a Fitness for Duty Evaluation performed by a qualified physician (i.e., licensed, registered, or certified as required in the state where employed) before commencing physical work activities or as soon as practical after activities have begun. Based on evaluation of tasks to be performed, the contractor may direct various levels of physical exams; physicals may not be required for some tasks.

8.4 Return to Work

The Operations/Site Manager and/or the TAC Technical Group/Field Manager shall inform H&S whenever an employee has been absent because of an injury or illness, whether personal or work-related, for more than 5 consecutive workdays (or an equivalent time period for those individuals on an alternative work schedule). The employee shall provide their supervisor with a doctor's release to return to work that shall be reviewed by H&S before the worker is authorized to resume work activities. Management may schedule a return to work fit for duty physical for the employee if it is deemed necessary.

8.5 Medical Examination Policy

The medical exam policy is:

- An annual medical examination by a qualified physician is required for employees who are or may be exposed to hazardous substances or health hazards at or above the established PEL and above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more each year.

- An annual medical examination by a qualified physician is required for employees who wear a respirator for 30 days or more each year or as required by *Moab UMTRA Project Respiratory Protection Program* (DOE-EM/GJ1620).
- A medical examination by a qualified physician is required for employees who are injured, become ill, or develop signs or symptoms due to possible exposure above occupational exposure limits involving hazardous substances or health hazards from an emergency response or hazardous waste operation.
- The need for medical examination by a qualified physician shall be evaluated for personnel exposed to asbestos, lead, radioactive isotopes, or excessive levels of noise, airborne dust, gases, and/or vapors.

NOTE: Medical examinations and consultations shall be made available by the Project to such employees as soon as possible upon notification by an employee that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards or that the employee has been injured or exposed above the PELs or published exposure levels in an emergency situation.

Medical examinations and consultations shall be made available by the Project to each employee covered under this section at termination of employment or reassignment to an area where the employee would not be covered if the employee has not had an examination within the last 6 months. Examinations and consultations shall be provided at more frequent intervals if the examining physician determines an increased frequency of examination is medically necessary. Medical examinations required by this section shall include a medical and work history (or updated history if one is in the employee's file) with special emphasis on symptoms related to the handling of hazardous substances and health hazards and to fitness for duty, including the ability to wear any required PPE under conditions (i.e., temperature extremes) that may be expected at the work site.

The content of medical examinations or consultations made available to employees shall be determined by the attending physician. The guidelines in Appendix D of the National Institute of Occupational Safety and Health's Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities should be consulted.

Examination by a Physician and Costs

All medical examinations made at the request of the employee's supervisor and/or H&S and associated procedures shall be performed by or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine, and shall be provided without cost to the employee, without loss of pay, and at reasonable times and locations. The employee is responsible for obtaining a fit for duty release from their physician in the event of a non-work-related absence.

Information Provided to the Physician

The Project shall provide a copy of this Plan to the attending physician and the following additional information for each employee.

- A description of the employee's duties as they relate to the employee's exposures.
- The employee's exposure levels or anticipated exposure levels.
- A description of any PPE used or to be used.

- Information from previous medical examinations of the employee that is not readily available to the examining physician.
- Information required by 29 CFR 1910.134, “Respiratory protection.”

Information Provided to the Employee

The Project shall obtain and furnish the employee with a copy of a written opinion from the examining physician that contains the following.

- The physician’s opinion as to whether the employee has any detected medical conditions that would place the employee at increased risk of material impairment of the employee’s health from work in hazardous waste operations, emergency response, or from respirator use.
- The physician’s recommended limitations on the employee’s assigned work.
- The results of the medical examination and tests if requested by the employee.
- A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions that require further examination or treatment.
- The written opinion obtained by the Project shall not reveal specific findings or diagnoses unrelated to occupational exposure.

8.6 Emergency Treatment Facility

The nearest medical and primary emergency treatment facility associated with the Moab and Crescent Junction sites and its location is:

Moab Regional Hospital
 450 Williams Way
 Moab, Utah
 435-719-3500

The nearest medical and primary emergency treatment facility associated with the Grand Junction office is:

St. Mary’s Medical Center
 2635 North 7th Street
 Grand Junction, Colorado 81501
 970-298-2273

Routes to transport injured or ill employees to emergency treatment facilities are provided in Figures 4 and 5.

9.0 Worker Exposure Monitoring

Personnel and area monitoring shall be conducted to determine the exposure potential of site workers to hazardous substances. This monitoring can include personnel or area air samples, surface wipes, and soil samples. The frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment, is covered by the *Industrial Hygiene Program* and its associated sampling and monitoring procedures.

The following monitoring shall be conducted during initial site entry when the site evaluation produces information that shows the potential for ionizing radiation or IDLH conditions or when the site information is not sufficient to eliminate these possible conditions:

- Monitoring with direct reading instruments for hazardous levels of ionizing radiation.
- Monitoring the air with appropriate direct reading test equipment for (e.g., combustible gas meters, detector tubes) for IDLH and other conditions that may cause death or serious harm (e.g., combustible or explosive atmospheres, oxygen deficiency, toxic substances.)
- Watching for signs of actual or potential IDLH or other dangerous conditions.
- Implementing an ongoing Air Monitoring Program in accordance with the Industrial Hygiene Program after site characterization has determined the Project site is safe for the startup of operations.

Monitoring shall be performed in accordance with this HASP and the *Industrial Hygiene Program* when there may be a question of employee exposure to hazardous concentrations of hazardous substances to ensure proper selection of engineering controls, work practices, and PPE so that employees are not exposed to levels that exceed PELs, or published exposure levels if there are no PELs, for hazardous substances.

Air monitoring shall be used to identify and quantify airborne levels of hazardous substances and safety and health hazards to determine the appropriate level of employee protection needed on site.

9.1 Exposure Monitoring Methods

Industrial hygiene monitoring that represents TWA exposure levels in worker breathing zones shall be performed for each identified task that has a potential for exposure in accordance with the *Industrial Hygiene Program*. Radiological surveys shall be performed in accordance with the *Moab UMTRA Project Health Physics Plan* (DOE-EM/GJ3003).

9.2 Action Levels

The Action Levels (ALs) in Table 4 shall be used to ensure the appropriate level of worker protection is maintained. PPE assigned in accordance with Section 6.0 of this HASP shall provide a level of protection that ensures exposures will not exceed ALs for known or suspected site hazards until such time as monitoring indicates that a downgrade in PPE is warranted.

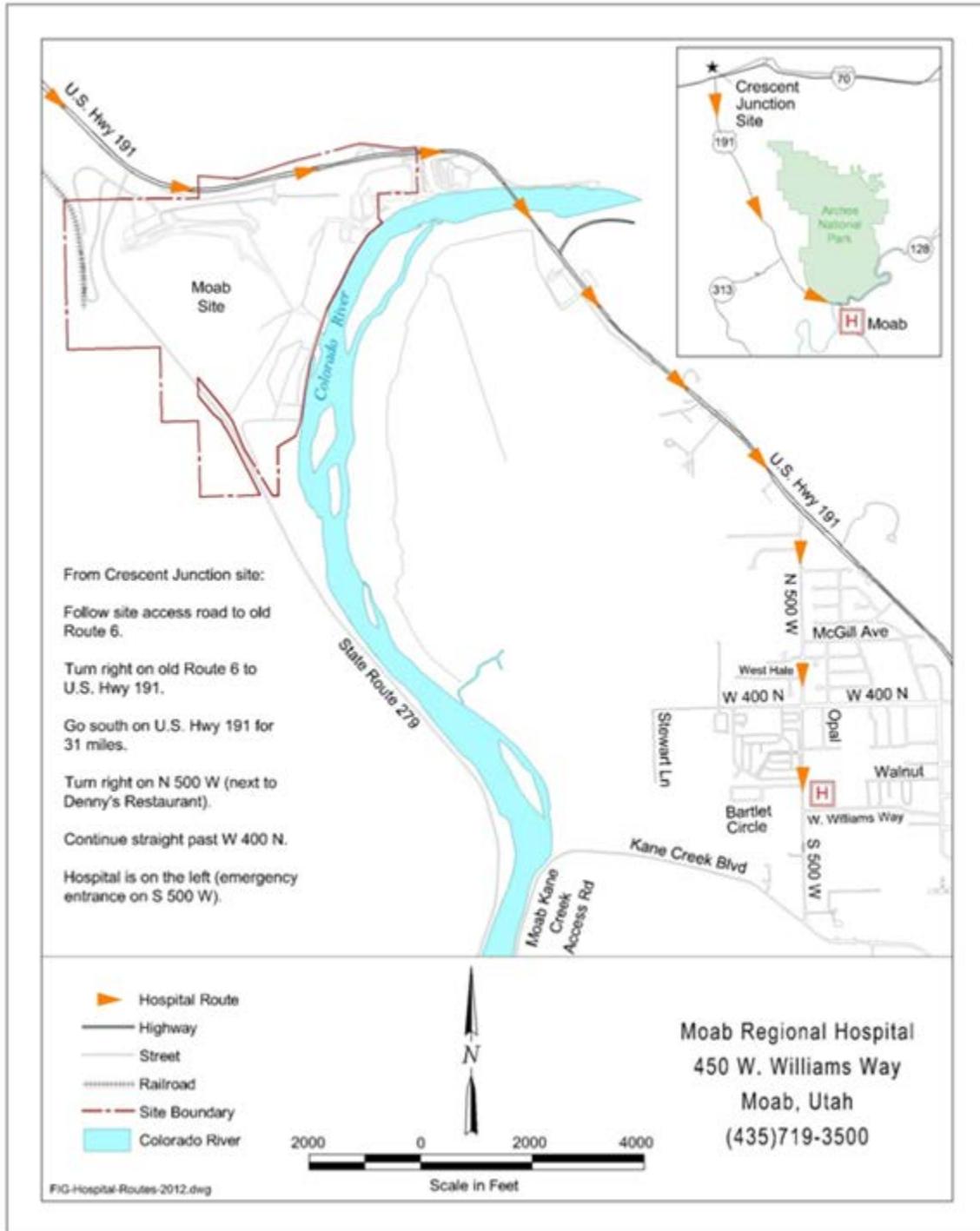
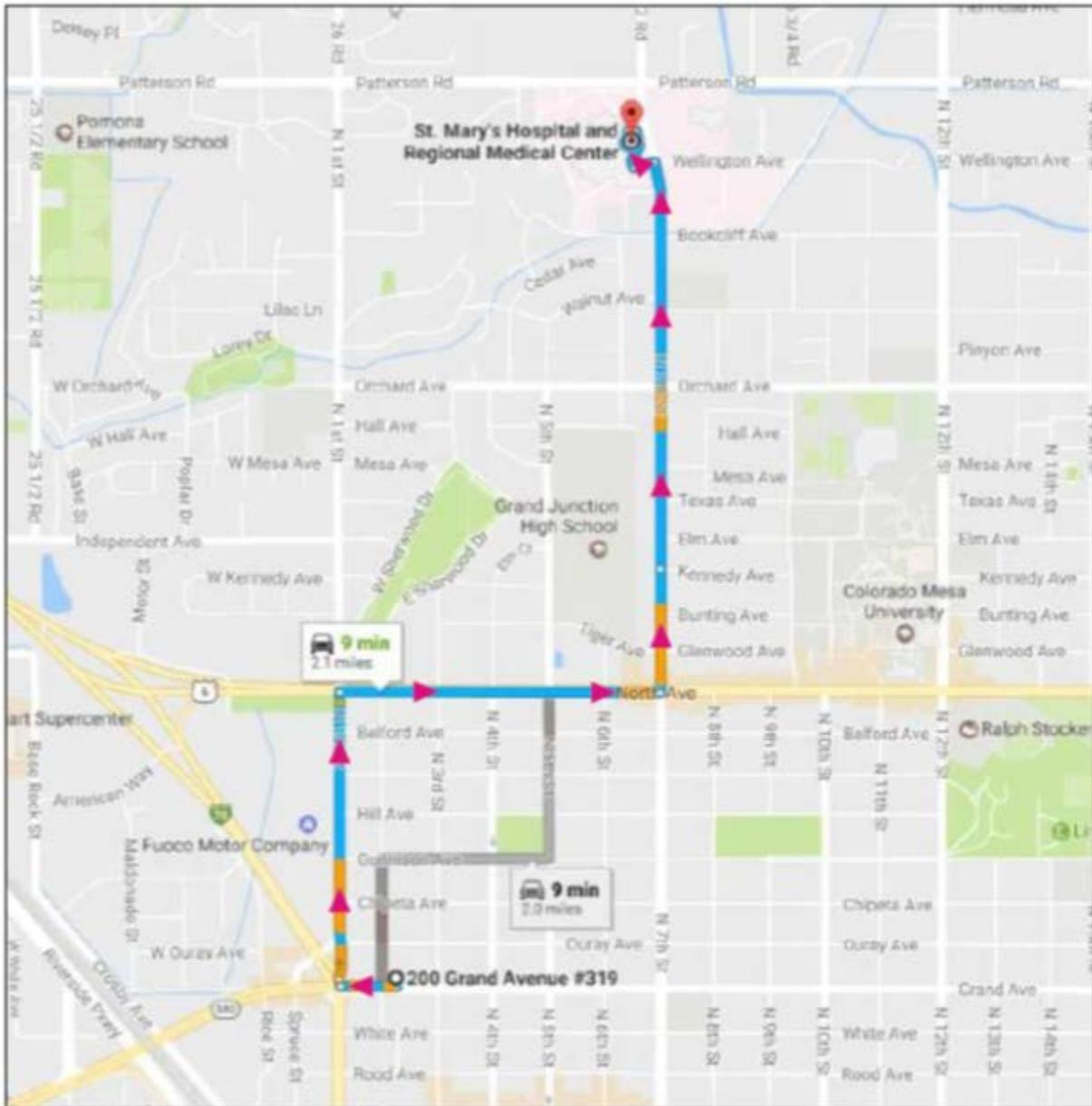


Figure 4. Travel Routes from Moab and Crescent Junction Sites to Moab Regional Hospital



- ▶▶ Hospital Route
- Highway
- Road



St. Mary's Hospital
 2635 N 7th St, Grand
 Junction Grand
 Junction, CO 81501
 (970) 298-2273

Figure 5. Travel Routes from Grand Junction Office to St. Mary's Hospital

Table 4. Personnel Exposure ALs

Parameter	Action Level	Action Required
External Radiation Dose Rate	>5 mrem/hr at 1 foot (30 cm) from source	Establish Radiation Area controls in accordance with <i>Radiation Protection Program</i> and assign dosimetry.
Annual Radiation Exposure	>100 mrem/yr TEDE and/or >500 mrem/yr from radon or radon progeny	Radiological Worker Training and assign dosimetry.
Radiological Surface Contamination	Removable contamination 1,000 dpm/100 cm ² or total contamination 5,000 dpm/100 cm ²	Establish applicable CA controls in accordance with <i>Radiation Protection Program</i> .
Airborne Radioactivity	Long-lived radioparticulate activity $\geq 10\%$ of 5×10^{-11} $\mu\text{Ci/ml}$ or radon daughter concentration $\geq 10\%$ of 0.33 working levels.	Establish applicable Airborne Radioactivity Area controls in accordance with 10 CFR 835.
Soil Contamination	1. Ra-226 activity exceeds the environmental cleanup standard but is ≤ 100 pCi/g 2. Ra-226 activity >100 pCi/g	1. Establish soil CA controls in accordance with the <i>Radiation Protection Program</i> . 2. Establish CA controls in accordance with the <i>Radiation Protection Program</i> .
O ₂	<19.5% or >23.5% O ₂	Evacuate area, ventilate, and continuously monitor until O ₂ is between 20% and 23%.
Combustible Gas	1. >5% LEL 2. >10% LEL	1. Stop work and control source. Continuously monitor until LEL <3%. 2. Evacuate area. Evaluate hazard and engineering controls. Identify and eliminate or reduce source. Provide mechanical ventilation to the area as necessary.
CO	>12.5 ppm	Evaluate hazard and engineering controls. Identify and eliminate or reduce source. Provide mechanical ventilation to the area as necessary. Continuously monitor until CO <10 ppm.
Chemicals with PELs and/or TLVs	$\geq 50\%$ of PEL/TLV	Evacuate and evaluate situation. Evaluate hazard and engineering controls. Identify and eliminate or reduce source. Provide mechanical ventilation to the area as necessary. Do not enter the area. Use instrumentation with remote sensing capability (e.g., extended instrument input, telemetry) to monitor area with continued elevated reading.
Asbestos	Action level is 0.05 fibers per cm ³	All ACM shall be managed in accordance with 29 CFR 1910.1001 and 29 CFR 1926.1101. If asbestos is suspected, work shall be suspended, and the H&S Manager or appropriate member of the H&S staff shall be contacted to perform an inspection and coordinate sampling, if necessary.
Noise	≥ 85 dBA	Institute engineering controls, administrative controls, and/or implement hearing conservation program enrollment and the use of properly attenuated personal hearing protection.
Heat Stress	Workers monitored when temperatures expected to exceed 80° F	Refer to <i>Heat Stress Procedure</i> .

Table 4. Personnel Exposure ALs (continued)

Parameter	Action Level	Action Required
Lightning	Visible lightning within approximately 3 miles	<p>When lightning is visible, thunder is audible, and a storm appears to be within (approximately) 3 miles, Project employees working outdoors shall leave high points (e.g., roofs, ladders). Operators in tracked equipment will be picked up by an enclosed vehicle with rubber tires (e.g., crew van). Personnel in exposed areas (e.g., open areas, top of a cell) shall go inside a properly grounded building or an enclosed vehicle with rubber tires.</p> <p>When a lightning shutdown is ordered, it will remain in effect for 20 minutes after the last strike within the 3-mile limit; at that time, when a lightning shutdown is ordered, it will remain in effect for 20 minutes after the last strike within the 3-mile limit; at that time, H&S will lift the lightning shutdown and allow work activities to resume.</p>

CO = carbon monoxide; cm = centimeters; dpm = disintegrations per minute; hr = hour; LEL = lower exposure limit; mrem = millirems; O₂ = oxygen; pCi/g = picocuries per gram; µCi/ml = microcuries per milliliter; ppm = parts per million; TEDE = total effective dose equivalency; VOC = volatile organic compound

10.0 Project Site Control

10.1 Site Security

Signboards with contact information shall be placed at site entrances. Site control is generally established by a perimeter fence. Security guards are provided for site access control during production hours and off-shift hours as determined by each Operations/Site Manager.

10.2 Site Map

A map that shows work areas, the route of travel to the nearest emergency medical facility (as shown in Figures 4 and 5), and site evacuation routes shall be posted and available to personnel. A map of site facilities, including locations of fire extinguishers, first-aid stations, first-aid kits, and evacuation assembly areas shall be posted in each occupied trailer/building.

10.3 HAZWOPER Site Work Zones

To reduce the spread of hazardous substances from hazardous areas to clean areas, zones shall be delineated on the site where different types of operations will occur, and the flow of personnel among the zones should be controlled.

Three frequently used zones in HAZWOPER are the EZ, Contamination Reduction Zone (CRZ), and Support Zone (SZ) as follows:

- EZ –The EZ is where the highest possibility for worker exposure to hazardous materials occurs. The CA boundaries at the Moab and Crescent Junction sites are also the EZ boundaries for HAZWOPER operations.
- CRZ – The area where decontamination takes place. The entry/exit routes between the EZ and the SZ are in the CRZ. The CRZ may include an RBA.

- RBA – An intermediate area established to prevent the spread of radioactive contamination and to protect personnel from radiation exposure
- SZ – The uncontaminated area to which general public access is controlled and where workers should not be exposed to hazardous substances. The SZ is a clean area where administrative and support functions are located. Normal work clothes are appropriate for the SZ. The SZ may be posted as a controlled area.

10.4 Site Access Log

The site access log shall be maintained at the administration office, and non-permanent site personnel shall complete it when they arrive and depart the site. The site access log information should include the date, name, company or agency, and time of entry and exit. In addition, access to the CA shall be recorded on a radiological access and egress log, or equivalent.

Visitors shall check in, sign the visitor log immediately on arrival, and complete required visitor briefing orientation. Only visitors with legitimate reason and who are authorized by the Operations/Site Manager and H&S will be allowed access to the work areas. Each visitor or group of visitors shall be escorted by a qualified person and will be issued a visitor badge (except for visiting groups larger than eight persons who are not badged and only escorted).

10.5 Buddy System

A buddy system shall be implemented when a task is to be performed in an area where the potential for significant hazards or risk to personnel health and safety may exist. A hazard analysis by H&S or designee is performed during work planning as part of the IWP/JSA process. The applicable IWP/JSA will identify what activities require the use of a buddy system.

A buddy system is two or more individuals assigned to work together as a team to perform a task. The buddies should be close enough to one another to communicate verbally without the aid of radios, telephones, or other means of voice amplification, and to provide immediate assistance to one another if necessary.

Workers using the buddy system must:

- Stay within visual and clear voice communication distance with the partner(s).
- Observe the partner(s) for signs of overexposure to hazardous materials and environmental stresses, such as heat and cold exposure.
- Periodically check the integrity of the partner's PPE.
- Immediately notify the Operations/Site Manager, partner's supervisor, or H&S Manager if emergency assistance is needed.

10.6 Radiological Area Access Control

10.6.1 Access Control Point Requirements

Access to the CA shall be controlled through a designated access control point. The access control point shall be physically secured (e.g., fences, ropes, barricades) and clearly marked with signs according to the *Health Physics Plan*.

Personnel and equipment shall enter and exit the CA through the access control point unless an alternative location has been approved by Radiological Control.

10.6.2 Signs, Signals, and Barricades

Signs, signals, and barricades used to identify radiological hazards shall comply with the *Health Physics Plan*. Signs, signals, and barricades used to identify other site hazards (including traffic control) shall comply with 29 CFR 1926, Subpart G, “Signs, Signals, and Barricades.”

10.7 Site Communications

10.7.1 On-site Communications

Each person shall establish communications with on-site personnel with whom he or she may need to communicate. Communication must be maintained between each site worker or group of workers and on-site personnel.

No site worker shall access the site(s) to perform work without having at least one other site worker who:

- Is aware of the work (activity) being done on the site.
- Is in communication with the worker(s) on the site.
- Is able to communicate with off-site personnel and immediately summon emergency assistance should it become necessary.

10.7.2 Off-site Communications

When a site worker is off site, they shall notify another person that they are off site and make notification when they return. If site workers are off site performing work, they must be capable of immediately communicating with on-site personnel.

The off-site workers must be capable of notifying Project key personnel in accordance with the *Contact Information List* and executing the *Emergency/Incident Response Plan*, if necessary.

10.7.3 Emergency Alert Methods

Emergency alert actions are outlined in Section 4.0 of the *Emergency/Incident Response Plan*. During emergency and off-normal events, several methods are used to notify workers of the situation; the most common and effective methods are by two-way radios and cell phones. At both Moab and Crescent Junction, a radio channel has been designated for emergency use during an event. When an emergency is declared, the designated channel is cleared and used only for emergency communications and directions to be taken during the event.

The channel used by each site is posted at the site and is reviewed with the workers at pre-shift safety meetings throughout the year. In accordance with 29 CFR 1910.165, “Employee alarm systems,” the Project shall test the reliability and adequacy of notification methods (e.g., base station radios) each month, preferably on the first of the month (in conjunction with safety equipment inspections). A different actuation device (e.g., radio) shall be used in each test of a multi-actuation device system, such as the system at the Moab site, so that no individual device is used for two consecutive tests.

A personnel lanyard card that designates site radio channels, including the emergency channel to be used, was created and distributed to employees. Cell phones are used when communication is needed where radio coverage is not available and to summon off-site emergency responders. Cell phones are also very effective when a lengthy conversation needs to take place as this does not tie up the radio channel by supervision and management. It is also effective for communications that are not appropriate to transmit over the radio (e.g., condition of any victims, trying to locate a worker that is unaccounted for, contacting personnel out of radio range).

On notification of an emergency, the RAC Emergency Response Director (*Incident Commander*) or designee will notify the TAC Senior Program Manager or RAC Project Manager, the DOE ESH&QA Manager, and the FCD. Notifications to agencies and organizations other than the contractors and DOE are determined by the FPC. Supplemental actions are determined by the RAC Emergency Response Director (*Incident Commander*) and should be carried out as quickly as is reasonable after immediate actions are completed.

The main responsibility for communication with the public during emergencies falls on the FCD and TAC Public Affairs Manager. Appendix B of the Emergency Public Information Plan addresses the requirements in DOE O 151.1D, "Comprehensive Emergency Management System," for an Emergency Public Information Plan and addresses public affairs activities in emergency situations to ensure necessary actions will be planned and coordinated.

10.8 H&S Inspections

The Operations/Site Manager, H&S, and assigned line management personnel shall perform frequent inspections of active work locations to verify HASP implementation and effectiveness. The inspections shall be documented, follow-up corrective actions shall be identified and tracked to completion, and a report shall be sent to Records Management, as required. In addition, inspections shall also be conducted by the RAC ESH&Q Manager, TAC HS&T Manager or, in the absence of those individuals, another person who is knowledgeable in occupational safety and health, acting on behalf of the Project as necessary to determine the effectiveness of this HASP. Any deficiencies in the effectiveness of this HASP shall be corrected by the Project.

10.9 Sanitation

The sanitation requirements of this section, other than the requirements set for inside the CA, are based on 29 CFR 1926.51, "Sanitation," and 29 CFR 1910.141, "Sanitation." The following accommodations shall be provided for site workers.

10.10 Water

The following subsections detail drinking water provisions inside and outside the CA.

Potable

An adequate supply of potable water shall be provided on Project sites.

Outside CA

Provisions for drinking water outside the CA:

- Potable water adequate for the number of workers at the site in containers with a tight-fitting cap.
- Water dispensers (if used) shall be designed, constructed, and serviced so that sanitary conditions are maintained, shall be capable of being closed, and shall be equipped with a tap to dispense the water. Water shall not be dipped from the container.
- Containers used to dispense drinking water shall be clearly marked for exclusive use as a drinking water container.
- Single-serve disposable cups, a sanitary container for the unused cups, and a receptacle for the used cups shall be made available.

Inside the CA

Drinking water in the CA shall be considered only when the two following conditions are met as determined by the contractor and controlled by an RCT.

1. Potential for heat-induced stress is present and represents a significant hazard compared with the radiological and chemical hazards present.
2. Administrative and engineering controls to reduce the potential for heat-induced stress in workers on site performing a specific task are either ineffective or not reasonable and prudent without the inclusion of additional hydration for personnel.

The consumption of drinking water in the CA is only permitted when the two conditions above are met. When it is determined that drinking will be permitted, the following controls are required.

- Drinking containers shall be protected from contacting hazardous substances before they are issued to the worker.
- Drinking containers shall be sealed, single-serve, and disposable.
- The participating workers shall remove their outer gloves and frisk their hands and face. If contamination is detected, the worker shall proceed to an access control point for radiological survey by an RCT.
- If the worker's hands and face frisk clean, the worker may wash his or her face with wet wipes.
- Drinking containers and wet wipes may not be shared among workers.
- Drinking containers shall be disposed of after single use. Workers may not reseal the container and save contents for later consumption.
- Workers shall don PPE as required before returning to the work area.

Non-potable

Outlets for non-potable water, such as water for firefighting purposes, shall be identified to clearly indicate that the water is unsafe and is not to be used for drinking, washing, or cooking purposes. There shall be no cross-connection, open or potential, between a system furnishing potable water and another furnishing non-potable water.

10.10.1 Toilet and Washing Facilities

Toilet and washing facilities shall be provided. Toilet facilities shall be provided in the following quantities based on number of Project site employees.

- One facility for 20 or fewer employees
- One toilet seat and one urinal per each 40 employees for between 20 and 200 employees
- One toilet seat and one urinal per each 50 employees for more than 200 employees

Under temporary field conditions, provisions shall be made to ensure at least one toilet facility is available. Hazardous waste sites not provided with a sanitary sewer shall be provided with the following toilet facilities unless prohibited by local codes.

- Chemical toilets
- Recirculating toilets
- Combustion toilets
- Flush toilets

The requirements of this section for sanitation facilities shall not apply to mobile crews having transportation readily available to nearby toilet facilities. Doors entering toilet facilities shall be provided with entrance locks controlled from inside the facility.

The Project shall provide adequate washing facilities for employees engaged in operations when hazardous substances may be harmful. Such facilities shall be in near proximity to the worksite, in areas where exposures are below PELs, under the controls of the Project, and equipped to enable employees to remove hazardous substances from themselves.

Washing facilities shall:

- Use potable water or another method (hand soap or similar cleansing agents shall be provided). Potable wash water containers shall be clearly marked for exclusive use as washing water containers, including prohibition of drinking.
- Be in the immediate vicinity of toilet facilities.
- Individual hand towels (or sections of towels), of cloth or paper, air blowers, or clean individual sections of continuous cloth toweling, convenient to the lavatories, shall be provided.
- Washing facilities shall be maintained in a sanitary condition.

10.10.2 Showers and Change Rooms

Because worker exposures to hazardous substances are not expected to exceed the applicable PELs, sanitation showers are not expected to be required. Sanitation showers may be required and shall be provided before work proceeds if:

- Site conditions change so that present evaluations are not applicable.
- Monitoring data indicate personnel are routinely exposed above the applicable PELs/TLVs.
- OSHA substance-specific standards (i.e., asbestos regulations) require showers and changing rooms.

When hazardous waste cleanup or removal operations commence on a Project site, and the duration of the work will require 6 months or more to complete, the Project shall provide showers and change rooms for all employees exposed to hazardous substances and health hazards involved in hazardous waste cleanup or removal operations.

Showers shall be provided and shall meet the following requirements.

- One shower shall be provided for each 10 employees of each gender, or numerical fraction thereof, who are required to shower during the same shift.
- Body soap or other appropriate cleansing agents convenient to the showers shall be provided.
- Showers shall be provided with hot and cold water feeding a common discharge line.
- Employees who use showers shall be provided with individual clean towels.

Whenever employees are required to wear protective clothing because of the possibility of contamination with toxic materials, change rooms equipped with storage facilities for street clothes and separate storage facilities for the protective clothing shall be provided. Change rooms shall consist of two distinct change areas separated by the shower area required in this section. One change area, with an exit leading off the worksite, shall provide employees with a clean area where they can remove, store, and put on street clothing. The second area, with an exit to the work site, shall provide employees with an area where they can put on, remove, and store work clothing and PPE.

Showers and change rooms shall be located in areas where exposures are below PELs and published exposure levels. If this cannot be accomplished, a ventilation system shall be provided to supply air below the PELs and published exposure levels.

The Project shall ensure employees potentially exposed during hazardous waste cleanup or removal operations shower at the end of their work shift and when leaving the hazardous waste site.

10.10.3 Smoking

Smoking is not allowed within posted radiological areas (e.g., CA) or within 50 feet of flammable or combustible liquids or gases. Smoking is only allowed in designated areas. Smoking shall be at a minimum 25 feet away from ventilation intakes, doors, and windows. Receptacles for extinguishing and disposing smoking material should be placed in designated smoking areas.

10.10.4 Housekeeping

The following housekeeping rules shall be adhered to.

- All work areas, passageways, storerooms, and service rooms must be kept clean, orderly, and in a sanitary condition.
- The floor of every workroom must be maintained in a clean and, as far as possible, dry condition. When wet processes are used, drainage must be maintained and false floors, platforms, mats, or other dry places for standing should be provided where practicable.
- Solid or liquid waste, refuse, and garbage must be removed to avoid creating a threat to health.
- Floors are to be swept as often as necessary to maintain the workplace in a sanitary condition.

10.10.5 Standard Operating Procedures/Safe Work Practices

Standard operating procedures and safe work practices are covered in Project plans, programs, procedures, and the general and task-specific IWP/JSAs and are located on the Project's SharePoint website.

10.10.6 Food Handling

All food service facilities and operations for employees shall meet the applicable laws, ordinances, and regulations of the jurisdictions in which they are located.

11.0 Decontamination

11.1 Radiological Decontamination

11.1.1 Radiological Contamination Prevention

Minimizing worker contact with hazardous substances starts by working in a safe manner so that contact is avoided as much as possible. Workers should avoid touching exposed portions of skin or personal clothing while in the CA.

11.1.2 Radiological Decontamination Location and Layout

Radiological Control staff shall help the Operations/Site Manager establish the location and layout of the CA access points along with PPE removal and decontamination stations. Radiological decontamination shall follow the *Radiation Protection Program* and the *Health Physics Plan* when applicable.

11.1.3 Personnel Radiological Decontamination

PPE removal, including proper sequence and technique, is the primary method by which personnel contamination is avoided on these sites. When radiological contamination in excess of the surface contamination limits is present in the work area, personnel shall perform whole-body contamination surveys following PPE removal and before exiting the CA. At a minimum, a hand and foot survey is required for personnel exiting an RBA.

After the PPE removal sequence has been completed, if radioactive contamination is detected on the worker during the survey, personnel shall contact an RCT immediately. The *Radiation Protection Program* and the *Health Physics Plan* shall be followed as applicable in the event of a personal contamination event.

Emergency Eyewash Stations

Emergency eyewash stations shall be provided at the site and strategically located as needed in accordance with 29 CFR 1910.151, "Medical services and first aid."

Emergency Shower Station

Emergency shower stations shall be provided at the site and strategically located as needed in accordance with 29 CFR 1910.151.

11.1.4 Material, Equipment, and Vehicle Radiological Decontamination

Materials, equipment, and vehicles leaving the CA will be subject to a radiological survey for release by an RCT. After residual visible material is removed, the item shall be surveyed in accordance with the *Radiation Protection Program* and the *Health Physics Plan*, when applicable.

11.1.5 Radiological PPE and Decontamination Solution Storage and Disposal

PPE removed from the CA shall be either decontaminated or properly bagged to contain contamination. Used disposable clothing shall be placed in bags, marked or labeled as required, and stored in a designated storage location pending arrangements for disposal.

Items that cannot be sufficiently decontaminated shall be evaluated by the RCM and Environmental Compliance staff and designated as radioactive, hazardous, or mixed waste and stored and disposed of in accordance with the *Radiation Protection Program*.

Decontamination solutions shall be collected and retained for evaluation and proper disposal in accordance with the *Waste Management Plan*.

11.2 Non-Radioactive Hazardous Substance Decontamination

Refer to the *Health and Safety Suspected Hazardous Residual Radioactive Material Response Procedure*, located on the Project's SharePoint website.

12.0 Emergency/Incident Response Plan

Refer to the *Emergency/Incident Response Plan*, located on the Project's SharePoint website.

13.0 Spill Response Plan

Project spill response shall be performed in accordance with the *Spill Prevention, Control, and Countermeasures Plan* to prevent, contain, and report spills of petroleum products and other hazardous substances. Spills of RRM at Project sites will be handled in accordance with the *Moab UMTRA Project Radiation Protection Program Manual* (DOE-EM/GJRAC1885).

14.0 Handling Containers

14.1 Drums and Containers

Drums and containers used during hazardous waste cleanup shall meet the appropriate Department of Transportation (DOT), OSHA, and U.S. Environmental Protection Agency (EPA) regulations for the wastes they contain. When practical, drums and containers shall be inspected and their integrity ensured before being moved. Drums or containers that cannot be inspected before being moved because of storage conditions (e.g., buried beneath the earth, stacked behind other drums, stacked several tiers high in a pile) shall be moved to an accessible location and inspected before further handling.

Unlabeled drums and containers shall be assumed to contain hazardous substances and handled accordingly until the contents are positively identified and labeled. Site operations shall be organized to minimize the amount of drum or container movement. Before moving drums or containers, all employees exposed to the transfer operation shall be warned of the potential hazards associated with the contents of the drums or containers.

DOT-specified salvage drums or containers and suitable quantities of proper absorbent shall be kept available and used in areas where spills, leaks, or ruptures may occur. Where major spills may occur, the *Spill Prevention, Control, and Countermeasures Plan* shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred.

Drums and containers that cannot be moved without rupture, leakage, or spillage shall be emptied into a sound container using a device classified for the material being transferred.

Soil or covering material shall be removed with caution to prevent drum or container rupture. Fire extinguishing equipment that meets requirements of 29 CFR 1910, Subpart L, "Fire Protection," shall be on hand and ready for use to control incipient fires.

Opening Drums and Containers

The following procedures shall be followed in areas where drums or containers are opened.

- When an airline respirator system is used, connections to the air supply source shall be protected from contamination, and the entire system shall be protected from physical damage.
- Employees not actually involved in opening drums or containers shall be kept a safe distance from the drums or containers being opened.
- If employees must work near or adjacent to drums or containers being opened, a suitable shield that does not interfere with the work operation shall be placed between the employee and the drums or containers being opened to protect the employee in case of accidental explosion.
- Controls for drum or container opening equipment, monitoring equipment, and fire-suppression equipment shall be located behind the explosion-resistant barrier.
- When there is a reasonable possibility of flammable atmospheres being present, material handling equipment and hand tools shall be of the type to prevent sources of ignition.
- Drums and containers shall be opened in such a manner that excess interior pressure will be safely relieved. If pressure cannot be relieved from a remote location, appropriate shielding shall be placed between the employee and the drums or containers to reduce the risk of employee injury.
- Employees shall not stand upon or work from drums or containers.

Material Handling Equipment

Material handling equipment used to transfer drums and containers shall be selected, positioned, and operated to minimize sources of ignition related to the equipment from igniting vapors released from ruptured drums or containers.

Radioactive Wastes

Drums and containers containing radioactive wastes shall not be handled until such time as their hazard to employees is properly assessed.

Shock-sensitive Wastes

As a minimum, the following special precautions shall be taken when drums and containers containing or suspected of containing shock-sensitive wastes are handled.

- All non-essential employees shall be evacuated from the area of transfer.
- Material handling equipment shall be provided with explosive containment devices or protective shields to protect equipment operators from exploding containers.
- An employee alarm system capable of being perceived above surrounding light and noise conditions shall be used to signal the commencement and completion of explosive waste-handling activities.
- Continuous communications (e.g., portable radios, hand signals, telephones) shall be maintained between the employee in charge of the immediate handling area and both the site H&S supervisor and the command post until such time as the handling operation is completed. Communication equipment or methods that could cause shock-sensitive materials to explode shall not be used.

- Drums and containers under pressure, indicated by bulging or swelling, shall not be moved until the cause for excess pressure is determined, and appropriate containment procedures have been implemented to protect employees from explosive release of the drum.
- Drums and containers containing packaged laboratory wastes shall be considered to contain shock-sensitive or explosive materials until they have been characterized.

CAUTION: Shipping shock-sensitive wastes may be prohibited under DOT regulations. The Project and its shippers shall refer to 49 CFR 173.21, “Forbidden materials and packages,” and 173.50, “Class 1 Definitions.”

14.2 Laboratory Waste Packs

Lab packs shall be opened only when necessary and only by an individual knowledgeable in the inspection, classification, and segregation of the containers within the pack according to the hazards of the wastes. If crystalline material is noted on any container, the contents shall be handled as a shock-sensitive waste until the contents are identified.

14.3 Sampling

Sampling containers and drums shall be done in accordance with the *Industrial Hygiene Program* and its associated sampling and monitoring procedures developed for and available to employees and others at the specific Project worksite.

14.4 Shipping and Transport

Drums and containers shall be identified and classified before packaging for shipment. Drum- or container-staging areas shall be kept to the minimum number necessary to safely identify and classify materials and prepare them for transport. Staging areas shall be provided with adequate access and egress routes. Bulking of hazardous wastes shall be permitted only after a thorough characterization of the materials has been completed.

14.5 Tanks and Vaults

Tanks and vaults containing hazardous substances shall be handled in a manner similar to that for drums and containers, taking into consideration the size of the tank or vault. The *Confined Space Entry Procedure* shall be followed whenever employees must enter a tank or vault. The ESH&Q Manager or designee shall also determine the need to develop a specific IWP/JSA whenever employees must enter a tank or vault.

15.0 References

10 CFR 835 (Code of Federal Regulations), “Occupational Radiation Protection.”

10 CFR 851 (Code of Federal Regulations), “Worker Safety and Health Program.”

29 CFR 1910 (Code of Federal Regulations), “Occupational Safety and Health Standards – General Industry.”

29 CFR 1926 (Code of Federal Regulations), “Safety and Health Regulations for Construction.”

49 CFR 173 (Code of Federal Regulations), “Shippers – General Requirements for Shipments and Packaging.”

42 USC 2210 (United States Code), Price-Anderson Amendments Act.

42 USC 6901 (United States Code), Resource Conservation and Recovery Act..

42 USC 7901 (United States Code), Uranium Mill Tailings Radiation Control Act.

DOE (U.S. Department of Energy), *Moab UMTRA Project 851 Worker Safety and Health Program Description* (DOE-EM/GJ3002).

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DOE (U.S. Department of Energy), *Moab UMTRA Project Control of Hot Work Procedure* (DOE-EM/GJRAC1953).

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DOE (U.S. Department of Energy), *Moab UMTRA Project Electrical Safety Procedure* (DOE-EM/GJ1551).

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DOE (U.S. Department of Energy), *Moab UMTRA Project Excavation and Trenching Procedure* (DOE-EM/GJ1609).

DOE (U.S. Department of Energy), *Moab UMTRA Project Fall Prevention and Protection Procedure* (DOE-EM/GJ1610).

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DOE (U.S. Department of Energy), *Federal Integrated Safety Management System Description* (DOE-EM/GJF1637).

DOE (U.S. Department of Energy), *Moab UMTRA Project Fire Safety Procedure* (DOE-EM/GJ1555).

DOE (U.S. Department of Energy), *Moab UMTRA Project FY2016 Emergency Readiness Assurance Plan* (DOE-EM/GJ2224).

DOE (U.S. Department of Energy), *Moab UMTRA Project Hazard Communication Program* (DOE-EM/GJ1605).

DOE (U.S. Department of Energy), *Moab UMTRA Project Hazardous Categorization* (DOE-EM/GJRAC1722).

DOE (U.S. Department of Energy), *Moab UMTRA Project Hazards Survey* (DOE-EM/GJ2055).

DOE (U.S. Department of Energy), *Moab UMTRA Project Health and Safety Suspected Hazardous Residual Radioactive Material Response Procedure* (DOE-EM/GJRAC2160).

DOE (U.S. Department of Energy), *Moab UMTRA Project Health Physics Plan* (DOE-EM/GJ3003).

DOE (U.S. Department of Energy), *Moab UMTRA Project Hearing Protection and Conservation Procedure* (DOE-EM/GJ1617).

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Appendix A.
Acronyms and Abbreviations

Appendix A. Acronyms and Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ACM	asbestos-containing material
AL	action level
BLM	U.S. Bureau of Land Management
CA	Contamination Area
CFR	Code of Federal Regulations
COR	Contracting Officer's Representative
CRZ	Contamination Reduction Zone
dBA	decibels (8-hour time-weighted average)
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EMCBC	Office of Environmental Management Consolidated Business Center
EMR	Emergency Medical Responder
EMS	Emergency Medical Services
EPA	U.S. Environmental Protection Agency
ERO	emergency response organization
ESH&QA	Environmental, Safety, Health, and Quality Assurance
EZ	Exclusion Zone
FCD	DOE Federal Cleanup Director
FPD	Deputy Federal Project Director
GFCI	ground-fault circuit interrupters
H&S	Health and Safety
HASP	Health and Safety Plan
HazCom	hazard communication
HAZWOPER	Hazardous Waste Operations and Emergency Response
HS&T	Health, Safety, and Training
IDLH	immediately dangerous to life and health
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
IWP/JSA	Integrated Work Plan/Job Safety Analysis
MOU	memorandum of understanding
MVFPD	Moab Valley Fire Protection District
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
PEL	permissible exposure limit
PPE	personal protective equipment
RAC	Remedial Action Contract or Contractor
RBA	Radiological Buffer Area
RCM	Radiological Control Manager
RCRA	Resource Conservation and Recovery Act
RCT	Radiological Control Technician
RRM	residual radioactive material
RWP	radiological work permit
SDS	Safety Data Sheet
SZ	Support Zone

Appendix A. Acronyms and Abbreviations (*continued*)

TAC	Technical Assistance Contract or Contractor
TLV	threshold limit value
TWA	time-weighted average
UMTRA	Uranium Mill Tailings Remedial Action
UPRR	Union Pacific Rail Road
USC	United States Code