

Los Alamos Environmental Restoration
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environmental restoration project

January 2000
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A Department of Energy
Environmental Cleanup Program

Environmental Restoration Project Health and Safety Plan

Revision 2

Approved for use: signature on file Date: 1/25/00
Julie A. Canepa, ER Program Manager

27
Received by ER-RPF
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[Signature]

Los Alamos
NATIONAL LABORATORY
Los Alamos, New Mexico 87545

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ACRONYMS AND ABBREVIATIONS

ANSI	American National Standard Institute
CFR	Code of Federal Regulations
CPR	cardiopulmonary resuscitation
DOE	U.S. Department of Energy
DOELAP	DOE Laboratory Accreditation Program
ER	Environmental Restoration (and Decommissioning)
ESH	Environmental, Safety and Health
ESH-1	Health Physics Operations Group
ESH-4	Health Physics Measurement Group
ESH-5	Industrial Hygiene and Safety Group
ESH-12	Policy and Program Analysis Group
ESH-13	ESH Training Group
FAPL	focus area project leader
FMU	facility management unit
FTL	field team leader
FTM	field team manager
HASP	health and safety plan
HAZWOPER	hazardous waste operations and emergency response
HP	health physics
HPT	health protection technician
HS	radiological, health and safety
ICRP	International Commission on Radiation Protection
JS	job superintendent
LANL	Los Alamos National Laboratory
NCRP	National Commission on Radiation Protection
NIOSH	National Institute for Occupational Safety and Health
NUREG	Nuclear Regulatory commission Regulatory Guide
OSHA	Occupational safety and Health Administration
RadCon	radiation control
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RSAA	radiological surveillance authorization agreement
RSP	radiological screening personnel
RWP	radiological work permit
SHASP	site-specific health and safety plan
SSO	site safety officer

1.0 INTRODUCTION

This comprehensive health and safety plan (HASP) has been developed by the University of California (UC) for the Environmental Restoration (ER) Project at the Los Alamos National Laboratory (LANL) to comply with applicable federal and state occupational safety and health requirements, including those of the U.S. Department of Energy (DOE). This HASP establishes umbrella radiological, health and safety (HS) requirements and information applicable to ER Project field operations projectwide.

The DOE requires the LANL to comply with the federal Occupational Safety and Health Administration (OSHA) requirements. Accordingly, this HASP has been written to address hazardous waste operations and emergency response (HAZWOPER) and non-HAZWOPER activities.¹ In some cases, the UC has chosen to invoke OSHA and UC requirements that ordinarily may not apply to ER Project operations (e.g., the OSHA general industry standards in Part 1910 of Title 29 of the Code of Federal Regulations [29 CFR 1910]). These choices have been made on a case-by-case basis to maintain consistency with the UC's contract with the DOE, its policy to minimize hazard levels to as low as reasonably achievable (ALARA), and to clarify the UC's expectations with regard to interpretable requirements of the multiple agencies governing ER Project field operations.

The UC has developed and implemented radiation protection policies and procedures to comply with federal and DOE mandated regulatory requirements and consensus standards, including though not limited to: Occupational Radiation Protection (10 CFR 835), the DOE Radiation Control (RadCon) Manual, 10 CFR 834, applicable DOE orders and national standards (Section 4.0), NUREG, and DOE Implementation Guides. The LANL Radiation Protection Program and Laboratory Implementing Documents (e.g., Directors Policy for Radiation Protection [LANL DP107], LANL RadCon Manual, and other institutional and job-specific standards and procedures) have been developed by the UC to comply with applicable standards and requirements in a consistent manner and to provide guidance for conducting operations at the LANL in compliance with UC policies and procedures. These documents are incorporated into this HASP as supplements.

This HASP and model Site-Specific Health and Safety Plan templates (SSHASPs, short- and long-form versions) are available to ER Project participants in written and electronic forms. These documents are supplemented by the *ER Project Health and Safety Guidance Manual* (guidance for project HS planning and execution) and the *ER Project Health and Safety Oversight Implementation Plan*. This HASP is incorporated without the appendices into the ER Project Installation Workplan (IWP) as Appendix 6.

1.1 Scope and Applicability

The UC acknowledges that potential hazards are inherent to the performance of ER Project field operations conducted at the LANL. Accordingly, the UC expects that work conducted under contract to the UC will be performed in a safe and healthful manner that minimizes the threat and occurrence of hazards to health, property, and the environment to ALARA levels. ER Project participants are responsible for conducting work in accordance with applicable federal, state, and local regulations and DOE and UC requirements. The term "ER Project participants" refers to anyone performing ER Project work, including the UC, its subcontractors and their lower-tier contractors, consultants, and agents.

In addition to the umbrella information and requirements provided herein, a SSHASP shall be prepared for each field project. The Focus Area Project Leader (FAPL), who is the UC representative having authority and responsibility for SSHASP development and implementation, will delegate the responsibility for SSHASP preparation (Section 3.2.1.1). Each SSHASP supplements this HASP by providing additional HS information and requirements indicated by the operations and conditions at individual project sites.

¹ Guidance for determining applicability of OSHA and DOE requirements are provided in the *ER Project HS Guidance Manual*, the *DOE Handbook for Occupational Health and Safety During Hazardous Waste Activities*, and DOE Orders 5480.21, .22, and .23.

In the interest of protecting health and property (the LANL property and associated personnel, the local public and their interests, and the personnel and equipment involved in conducting ER Project work); programs, plans, and procedures associated with the performance of ER Project field projects are subject to approval by designated UC representatives prior to implementation, as discussed further in Section 1.2. However, such approval in no way relieves ER Project participants from compliance with regulatory requirements pertaining to HS programs, plans, procedures, or work practices; nor does such approval relieve ER Project participants from their responsibility to maintain a safe and healthful work environment. Subcontractors to the UC, and their lower-tier subcontractors, are solely responsible for the health and safety of their employees.

The Subcontractor shall comply with the HASP, any approved revisions to the HASP, the Subcontractor's programs, and any site-specific plans and procedures that have been approved by the UC in relation to the work. Both the HASP and completed SSHASP for each project shall be kept readily available for reference by individuals performing ER Project field operations. Where there is concern that implementation of work orders or HS requirements would conflict with contract terms, or could unreasonably compromise the safety or health of an individual or the environment, such concerns should immediately be brought to the attention of the Contract Administrator and the ER/HS Representative (defined in Section 3.3.2). All ER Project participants are authorized to immediately stop any ER Project activity that poses unreasonable risk to persons or the environment (Section 3.5).

Failure to comply with terms of HS plans may constitute cause for the UC to stop activity or for issuance of a stop work order (Section 3.5) without cost or penalty to the UC as delineated in the terms of each specific task or work order let under an ER Project contract. The Contract Administrator shall notify the Subcontractor in writing of any noncompliance with contract provisions. Meanwhile, it is the Subcontractor's duty to correct noncompliant condition(s) without delay, upon awareness that such condition(s) exist.

1.2 Review and Approval of Health and Safety Documents

DOE and OSHA have requirements that employers develop, implement, and maintain certain written documents as means for preventing or mitigating exposure to HS hazards in the workplace. The primary programs, plans, procedures, and permit systems required for conducting work at the LANL are discussed in this section.

Whenever subcontractors to the UC act as a prime contractor, by having lower-tier subcontractors perform work under contract to it, the Subcontractor is responsible for contracting subcontractors whose HS program documents are approved by the UC, or the lower-tier subcontractors' personnel must abide by the Subcontractor's HS program documents that have been approved by the UC. Lower-tier subcontractors' personnel also must abide by project-specific HS documents and site-specific permits discussed in this section that have been approved by the UC. Any variances from approved program or project-specific documents, or site-specific permits must be approved prior to implementation by an authorized representative of the affected parties, the FAPL and the ER/HS Representative.

1.2.1 General Programs, Plans, Procedures, and Permit Systems

Prior to a contract being awarded or a task or work order being let, as requested, prospective subcontractors to the UC shall submit their general written programs, plans, procedures, and permit systems (hereafter referred to in this section collectively as "program documents") listed in Appendix A to the Contract Administrator for review and approval by appropriate UC representatives. Only those program documents that are required by OSHA, DOE, and/or the UC and those that are applicable to performance of an ER Project contract must be submitted. Programs that are currently compliant and already approved by the UC need not be resubmitted. Where a subject has been addressed sufficiently in another of the employer's documents (e.g., respiratory protection within a HAZWOPER program), it need not be repeated elsewhere, although it should be cross referenced appropriately for users to follow. In some cases, indicated in Appendix A or Section 1.2.3, UC subcontractors will be required to use UC program documents.

1.2.2 Project-Specific Documents

Site-specific documents (plans, procedures, and permits), which are required by OSHA, DOE, and/or the UC, must be submitted to the ER/HS Representative for review and approval by appropriate UC personnel. Generally these submittals are to be made prior to the Subcontractor being given "Notice to Proceed" by the Contract Administrator. However, in cases where an unanticipated activity becomes necessary during the course of project execution, for which a project-specific document is required, the document(s) shall be submitted and approved similarly prior to starting the related field activity.

Specifically, before any field work is initiated, a completed SSHASP document shall be submitted to the ER/HS Representative, in draft form, for review and approval by UC representatives. Every final SSHASP must be signed by an authorized representative of each ER Project participant-employer having an employee subject to the terms of the SSHASP by reason of his/her performance of work at a covered site. Such signatures, which shall be affixed to the signature page, shall serve as certification that the employer(s) have reviewed, concur with and will conform their employees' conduct to requirements stated in the HASP and SSHASP. Every SSHASP must also be signed indicating approval or concurrence by an authorized representative of the LANL Facility Management Unit (FMU) where the operations will occur. A copy of the fully signed SSHASP shall be provided by the preparer to each signatory of the SSHASP.

Additionally, each individual, who will enter an area of a site where access has been limited in accordance with the SSHASP, shall sign an acknowledgment form (Appendix B) to acknowledge that s/he has read or been briefed on, and understands the contents of, the HASP, applicable SSHASP and any supplements, and agrees to abide by terms of these documents.

1.2.3 Site-Specific Permits

Site-specific permits (and job-specific procedures such as lockout/tagout of hazardous energy) that must be signed in acknowledgment or approval by the UC or its agent(s) prior to implementation are identified in this section. Unless indicated otherwise in writing by the Contract Administrator, the Subcontractor shall initiate action (through the FAPL) to obtain the UC's acknowledgment and/or approval of its permits before the anticipated date of any permit implementation. Such action may include a requirement that the Subcontractor submit project-specific standard operating procedures (SOPs). As the host organization, the UC will provide the Subcontractor with preliminary hazard assessment information necessary for permit preparation. The Subcontractor, in turn, must provide the UC with a copy of the Subcontractor's terminated permit.

The following permits and/or procedures apply as necessary to ER Project field operations:

- **Confined Space Entry** - Compliance with 29 CFR 1910.146.
- **Excavation** - ER participants are required to apply for a LANL Excavation Permit for any excavating (ground breaking) or trenching operation. Any such operations that will penetrate subsurface soil by greater than 1-foot in depth will also require completion of the ESH review process.
- **Lockout/Tagout of Hazardous Energy Sources** - As required by 29 CFR 1910.147 a written procedure to be prepared prior to starting any such activity.
- **Radiological Work Permits** - As required by ER/ESH-1 and the LANL RadCon Manual.
- **Spark/Flame-Producing Operations (Hot Work/Burn Permit)** - ER Project participants must comply with the LANL requirements for a Special Work Permit for Spark/Flame-Producing Operations.
- **Special Work Permits** - Special permits as required by the FMU(s) where site operations will occur.

1.3 Updating Health and Safety Documents

Evolutionary changes in HS information or requirements that apply projectwide will be incorporated in updates of this HASP. During the interim, the most current UC approved requirements indicated in the contract terms apply. Any exceptions or deviations from the HASP must be described in writing (e.g., in the applicable program, project-specific document, or site-specific permit or record) together with the associated rationale(s).

The Subcontractor is expected to maintain and implement its programs as they apply to the work being performed at the LANL. Programs are to be updated as necessary for compliance as regulations or UC requirements change. Unless indicated otherwise in writing, newly required program documents and updates are to be submitted to the Contract Administrator at least 30 days before the scheduled start date of an operation for which a written program is required, for review and approval by appropriate UC personnel.

SSHASPs are to be revised as necessary to include new information and changes that keep the SSHASP current. Deviations from an approved SSHASP must be approved by the FAPL and ER/HS Representative prior to implementation. They also must be documented in some form (e.g., a field logbook, SSHASP Modification Form, or memo to the project file). Generally, revisions of an approved SSHASP are to be made using a SSHASP Modification Form (Appendix C). SSHASP Modification Forms are to be signed by a duly authorized representative of each party affected by the modification(s) having authority to approve or concur with the terms of the modification(s), including the FMU[s], subcontractors, and lower-tier subcontractors, consultants or agents. Any changes to an approved SSHASP are to be communicated to affected individuals prior to implementation.

Modifications to a SSHASP may require a change to the terms or scope of a subcontract. Completion of a SSHASP Modification Form is not the means for modifying the scope or terms of the project contract. To modify a contract, the Subcontractor shall notify the Contract Administrator under the changes clause and shall not proceed with the change until a change order has been mutually agreed between the parties, or unless unilateral direction is given by the Contract Administrator.

When a draft SSHASP is submitted for UC review, ESH-S will issue a unique document control number, which shall appear on the title page and in the footer of each page of the final document. Each modification form should be consecutively numbered using the SSHASP number (X), followed by a decimal point and a numeric suffix (e.g., X.01 or X.02) indicating the modification number sequentially.

2.0 BACKGROUND INFORMATION

Background information specific to the project is to be provided in the SSHASP, including the project scope of work and relevant history and descriptions of the project site(s). Guidance for this is provided in the *ER Project HS Guidance Manual*.

To address the HAZWOPER requirement of 29 CFR 1926.65(l)(3)(i)(A), this section provides general information about the location and climate of Los Alamos that is applicable to conduct of all ER Project field operations. This information was provided by the LANL Environmental Management Air Quality and Meteorology Section (Bowen).

2.1 Location

LANL and the communities of Los Alamos and White Rock are located in the County of Los Alamos in north-central New Mexico. The population of Los Alamos County according to the 1990 U.S. Census was 18,115 (University of New Mexico). By air LANL is located approximately 60 miles north-northeast of the City of Albuquerque and 25 miles northwest of the City of Santa Fe. Much of Los Alamos is located on the Pajarito Plateau on the eastern flanks of the Jemez Mountains. The plateau slopes downward to the east-

southeast, covering a distance of more than 15 miles from the base of the Jemez Mountains (approximately 7,800 feet above sea level [ASL]) to a location just above the Rio Grande River Valley (approximately 6,200 feet ASL). Numerous alternating "finger" mesas and canyons run along the plateau slope line. The canyons are 150 to 300 feet deep and 300 to 600 feet wide. The Sangre de Cristo Mountains lie nearly 40 miles to the east. The Rio Grande Valley runs north-northeast to south-southwest between the two mountain ranges.

2.2 Prevailing Weather Conditions

Los Alamos has a semiarid, temperate mountain climate that is characterized by the prevailing weather conditions described in the *ER Project HS Guidance Manual*.

3.0 COMMUNICATIONS, ORGANIZATION, RESPONSIBILITY, AND AUTHORITY

The purpose of this section is to clarify the roles, responsibilities, and authority of individuals as they relate to HS and to describe the organizational structure and lines of communications that are necessary to achieve the ER Project safety objectives. This section complies with the LANL Integrated Safety Management System (ISM) System, the Price Anderson Act Amendments, and OSHA HAZWOPER requirements.

Defining HS communications, responsibilities and authority for the ER Project is complicated by the matrix structure of the organization and the involvement of multiple subcontractor organizations. Over time, effective HS structure and communications methods have evolved that are described in this section. There are some fundamental concepts that help one understand the basis for the HS structure and communications.

Line Organization and Management – A basic premise of ISM is that line management is responsible for safety. The ER Project abides by this concept. However, because individuals from many different line organizations (re LANL Divisions) are matrixed to the ER Project, it is common practice for the ER Project to work out memorandums of understanding (MOUs) or similar agreements so that individuals from other line organizations always know and understand their safety chain of command.

Programmatic Organization and Management – There are many HS issues inherent with environmental restoration that must be addressed at the program level. Decisions are made that protect all workers in the ER Project, regardless of employer. These decisions and policies are described in program HS requirement documents such as this HASP. It is the responsibility of the line organizations to implement HS and meet the programmatic requirements.

Facility Management Organization and Management – The ER Project performs work in many Facility Management Units (FMUs) across the Laboratory. The ER Project must comply with the HS requirements of those FMUs. To facilitate compliance, the ER Project and FMUs agree on formal "work packages." The FMU HS requirements, defined in the work package, are then incorporated into SSHASPs prepared for work specifically in that FMU.

Subcontractor Organization and Management – There are several subcontractors that perform work as part of the ER Project Team. As private employers, they are obliged (legally, contractually, and morally) to maintain their own HS programs and line management structure. Subcontractors integrate the ER Project programmatic HS requirements into their HS programs as necessary while still maintaining a degree of HS autonomy. Subcontractors prepare SSHASPs for each field project. In the SSHASPs, lines of communication are defined that link subcontractors to LANL/ER Project line organizations. SSHASPs are reviewed and approved by LANL personnel. This mechanism, along with LANL field oversight, helps ensure that appropriate programmatic and line safety are integrated into work performed by subcontractors.

Most importantly, HS roles, responsibilities, authority and communications are worked out during the planning stages of every field project. The SSHASPs provide detailed information, ensuring that the ER Project integrates safety in the field, where there are the greatest potential hazards.

3.1 Communication

HS issues must be communicated quickly and effectively to protect affected ER Project team members and nearby personnel. To meet this requirement, several communications processes will be implemented. These processes may be adjusted as necessary to best meet the needs of each field project and must be accurately described in each SSHASP.

3.1.1 Pre-Field Communication

HS communications start before a person joins the ER Project. Managers and supervisors will communicate the importance of HS during the interview process. It is a requirement that all candidates comprehend the issues, understand the importance, and accept the responsibility to work according to the HASP and SSHASPs. HS communications continue during the training of personnel for the Project. This includes general and LANL specific HS requirements and a pre-job start HS briefing. See Section 10 for more details.

3.1.2 Field Communication

Routine communications processes are employed as long as field activities are progressing as planned and conditions are consistent with those anticipated and addressed in the SSHASP. Each morning, a tailgate safety meeting will be held (see Section 10.1.2). Attendance is mandatory for all project team members onsite. The Team Leader/Task Leader and/or Site Safety Officer (SSO) or their designee will conduct the meetings. During these meetings, the work plan for the day will be discussed and specific task hazard analyses reviewed. Feedback from team members will be actively solicited and incorporated into hazard control measures. Periodically, special emphasis topics may be included in the meeting. These are 5-10 minute refresher sessions covering HS topics that are relevant to the work being conducted. Additional tailgate safety meetings may be held at the discretion of the Team Leader/Task Leader or SSO.

When field conditions change, added communication is required. The Team Leader/Task Leader or their designee is responsible for communicating the changes to all field team members, the responsible FAPL, the FMU representative, subcontractor management, Project support personnel (e.g. ESH-1) and other ER Project managers, as appropriate. Changing conditions often require a temporary "stop activity" until all HS hazards can be adequately identified and controlled (see Section 3.5). This may require an ad hoc safety planning meeting and immediate telephone calls or radio communications. If unanticipated tasks must be performed, a task hazard assessment must be performed (see Section 4.1) and the resulting information communicated to all affected personnel. If the changing condition involves more or different radiological contamination than planned, the Team Leader/Task Leader may need to communicate with the ESH-1 Radiological Control Technician (RCT) Pool Supervisor to arrange for adequate RCT support.

3.1.3 Post-Field Communication

At the conclusion of field activities, the Team Leader/Task Leader and SSO should analyze the effectiveness of the HS program. If appropriate, feedback should be provided to Project management, the ESH-1 Group Leader, the ESH-1 RCT Pool Supervisor, the ESH-5 Group Leader, the ESH-5 representative, the FMU representative, the ER/HS representative and the ER Project lessons learned coordinator. Suggested changes should be incorporated for continuous improvement. This is particularly relevant when there have been HS problems or when things have gone exceptionally well.

3.2 Site Visitor Policy

A visitor (e.g., regulatory personnel, private property owners, field auditors, or the public) is anyone who arrives at the work site who is not identified in the project specific documents as a project team member or associated support personnel. When a visitor arrives, the Team Leader/Task Leader or their designee must meet with the visitor to determine the purpose of the visit and to provide a safety briefing. This briefing shall include at a minimum a description of known and anticipated hazards and the applicable controls, site emergency response procedures and site escort requirements.

Visitors shall not be permitted to enter limited-access, controlled work zones unless absolutely necessary. In such cases, the visitor shall be briefed per Section 10.1.1, shall meet all applicable requirements of the HASP and SSHASP, and may need to be accompanied by an escort at the discretion of the Team Leader/Task Leader. If a visitor does not comply with these requirements, the Team Leader/Task Leader, or their designee, shall request the visitor to leave the controlled zone immediately or shall limit site operations to minimize threat of harm to the visitor (e.g., have the project team take a break, reset the zone boundaries if appropriate, or temporarily discontinue any threatening task). Alternatively, if a visitor needs to observe work being performed in a controlled zone which is not readily visible from outside the zone(s), consider videotaping or photographing the work, if allowed by security.

3.3 Organization, Responsibility, and Authority

This section describes the organizational structure, responsibility, and authority of personnel as they relate to HS. Specific individuals fulfilling these roles are identified in each SSHASP.

3.3.1 Managers

3.3.1.1 Program Manager

The Program Manager is a LANL employee who is ultimately responsible for the safety of people working on the ER Project. His/Her responsibilities include:

- Making HS policy decisions;
- Ensuring that adequate HS resources are available to meet HS objectives;
- Resolving conflicts between HS and production that cannot be resolved at a lower level;
- Ensuring that FAPLs and other ER Project Managers comply with HS programmatic requirements;
- Performing safety walk-around surveys;
- Supporting and promoting LANL As Low As Reasonably Achievable (ALARA) policies and principles;
- Ensuring that ALARA program requirements are met; and,
- Exercising programmatic and line safety management authority as required.

3.3.1.2 Focus Area Project Leader

The FAPL is a UC employee who reports to the ER Program Manager. The FAPL may direct one or more Team Leaders and Task Leaders. His/her HS responsibilities include:

- Exercising programmatic and line safety management authority as required;
- Ensuring that the necessary SSHASPs for his/her project unit are developed and that the comments of appropriate reviewers have been incorporated;
- Ensuring that the HASP and SSHASPs are implemented for field operations under his/her control;

- Delegating HS responsibility as necessary to maintain a clear chain of command for HS issues;
- Ensuring there is always a designated onsite supervisor;
- Ensuring that appropriate communications with FMUs have occurred;
- Ensuring that personnel performing work under his/her management meet HS qualifications;
- Communicating anticipated RCT support needs to the ESH-1 Group Leader and RCT Pool Supervisor, based on current plans;
- Resolving HS issues concerning his/her project;
- Prohibiting personnel who do not comply with HS requirements from working on field projects under his/her control;
- Conducting required inspections (Section 12.1); and
- Ensuring the submittal of appropriate field project HS records to the LANL Records-Processing Facility (RPF, Section 13).

3.3.1.3 Team Leader

The Team Leader (usually a LANL employee for Field Projects) may manage one or more field projects. He/she has the flexibility to assume a direct role in management of the fieldwork or may delegate that responsibility to one or more Task Leaders or subcontractor supervisor/project managers. His/her HS responsibilities include:

- Exercising line management safety authority as required;
- Delegating HS responsibility as necessary to maintain a clear chain of command for HS issues;
- Ensuring there is always a designated onsite supervisor;
- Ensuring that all known tasks, associated hazards, and control measures have been identified.
- Ensuring that provisions of the SSHASP are implemented for his/her projects;
- Ensuring that each concerned party has reviewed the SSHASP for accuracy and adequacy (per Section 1.2); also ensuring that review comments are resolved and that the SSHASP is signed before any field activities are begun;
- Ensuring that only qualified project team members and support personnel perform ER Project work;
- Initiating work authorizations with ESH-1 for RCT support of field activities.
- Communicating changes in fieldwork schedules with the RCT Pool Supervisor so that adequate RCT support is available.
- Ensuring that all field team members receive daily safety briefings.
- Ensuring that all required permits have been obtained.
- Ensuring that emergency response planning and training has been completed prior to beginning field operations.
- In the event of an incident or emergency, functions as site incident/emergency coordinator; as necessary, arranges for immediate notification of LANL emergency response personnel to take control of the scene and/or arranges for immediate notification of appropriate authorities (Section 9).
- Conducting necessary inspections (Section 12.1);
- Ensuring that necessary field logs and HS records are produced and kept; and
- Providing necessary HS records to the FAPL at the close of the project (Section 13).

3.3.1.4 Task Leader

Through delegation, a Task Leader may assume some or all of the HS responsibilities and authority afforded the Team leader. When this occurs, it must be authorized by the FAPL and clearly described in the SSHASP. The purpose of such delegation is to maintain a clear HS chain of command in the field.

3.3.1.5 Subcontractor Supervisors/Project Managers

A subcontractor Supervisor/Project Manager is responsible for ensuring that employees under his/her supervision comply with the HASP and SSHASP. They are responsible for ensuring the full cooperation of their organization with LANL and other subcontractors to achieve HS objectives. In addition, the subcontractor Supervisor/Project Manager must exercise line management safety authority for personnel working for that company. When multiple subcontractors are on a site, each subcontractor must designate an onsite supervisor who has line management safety authority.

Through delegation, subcontractor Supervisors/Project Managers may assume some HS responsibilities and authority afforded the Team Leader. When this occurs, it must be authorized by the FAPL and clearly described in the SSHASP. The purpose of such delegation is to maintain a clear HS chain of command in the field.

Subcontractors to UC (second tier subcontractors) that engage their own subcontractors (third tier subcontractors) are responsible for ensuring that their subs comply with all programmatic and site-specific HS requirements. For projects where multiple second tier subcontractors are working in the field together, ultimate onsite authority resides with the UC Team Leader or his/her designee.

3.3.2 Project Field Team Members

Project field team members may be part of the ER Project organization, other LANL Divisions, LANL support organizations or subcontractor organizations. Ultimately, field team members are responsible for conducting work in a safe manner and have the authority to stop work when unsafe conditions exist. They are responsible for abiding by requirements of the HASP, SSHASP, any supplements or modifications, and other applicable HS regulations and procedures, and for fulfilling and maintaining their individual training and medical surveillance requirements. If there is concern that implementation of work orders or HS requirements would unreasonably compromise the safety or health of an individual or the environment, such a concern should be brought to the attention of their line supervisor, the SSO, or Team Leader/Task Leader. When line managers in the field do not resolve an HS concern adequately, the matter shall be brought to the attention of higher line managers or the ER/HS Representative, as necessary. If adequate resolution still has not been achieved, team members are encouraged to call the LANL ESH hotline at 665-5010 or to contact the Los Alamos DOE Area Office at 667-5105 where they may file a complaint (DOE F 5480.4). The DOE has a policy that employees who report an HS problem are protected from reprisal.

3.3.3 HS Personnel

3.3.3.1 Site Safety Officer

OSHA requires that a site safety and health supervisor (a.k.a. SSO) be designated and that this person shall have the responsibility and authority to develop and implement the site safety and health plan and verify compliance. The SSO may perform other duties on the project team, provided that these duties do not compromise performance of his/her SSO duties. On a project-specific basis, the SSO shall be qualified to recognize and evaluate hazards and to minimize and mitigate occupational HS hazards. Guidance criteria for determining SSO qualifications are provided in the *ER Project HS Guidance Manual*.

The FAPL and/or Team Leader shall determine if a dedicated SSO is necessary for non-HAZWOPER projects. If a full-time SSO is not required, applicable duties of an SSO are to be assigned to other qualified personnel who will be onsite.

On projects with multiple subcontractors, there will be more than one person with site safety responsibilities. It is the Team Leader's responsibility to see that the safety chain of command is clearly defined and documented and that safety coverage is comprehensive.

The specific responsibilities of the SSO are to:

- Assist with and/or develop the SSHASP;
- Verify that onsite personnel have current certification of the applicable training and medical surveillance requirements;
- Help the Team Leader/Task Leader implement the HASP and SSHASP in compliance with applicable federal, state, and local HS regulatory requirements;
- Perform and document HS inspections of site operations (Section 12.1);
- Notify the Team Leader/Task Leader of any onsite personnel who are not abiding by applicable HS requirements and of potential or actual hazardous situations needing to be rectified;
- Notify the FAPL and the ER/HS Representative, when elements of the HASP and SSHASP are not being met and when HS hazards are not being minimized or mitigated sufficiently;
- Watch for changes in site operations and conditions that warrant hazard mitigation and/or modifications to project HS plans, procedures, permits, etc.;
- Ensure that copies of the HASP, SSHASP, supplements, and any modifications are current and that these documents are readily accessible onsite and as needed for ER Project work occurring elsewhere;
- Assess the necessity and arrange for monitoring of employee exposures to HS hazards and convey results and known implications to the Team Leader/Task Leader;
- Inform the Team Leader/Task Leader, the ER/HS Representative, and affected subcontractor supervisors/project managers of results of employee exposure monitoring (Section 13.3);
- Monitor levels and effectiveness of personal protective equipment (PPE) and verify proper use, storage and maintenance of equipment; and,
- Maintain HS-related field project records, including a daily log of HS-related matters concerning site operations, and provide these records to the Team Leader/Task Leader as necessary before close-out of the project.

3.3.3.2 Industrial Hygiene Technician

The industrial hygiene technician is a designated team member who is capable of monitoring employee exposures to hazardous substances; and, to the extent necessary for the site-specific work, is capable of evaluating exposure monitoring results to determine actions necessary to protect individuals onsite. This person may be someone who is training to become an SSO, and, with approval of the Team Leader/Task Leader, someone to whom the SSO may delegate his/her responsibilities as this person is trained and qualified to perform such duties.

3.3.3.3 Trenching/Excavation Competent Person

This individual is a designated team member or support person, in accordance with 29 CFR 1910.146, who is capable of identifying existing and predictable hazards in the surroundings or working conditions involved in trenching or excavation that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them (29 CFR 1926.650 [b]). This person shall have had specific training in and be knowledgeable about soils analysis, the use of protective systems, and the requirements of 29 CFR 1926 Subpart P - Excavations (29 CFR 1926.650 *et seq*).

3.3.3.4 Registered Professional Engineer

A registered professional engineer is a person who is registered as a professional engineer in the state where the excavation or trenching work is to be performed (29 CFR 1926.650 [b]).

3.3.3.5 Confined-Space Entry Supervisor

The confined-space entry supervisor is a designated team member or support person who is responsible for determining whether acceptable entry conditions exist at a confined-space where entry is planned, for authorizing and overseeing entry operations, and for terminating entry in accordance with regulatory and permit requirements (29 CFR 1910.146 [b]).

3.3.3.6 Other Competent or Qualified HS Personnel

Throughout 29 CFR 1926, and applicable standards of 29 CFR 1910 evoked by the UC, OSHA uses the terms "competent" and "qualified" to denote specially trained and knowledgeable individuals who are required to perform certain job functions. These specific standards are cited as applicable throughout the HASP and SSHASP. Wherever requirements exist in these standards for participation of a competent or qualified person, the person shall be trained and knowledgeable of the particular regulated subject matter in accordance with 29 CFR 1926.32(f) or (m), the applicable regulatory standard, and Section 10.

3.3.4 Health Physics Personnel

Health physics personnel include radiological screening personnel (RSPs), Health Protection Technicians (HPTs), and Radiological Control Technicians (RCTs). ESH-1 provides HPTs and RCTs to the ER Project through the RCT Pool. These personnel are the only ones allowed to perform tasks required for compliance with 10 CFR 835, (e.g. performing a survey for unconditional release of equipment from a field site). RCTs also perform oversight of work performed by RSPs. RSPs are contractor personnel who have a Radiological Surveillance Authorization Agreement (RSAA) with ESH-1. Typically, these agreements allow authorized individuals to perform limited radiological control tasks related to ER field projects. See procedure ESH-1-01-03.2 "Radiological Surveillance Authorization Agreement" July 1, 1999 (or current version) for details of the RSAA.

All health physics personnel working on ER field projects, regardless of employer, are responsible for immediately reporting radiological issues and concerns to the Team Leader/Task Leader. If field supervision has been delegated to a subcontractor supervisor/project manager, then radiological issues must also be reported to the subcontractor supervisor/project manager and the Team Leader/Task Leader. It is essential that radiological concerns be reported up through the UC chain of command.

3.3.4.1 Radiological Screening Personnel (Non ESH-1 Personnel)

RSPs are responsible for providing health physics monitoring support for the project team. Each RSP is responsible for performing health physics monitoring support in accordance with his/her RSAA. Specific responsibilities include

- Maintaining a current and valid RSAA;
- Performing radiological control work within the scope of their RSAA;
- Performing and documenting housekeeping radiological surveys;
- Performing conditional equipment surveys;
- Performing daily instrument response checks;
- Ensuring that all radiation-monitoring equipment is in good working order;
- Ensuring that radiological postings are maintained;

- Immediately notifying the Team Leader/Task Leader, SSO, and ESH-1 when any contamination occurs to skin or any personal clothing;
- Reporting radiological concerns to the SSO, Team Leader/Task Leader, and ESH-1;
- Providing the RCT Pool Supervisor with a daily verbal summary of site radiological conditions and copies of all radiological survey documentation;
- Notifying the Team Leader/Task Leader and SSO when action levels defined in the SSHASP have been reached

3.3.4.2 Health Protection Technician and Radiological Control Technician (ESH-1 Personnel)

In addition to the responsibilities of the RSP, the responsibilities of the HPT and the RCT include

- Preparing, ensuring compliance with, and closing out radiological work permits (RWPs);
- Revising the site RWP when the radiological controls required do not provide adequate worker protection or contamination control;
- Providing guidance on radiological decontamination of equipment and personnel;
- Performing "unconditional release" surveys for equipment (RCTs ONLY);
- Providing regulatory compliance guidance to the Team Leader/Task Leader when field conditions change and radiological issues emerge; and,
- Reporting radiological concerns to the Team Leader/Task Leader and to the RCT Pool Supervisor.

3.4 Project Support Personnel

3.4.1 Subcontractor Representative

A Subcontractor representative is a management or HS professional representing an employer affected by terms of the SSHASP. This individual must have the authority to approve the terms of the SSHASP and any modifications and to see that employees of his/her employer abide by these terms. Additional responsibilities include

- Interfacing with project line managers, other employers' supervisory personnel, and support professionals, as necessary, to coordinate implementation of HASP, SSHASP and other applicable HS requirements; and
- Assisting with resolving HS issues involving his/her employees performing ER Project work, particularly those involving discrepancies between policies of multiple employers represented onsite and site-specific HS requirements.

3.4.2 ER/HS Representative

The ER/HS Representative may be either a UC or contract employee, or subcontractor who is assigned to the FAPL(s) as a technical advisor. This person provides HS support to personnel performing ER Project work involving his/her assigned project unit(s). He or she serves as liaison between the project unit personnel, ESH Division personnel, and FMU HS personnel. This person can arrange for provision of technical assistance by UC personnel concerning industrial hygiene, operational safety, and health physics matters. S/He may also be responsible on behalf of the LANL for implementing the *ER Project HS Oversight Implementation Plan* (Section 12.2) for project unit(s) as assigned by ER Project HS management. In addition to the responsibilities of the Subcontractor Representative, the ER/HS Representative has responsibilities that include

- Ensuring that SSHASPs for his/her project unit(s) are reviewed by appropriate parties;

- Verifying that known hazards, preventive measures, and mitigation controls associated with the project scope of work and tasks have been adequately incorporated in the SSHASP;
- Reviewing and approving SSHASPs, supplements, and modifications for ER Project work at his/her assigned project sites; and
- Verifying that field operations associated with his/her project unit(s) are conducted in accordance with applicable HS programs, plans, and regulatory requirements.

3.4.3 ESH-1 RCT Pool Supervisor

The ESH-1 RCT Pool Supervisor will be the point of contact for obtaining radiological control support and oversight (see Section 12.2) for ER fieldwork. The Pool Supervisor will be provided with an anticipated field schedule based on current plans of the ER Project. The Team Leader/Task Leader or his/her delegate will communicate anticipated radiological support needs, based on the baseline, to the Pool Supervisor so he may schedule the resources. It is the responsibility of the Team Leader/Task Leader to communicate deviations from the baseline and changing support needs to the Pool Supervisor at the earliest possible time. The responsibilities of the RCT Pool Supervisor include:

- Schedule RCTs to support ER field work;
- Update scheduled support needs based on feedback from the Team Leader/Task Leader;
- Enter into work authorizations with the ER Project for personnel assigned to support the ER Project;
- Reviewing HS documents as necessary;
- Work with the Team Leader/Task Leader to resolve scheduling/resource conflicts;
- Exercising line management safety authority as required;
- Providing regulatory compliance guidance to the Team Leader/Task Leader when field conditions change and radiological issues emerge;
- Serving as a conduit for feedback from RCTs to ER Project management; and,
- Reporting radiological issues and concerns to ER Project management, not otherwise reported by RCTs.

3.5 Facility Management Unit (FMU) Representative(s)

FMU representatives include personnel of the FMU where ER Project activity will occur. The top representative is the Facility Manager (FM). The FM may also be supported by an alternate, building managers and their alternates, and personnel responsible for facility-specific environment, safety and health (ESH). With respect to ER Project activities occurring at facilities throughout the LANL, the FM, or his/her delegate, is responsible to

- Establish written facility manager-tenant agreements to communicate a mutual understanding of safety interface, requirements, roles, responsibilities, and authorities by FM and facility occupants;
- Authorize all facility-related work within the affected FMU boundary, including review and approve or concur with ER Project SSHASPs and supplemental plans, permits and procedures;
- Determine required procedures for consistent application in the facility to stay within facility operating limits;
- Periodically review and monitor operations occurring within the FMU boundary; and
- Correct or shut down operations or activities that violate the facility-tenant agreement or that compromise safety.

3.6 Stop-Activity and Stop-Work Orders

There are occasions when it is necessary to discontinue an activity onsite or an entire field project because the conditions of operation are unsafe and must be reassessed to determine the appropriate means and/or methods for continuing work safely. The FAPL and the ER/HS Representative are to be notified by the Team Leader/Task Leader of any stop-activity or stop-work and the actions already taken or proposed to rectify the hazardous situation.

Any individual observing an operation that presents a clear and imminent danger to the environment or to the HS of site personnel, visitors, or the public is obligated and has the authority to immediately notify the individuals involved and the Team Leader/Task Leader or SSO. In turn, the Team Leader/Task Leader or SSO shall verbally notify supervisors and individuals on the site of the danger. Once it has been concluded that conditions or practices exist that pose a threat to personnel or environmental safety or health, the Team Leader/Task Leader shall take action to diminish the immediate threat of harm. Operations shall be altered or discontinued to eliminate the immediate threat of harm, and individuals shall be directed to immediately leave an area of imminent danger. In situations involving radiological hazards, RCTs have the responsibility and authority to stop work or to mitigate the effect of an activity if they suspect that the initiation or continued performance of the activity will result in a violation of radiological control standards or result in imminent danger or unacceptable risk (LANL Radiation Protection Program).

A stop-activity might involve a situation such as removing defective equipment that could result in an injury or illness or removing site personnel from a section of scaffolding that is defective. In which case, the activity may be stopped without stopping the entire field operation. Authorization to begin an activity again shall be given by the Team Leader/Task Leader only when it has been determined that the hazard(s) has/have been sufficiently abated, there is no further threat of harm, the FAPL and ER/HS Representative have concurred, and affected personnel have been notified of the intent to restart.

In situations where the activity or work stoppage has contractual implications, the Contract Administrator must be involved in the assessment and decision to issue a stop-work order. A formal ("contractual") stop-work order can be issued only by a LANL Contract Administrator. Experts from ESH Division may provide recommendations regarding the need to issue a stop-work order by notifying the FAPL and Team Leader/Task Leader. The FAPL or the ER/HS Representative will contact the Contract Administrator to arrange for review of the matter, and will proceed in accordance with applicable LANL procedures. Only a LANL Contract Administrator can authorize the restarting of work after a stop-work order.

4.0 HAZARD ANALYSIS

In compliance with DOE and OSHA requirements, a hazard analysis shall be prepared for each task (activity) to be performed during an ER project prior to conducting the task.^{2,3} Each hazard analysis shall be site-specific and have two essential components: (1) identification and assessment of the hazards associated with performing each task at each site, and (2) determination of the necessary and sufficient controls for preventing or mitigating the anticipated hazards and adequately protecting affected personnel.

² DOE "Handbook for Occupational Health and Safety During Hazardous Waste Activities" and the "Health and Safety Plan (HASP) Guidelines"; DOL, 29 CFR 1910.132(d); DOL, 29 CFR 1926.65(b)(4)(ii)(A); and/or DOL 29 CFR 1926 or 1910 Subpart Z substance-specific standards.

³ For purposes of this document, the term "hazard analysis" is inclusive of the OSHA terminology used and processes inferred by the terms "hazard assessment" and "exposure assessment". It also includes the determination and assignment of preventive and protective control measures corresponding to the assessed hazards.

For each task to be performed at each project site, the hazards shall be identified and assessed by a qualified person to determine the associated qualitative probability of occurrence and the severity of injury/illness expected to result. The assessment shall address the site- and task-specific hazards that could result from the unpredictable detonation of high explosives and/or exposure to radiological, safety, biological, physical, and chemical hazards. Based on the hazard assessment ratings (HARs), the corresponding protective and control measures are to be determined. The site- and task-specific hazard assessments and controls are to be incorporated into each SSHASP. Further definition and guidance for hazard analysis are provided in Section 4.0 of the *ER Project HS Guidance Manual*.

This HASP, a SSHASP (including a hazard analysis), and any necessary supplements will generally suffice as plans for controlling hazards in terms of worker health and safety. However, ER Project activities at nuclear, nonnuclear, and radiological facilities may involve significant hazards to the public as well as workers, and require that additional planning and analysis considerations be carefully integrated throughout the work planning process. The DOE and the UC have agreed that several DOE Orders and American National Standard Institute (ANSI) standards pertaining to nuclear facilities and nuclear criticality control, among others, are applicable at the LANL (DOE-UC Contract, Appendix G). These requirements and guidance for determining their applicability are provided in the *ER Project HS Guidance Manual*, the *DOE Handbook for Occupational Health and Safety During Hazardous Waste Activities*, and DOE Orders 5480.21, .22, and .23.

4.1 Hazard Assessment

Hazard assessment involves identifying the hazards associated with performance of a task, assessing the probability of occurrence and the severity of injury/illness expected to result, and rating the hazard. Each task hazard assessment must also include an assessment on a site-specific basis. This is because ER Project field work involves performing tasks, oftentimes the same generic tasks, at various sites that can have extremely different conditions and site-related hazard potentials.

The UC has provided a method for evaluating and rating hazards, which is included in the *ER Project HS Guidance Manual*. A list of several assessment methods are provided by the DOE (DOE, *Health and Safety Plan [HASP] Guidelines*). The hazard assessment, method and rationale(s) for the resulting assessment(s) are to be clearly indicated in each SSHASP.

4.2 Administrative and Engineering Controls

As a first line of defense, DOE and OSHA (DOE, *Health and Safety Plan [HASP] Guidelines*; DOI, 29 CFR 1910.100[e]) require that employers implement administrative and/or engineering controls to prevent and/or mitigate hazards and protect site personnel. Secondly, employers may require employees to use personal protective equipment (Section 7). This section addresses the basic administrative and engineering control requirements with which ER Project participants are required to comply. Site-specific administrative and engineering requirements corresponding to the task-specific hazard assessments (Section 4.1) shall be included in the SSHASP.

4.2.1 General Administrative Controls

The general work practices and administrative controls in this section are to be implemented as applicable during ER Project field operations.

4.2.1.1 Drug and Alcohol Policy

- Personnel who are taking medications that may diminish their ability to perform their duties in a safe and healthful manner (e.g., medication that causes drowsiness or affects mental alertness or coordination), are encouraged to inform the FTL or JS, SSO, or qualified HS professional, so that alternate job duties may be assigned until the employee is no longer affected by the medication.

- Personnel who arrive at the field site intoxicated are not allowed to perform their job duties. The FTL or JS, SSO, or qualified HS professional should be notified of such an event so that the person's supervisor may be notified and appropriate disciplinary action may be taken by the person's employer.

4.2.1.2 Housekeeping and Sanitation

- An adequate supply of potable water shall be provided in labeled container(s) that are equipped with a tap and capable of being tightly closed. Nonpotable water outlets shall be identified to indicate that the water is unsafe for drinking, washing, or cooking.
- No food, beverage, gum, cosmetic, or tobacco products shall be present, consumed, or used in any region of a work zone where contamination is suspected.
- Site personnel should be alert for dangerous situations, unusual odors, airborne dusts or vapors, and broken containers, and should report any potentially dangerous situations to his/her onsite line manager or the SSO immediately.

4.2.1.3 Site Control Measures

Site personnel shall implement the following site control measures, as applicable:

- Eliminate hazards to the extent possible before actual field work at the site begins (e.g., removing unnecessary debris, guarding exposed electrical wiring or protruding objects, and appropriately securing combustible materials and objects situated on elevated surfaces).
- Minimize contact with material that is or may be contaminated. As practical, avoid or minimize exposure to contamination and work upwind of intrusive activities.
- Minimize dust generation.
- Plan and review procedures before entering controlled work zones.
- Minimize the number of personnel and amount of equipment in the controlled work zones.
- Sign the exclusion entry/exit log upon entry to and exit from the exclusion zone (EZ) or contamination reduction zone (CRZ) - wherever access is controlled.
- Remain in line-of-sight or direct communication with a "buddy" at all times, to the extent possible, while performing duties in a controlled work zone. Use the "buddy system" in general, so that rapid assistance can be provided in the event of an emergency.
- Maintain appropriate fire extinguishers readily available for use whenever the potential for fire hazard exists. Inspect that extinguishers are fully charged at least monthly and comply with 29 CFR 1926.150 for annual inspections.
- Properly store flammable and combustible materials (29 CFR 1926 Subpart F). Keep ignition sources ≥50-ft from explosive or flammable environments and ≥35-ft from combustible liquids; use nonsparking, explosion-proof equipment in the EZ when the potential for a flammable or explosive environment exists.
- Use means and methods for refueling vehicles and equipment that comply with 29 CFR 1926.152(e).
- Do not remove contamination from clothing or equipment by blowing, shaking, or any other means that disperses contaminants into the air.
- Be alert for potential hazards associated with moving equipment and to traffic patterns of support vehicles.
- Do not allow personnel underneath or immediately adjacent to suspended loads handled by digging or lifting equipment.

- Handle drums and containers of unknown content or which may be shock sensitive in accordance with 29 CFR 1926.65(j), as applicable.

4.2.1.4 Packaging, Labeling, Handling, Transport, Storage, and Disposal of Hazardous Substances

- Requirements and procedures for packaging, labeling, handling, transport and/or disposal of hazardous materials and wastes shall be specified in the SSHASP or the site-specific waste management plan. For field operations where a site-specific waste management plan has not been prepared, these requirements and procedures shall be included in appropriate sections of the SSHASP.
- Procedures shall meet applicable OSHA requirements of 29 CFR 1926.65(j), 1926.152, and applicable OSHA standard(s) in Subpart Z of 29 CFR 1926 or 1910 for the substance(s) that are deemed of occupational health concern in the SSHASP hazard assessment.
- Procedures also shall meet applicable U.S. Department of Transportation (DOT) requirements (49 CFR Parts 106, 107, 130, and 171 through 180).
- Hazardous materials and wastes shall be transported in accordance with relevant DOT requirements (49 CFR), including certification and registration of drivers (49 CFR 107 Subpart G).
- Hazardous wastes shall be labeled, stored, and inspected in accordance with 40 CFR Subtitle C.

5.0 SITE CONTROL

The necessary site-specific control measures shall be indicated in the SSHASP, some of which are required by applicable DOE and OSHA requirements (i.e., the OSHA HAZWOPER Standard and 29 CFR 1910 and 1926 Subpart Z standards). Site maps required by OSHA shall also be included in SSHASPs for HAZWOPER projects to show the intended locations of the specified controlled access zones and support facilities. DOE states (DOE, *Health and Safety Plan (HASP) Guidelines*) that, among other items, site maps should include

- site perimeter, prevailing wind direction, and drainage points;
- natural and man-made features such as buildings, containers, impoundments, pits, ponds, and tanks; and
- locations of work zones and/or contamination containment barriers.

Since some zone or facility locations may change as site work progresses, current locations of zones and decontamination stations must be explained to project team members and other affected personnel during HS tailgate meetings and documented (e.g., in a field logbook).

Descriptions of site controls shall indicate whether a zone or facility is restricted as a radiological control area, a radioactive materials management area, or an OSHA regulated area, and the related access control and hazard posting requirements. Whether the location of a facility is centralized onsite or localized at multiple work areas onsite, the means for demarcating each zone, and other posting requirements shall also be indicated. Postings must comply with applicable OSHA, LANL Radiation Protection Program, and ANSI requirements (i.e., ANSI Z535.2, "American National Standard for Environmental and Facility Safety Signs", and ANSI Z535.3, "American National Standard for Criteria for Safety Symbols").

6.0 EXPOSURE MONITORING

Site-specific exposure monitoring strategies, including action levels, that meet applicable DOE and OSHA requirements shall be specified in the SSHASP for each project task having associated requirements. Exposure monitoring strategies, including establishment of action levels, should be determined based on the hazards that can be monitored using analytical instrumentation and the published exposure limits and physical, chemical, and toxicological properties of the chemical and/or radioactive substances of concern. For radiological substances of concern, this information is included in the LANL Radiological Control Manual (LANL, LM 107-01.1). Guidance for monitoring and assessing occupational exposure to chemical, biological, physical, and radiological hazards is included in the *ER Project HS Guidance Manual* and has been provided by the DOE (DOE, *Health and Safety Plan (HASP) Guidelines, Handbook for Occupational Health and Safety During Hazardous Waste Activities*, and *Occupational Exposure Assessment Handbook*).

Action levels for exposure monitoring of radiological hazards have been established by ER/ESH-1 and are indicated in the *ER Project HS Guidance Manual* and the SSHASP. These action levels shall be used unless otherwise indicated and approved by ER/ESH-1.

6.1 Instruments, Methods, and Calibration

Exposure monitoring generally includes use of direct-reading instruments, personal dosimetry, and personal and area sampling, as necessary, to evaluate the hazardous conditions posed by the chemical and radiological substances onsite. In accordance with DOE and OSHA requirements,⁴ the following information shall be specified in the SSHASP for each type of monitoring instrument to be used for exposure monitoring:

- procedure for calibration, maintenance, and use;
- locations and frequencies of monitoring; and
- corresponding action level(s), response actions, and rationales.

To promote greater consistency among the various ER Project subcontractors and project teams, ESH-5 has developed exposure monitoring methods for the chemical exposure monitoring instruments most commonly used during ER Project field operations, which are included in the *ER Project HS Guidance Manual*. These optional methods include procedures and forms for calibration, maintenance, and use of chemical exposure monitoring instruments. Where OSHA has mandated methods in the chemical-specific regulatory standards in Subpart Z of 29 CFR 1926 or 1910, such methods shall be specified in the SSHASP. Where OSHA has not mandated a method for personal chemical dosimetry, the NIOSH Analytical Methods or OSHA preferred methods (OSHA, Chemical Information Manual) should be used. Project managers who choose to use alternate methods may be requested by ESH-5 to provide copy of the methods with the SSHASP, for review and approval per Sections 1.2 and 1.3.

Radiological instrumentation services must be conducted in compliance with requirements of the LANL Radiation Protection Program or the Subcontractor's approved Radiation Safety Program. Applicable regulatory drivers include: Standards for Radiological Control and Measurements (DOE Order 5480.11), 10 CFR 835, National Emissions Standards for Hazardous Air Pollutants (NESHAPs, 40 CFR 61), the DOE RadCon Manual, Radiation Protection Instrumentation Test and Calibration (ANSI N323), and Performance Standard for Health Physics Instrumentation (ANSI N42.17). Core requirements include:

- review, approval and assessment by LANL of instrumentation services quality documents,
- approval by ESH-4 of all fixed and portable radiation monitoring instrumentation used at LANL, and

⁴ DOE, *Handbook for Occupational Health and Safety During Hazardous Waste Activities*, the *Health and Safety Plan (HASP) Guidelines*, and 10 CFR 835; DOL, 29 CFR 1926.65[b][4][i][E].

- instrumentation records (Section 13.1).

Site health physics personnel shall monitor for alpha and/or beta/gamma radiation as specified in the SSHASP and in accordance with their individual RSAA and the mandatory LANL Radiation Protection Program documents. Health physics personnel shall use radiological instrumentation calibrated and maintained by ESH-4 or by an alternate means approved by ESH-4. Subcontractors shall abide by this requirement, unless the Subcontractor's Radiation Safety Program, which includes identification of instruments and corresponding procedures, has been approved by the UC per Section 1.2. All equipment leaving the site shall be monitored for release in accordance with the SSHASP and approved Subcontractor's Radiation Safety Program or the LANL Radiation Protection Program.

Results of exposure monitoring must be documented and affected personnel must be informed of these results in accordance with the requirements of Section 13.3. Forms for recording chemical exposure monitoring results are included with the respective monitoring instrument methods in the *ER Project HAS Guidance Manual*. Forms for recording radiological exposure monitoring results must be included in the Subcontractor's Radiation Safety Program or are available in the LANL Radiation Protection Program.

6.2 Analytical Laboratory Requirements

Analytical laboratories that analyze samples for chemical contamination for OSHA compliance purposes should be accredited by the American Industrial Hygiene Association (AIHA). Bulk (solid) asbestos samples must be collected by a certified Asbestos Inspector. Analysis of bulk asbestos samples must be by an analytical laboratory successfully participating in a nationally recognized testing program (i.e., the National Voluntary Laboratory Accreditation Program [NVLAP] or National Institute for Standards and Technology [NIST], or AIHA, or equivalent.) Samples of airborne asbestos collected for OSHA compliance purposes are to be collected and analyzed according to Appendix A of 29 CFR 1926.1101. Furthermore, OSHA requires that analysts of airborne asbestos samples must have completed the NIOSH course for sampling and evaluating airborne asbestos dust and that the laboratory should be participating in the Asbestos Registry sponsored by the AIHA or the Proficiency Analytical Testing (PAT) Program. (Refer to Appendix D for details of the entire LANL asbestos-related requirements.)

Analytical services for radiological analysis must be conducted in compliance with requirements of the LANL Radiation Protection Program or the Subcontractor's approved Radiation Safety Program. Applicable regulatory drivers include: Standards for Radiological Control and Measurements (DOE Order 5480.11), 10 CFR 835, the DOE RadCon Manual, and National Emissions Standards for Hazardous Air Pollutants (NESHAPs, 40 CFR 61). Core requirements include review, approval and assessment by LANL of analytical services quality documents. Samples being analyzed for radiological contamination should be analyzed by the LANL CST Division, ESH-4 Health Physics Analytical Laboratory (HPAL), a mobile extension thereof, or as indicated in the Subcontractor's approved Radiation Safety Program.

6.3 Personal Radiological Dosimetry

6.3.1 General Program Requirements

External dosimetry internal (*in vivo*) dosimetry, and dose assessment services must be conducted in compliance with requirements of the LANL Radiation Protection Program or the Subcontractor's approved Radiation Safety Program.

Applicable regulatory drivers for external dosimetry services include: Standards for Radiological Control and Measurements (DOE Order 5480.11), 10 CFR 835, DOE Laboratory Accreditation Program for Personnel Dosimetry (DOE Order 5480.15), the DOE RadCon Manual, Environmental Protection Information Reporting Requirements (DOE Order 5484.1), and DOE LAP Certification Standard for Extremity Dosimetry Systems (pending). Core requirements include:

- review, approval and assessment by LANL of external dosimetry services quality documents,

- dosimetry records (Section 13.2),
- provision of services for measuring and recording non-uniform exposure such as exposure to the lens of the eye as required by 10 CFR 835, and
- monthly dosimetry reading frequency.

Applicable regulatory drivers for internal (*in vivo*) dosimetry services include: Standards for Radiological Control and Measurements (DOE Order 5480.11), 10 CFR 835, DOE RadCon Manual, Performance Criteria for Radiobioassay (ANSI N13.30), American National Standard for Internal Dosimetry for Mixed Fission and Activation Products (ANSI N343), DOE Laboratory Accreditation Program (DOELAP) Certification Standard for Whole Body Distributed Radionuclides (pending), and DOELAP Certification Standard for Lung-Deposited Actinides (pending). Core requirements include *in vivo* records (Section 13.2), and review, approval and assessment by the UC of *in vivo* services quality documents.

Applicable regulatory drivers for dose assessment services include: Standards for Radiological Control and Measurements (DOE Order 5480.11), 10 CFR 835, DOE RadCon Manual, Performance Criteria for Radiobioassay (ANSI N13.30), Recommendations of the International Commission on Radiological Protection (ICRP Publication 60), Limits for Intakes of Radionuclides by Workers (ICRP Publication 30), and Use of Bioassay Procedures for Assessment of Internally Radionuclide Deposition (NCRP Report Number 87). Core requirements are the same as for *in vivo* dosimetry only applicable to dose assessment services.

6.3.2 Site-Specific Requirements

Requirements for personal radiological dosimetry or radiation exposure shall be determined by ER/ESH-1 and ESH-12 personnel during review of the draft SSHASP, unless the Subcontractor's Radiation Safety Program addressing personal radiological dosimetry, which has been approved by the UC, requires otherwise. Field personnel who are directly covered by the LANL Radiation Protection Program shall complete a Health Physics (HP) checklist. Guidance for this process is provided in the *ER Project HS Guidance Manual*. Enrollment in personal radiological dosimetry programs (*in vivo* and *in vitro*) will be based on requirements established in the SSHASP which have been approved by ER/ESH-1. ESH-12 Radiation Information Management Team will provide reports of dosimetry results to individuals enrolled in this program by distributing the reports to ESH-5, in a confidential manner per Section 13.3.

7.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Task-specific PPE requirements that meet applicable OSHA requirements shall be indicated in the SSHASP or specifically in an RWP. However, before requiring project team personnel to use PPE, appropriate administrative and engineering controls shall be implemented as the first means of defense for mitigating hazards and protecting site personnel.

In accordance with applicable OSHA regulations (29 CFR 1926 Subparts E and I) and DOE (DOE RadCon Manual), personnel shall not be allowed to use PPE unless the hazards for which the PPE are intended to protect against have been assessed and the appropriate PPE has been specified in writing by a qualified HS professional. PPE requirements must be based on a hazard assessment (Section 4.1) that includes a comparative evaluation of site conditions, task-specific operations, potential hazards relative to the performance characteristics of the PPE items, and anticipated durations of use.

Personnel who use PPE to perform a job shall be trained to recognize the limitations of the equipment and to properly select, fit, use, inspect, maintain, and store the equipment. Such training shall occur and be documented before the user enters an area requiring the use of the PPE. To promote greater consistency among the various ER Project participants and project teams and to facilitate compliance with 29 CFR 1910.132(f) and 29 CFR 1926.65(g)(5), ESH-5 has developed a procedure addressing limitations, selection, fitting, use, inspection, and maintenance of PPE, which is included in the *ER Project HS Guidance Manual*.

Where OSHA has mandated methods in the chemical-specific regulatory standards in Subpart Z of 29 CFR 1926 or 1910, such methods, as applicable, shall be specified as requirements in the SSHASP. Personnel who use ANTI-Cs shall have successfully completed Radiological Worker II training (Section 10.2.4).

Whenever a significant change in site conditions or operations occurs, the PPE requirements shall be reassessed by a qualified HHS professional, the SSO, or RCT. The SSHASP shall be modified, as necessary, to indicate the revised PPE requirements.

It is the responsibility of each user of PPE to inspect the equipment before and as necessary during each use. Personnel wearing PPE shall be monitored periodically by a qualified person to ensure that they are adequately attired and protected.

7.1 Respiratory Protective Equipment

Use of respiratory protection must comply with requirements of 29 CFR 1910.134, American National Standard for Respiratory Protection (ANSI Z88.2-1992), this document and the applicable SSHASP. Where respiratory protective equipment requirements are mandated by OSHA in the chemical-specific standards in Subpart Z of 29 CFR 1926 or 1910, such requirements, as applicable, shall be specified as requirements in the SSHASP. Personnel required to use respirators shall have certification of current training, medical fitness, and respirator fit-testing in accordance with these requirements, which are summarized in this section. Subcontractors whose employees use respiratory protective equipment to perform ER Project work shall provide documentation to support compliance with each aspect of the mandated standards.

Employers of personnel who wear respirators to perform ER Project work shall maintain and implement a current written respiratory protection program, which addresses the requirements described below, unless the employer opts to abide by the LANL Respiratory Protection Program. Whenever air-supplying (Level B) respiratory protection will be used, project-specific SOPs addressing the requirements and procedures for using the Level B equipment shall be submitted similarly for review and approval by appropriate ESH personnel.

If any of the topics addressed in this section have been addressed sufficiently in the Subcontractor's HAZWOPER program, they need not be repeated in the respiratory protection program. The information should be cross-referenced appropriately and supplemented by application-specific information as necessary (e.g., respirator type/model specific training).

7.1.1 Designated Qualified Person

Respiratory protection programs shall include designation of a qualified individual who supervises the respiratory protection program in accordance with 29 CFR 1910.134(e)(2) and (e)(4) and Section 3.2.3.6.

7.1.2 Implementation of Administrative and Engineering Controls

Each employer of employees who use respiratory protective equipment is required by OSHA to have a policy that describes the administrative and engineering controls to be used to prevent or minimize employee exposure to atmospheric contamination. This policy must also include a statement to the effect that when it is not feasible to implement such a policy or while the controls are being implemented, respiratory protection shall be used in accordance with applicable requirements.

7.1.3 Use of Approved Equipment

Respiratory protective equipment shall be selected from equipment jointly approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11 (Office of the Federal Registrar). The Subcontractor's program shall include identification of the type of equipment [manufacturer(s) and model(s)] to be used and the associated NIOSH/MSHA approvals.

7.1.4 Standard Operating Procedures

Each written respiratory protection program shall include standard operating procedures that govern selection, use, cleaning, maintenance, inspection, and emergency use of respirators; training of supervisors and respirator wearers; and recordkeeping. Respiratory protection plans prepared by subcontractors should provide enough information to allow LANL reviewers to understand the decision logic for selecting and using a particular kind of respirator. This information should include a hazard identification and evaluation process (including oxygen-deficient conditions and conditions immediately dangerous to life or health [IDLH]) and a corresponding respirator selection process. When required by other regulations (e.g., Subpart Z of 29 CFR 1926 or 1910), these evaluations must include historical sampling data or other method(s) of assessing exposure (Section 4.1.). Selection criteria are included in Sections 4.5.4 and 7 of the American National Standard for Respiratory Protection (ANSI Z88.2-1992).

7.1.5 Respirator Users' Medical Status

Employees shall not be assigned to perform tasks requiring the use of a respirator unless the employee has had an annual medical exam that demonstrates his/her ability to perform work while using the respirator. The employee shall obtain the written opinion of a qualified physician (preferably one specializing in occupational medicine) verifying that s/he is able to wear a respirator (Section 11). The physician shall determine which health and physical conditions are pertinent. Criteria for conducting the medical evaluations are provided in the *American National Standard for Respiratory Protection—Respirator Use—Physical Qualification for Personnel* (ANSI Z88.6)

7.1.6 Training

Respirator users shall be instructed and trained in the limitations and proper use of respiratory protective equipment by a competent person (Section 3.2.3.6). The user, supervisor or SSO, and issuer of respirators shall be trained in the proper use, maintenance, and storage of respirators and their limitations. Subcontractors should outline the training provided to their employees.

7.1.7 Fit-Testing

Only individuals who have been trained and quantitatively fit-tested for the specific manufacturer and model of respirator facepiece being used may use the respirator while performing ER Project work. Fit-Tests shall be conducted in accordance with the American National Standard for Respiratory Protection (ANSI Z88.2-1992). The maximum protection factor for half-face air-purifying respirators is 10 times the PEL or threshold limit value (TLV) of the most toxic contaminant against which the respirator must protect, provided the wearer achieved a respirator fit factor of at least 100 during the fit-test. Similarly, the maximum protection factor for full-facepiece air-purifying respirators is 100 times the PEL or TLV of the most toxic contaminant against which the respirator must protect. (Refer to Section 4.1 where discussion of hazard assessment and determination of hazardous substances of occupational health concern is provided.)

7.1.8 Work Area Surveillance

Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained by a qualified person (i.e., SSO, industrial hygiene technician, RSP, HPT, and RCI). This requirement can only be satisfied by assessing hazards and monitoring exposure (Sections 4 and 6). Subcontractors can use a combination of engineering analysis and air sampling data to document conditions.

7.1.9 Cleaning and Disinfection

Respirators shall be cleaned and disinfected as frequently as necessary to ensure that the user is properly protected. Respirators used by more than one worker or intended for emergency use shall be thoroughly

cleaned and disinfected after each use. The respiratory protection program should outline the cleaning and disinfection methods and frequencies used to ensure complete cleaning and disinfection.

7.1.10 Inspection and Repair

Respirators used routinely shall be inspected by the user before each use and after each cleaning. Respirators for emergency use shall be inspected by a qualified person at least monthly and after each use. Worn or deteriorated parts shall be replaced.

7.1.11 Storage

Respirators shall be stored in a convenient, clean, and sanitary location and in a manner that prevents damage during storage. A brief description of how the Subcontractor intends to handle this issue is sufficient.

7.1.12 Quality Assurance

There shall be regular inspections and evaluations to determine the effectiveness of the respiratory protection program. This can be accomplished through the use of documented checks by a designated knowledgeable supervisor, an outside agency, or an independent consultant.

7.1.13 Other Requirements

In addition to the above outlined requirements, there are other requirements identified in the OSHA standard that may need to be addressed in the Subcontractor's respiratory protection program. Examples would include air quality where supplied-air systems (Level B) will be used; equipment associated with any atmosphere supplying respirators (e.g., hoses, compressors, air line couplings, and containers); and emergency egress for environments where the air quality may be IDLH. The type of information that must be provided by the Subcontractor is that which is necessary for LANL reviewers to verify regulatory compliance.

In accordance with the *American National Standard for Respiratory Protection* (ANSI Z88.2-1992), the UC requires that periodic air samples be collected from air compressors used to produce breathing air. These samples must be collected as part of acceptance testing of a compressor and periodically during use. The quality of breathing air shall meet or exceed the specifications for "Grade D" air established by the Compressed Gas Association (ANSI and the Compressed Gas Association, *Commodity Specification for Air, ANSI/CGA G-7.1-1989*).

8.0 DECONTAMINATION

Procedures for personnel and equipment decontamination must be indicated in each SSHASP for HAZWOPER projects. Site-specific variances from general procedures shall be indicated in the SSHASP or other project-specific documents or records. The following general requirements apply to personnel and equipment decontamination processes for ER Project work at HAZWOPER sites:

- Personnel, equipment, and vehicles must be decontaminated, as necessary, before exiting the CRZ; clothing and equipment that cannot be decontaminated sufficiently shall be properly contained and labeled prior to being transferred beyond the controlled work zones of the site. For sites having only radiological contamination, it is appropriate to first screen for radiological contamination to determine whether decontamination is necessary.
- If any significant contamination is encountered, PPE should be disposed rather than decontaminated for reuse.

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- Loose contaminants (dusts and vapors) that cling to clothing or equipment shall be removed according to the applicable decon procedures (e.g., using a water or water-based detergent rinse and scrub brush), except when radiation action levels are exceeded.
- Care shall be taken to avoid generation of mixed (chemical and radiological) waste during decontamination operations.
- Rinse water and waste generated onsite shall be contained, temporarily stored and disposed in compliance with applicable OSHA regulations (e.g., 1926.152).

Optional strategies for standard and extensive personnel decontamination are provided in *ER Project HS Guidance Manual*. These strategies include procedures, decontamination facility diagrams, and suggested equipment for operations involving use of Levels D, C, and B PPE.

Where a centralized decontamination pad or facility will be established for decontaminating heavy equipment (e.g., rigs, augers, loaders), site-specific procedures for addressing transport of equipment from the work site to the centralized decontamination facility in a manner that minimizes the potential for, or contains the spread of, contamination are also to be indicated in the SSHASP. Guidance for decontamination of exposure monitoring equipment is provided in the *ER Project HS Guidance Manual*.

Decontamination activities shall be monitored periodically by a qualified person to determine their effectiveness. If procedures are found to be ineffective, steps shall be taken to correct deficiencies, and any deviations from the SSHASP shall be documented.

8.1 Disposal Versus Laundering of PPE

Used PPE shall not be transferred into uncontaminated areas of the site unless it has been appropriately screened for contamination, contained or packaged, and labeled as necessary. Used PPE should be handled and temporarily stored pending analytical results as though it is suspect contaminated waste.

Although protective clothing may be either disposable or nondisposable, at some LANL work sites even disposable protective clothing may be reused by project team members. However, even at sites where the types and concentrations of contaminants are insignificant and work activities are nonstrenuous, disposable protective clothing should be disposed at least weekly because of wear and tear that eventually would compromise the integrity of the protective material.

Nondisposable protective clothing (e.g., cotton or insulated coveralls) should be laundered at least weekly. Such PPE must be placed in a labeled container before being transferred to a designated laundry facility for cleaning and eventual reuse. Special instructions for containing, transporting and cleaning nondisposable PPE, if any, (including acceptance criteria for "decontaminated" or "clean" classification) must be indicated in the SSHASP. Requirements for properly notifying laundry management of the potential for hazardous contamination in accordance with the OSHA Hazard Communication Standard (29 CFR 1926.59) must also be indicated in the SSHASP.

8.2 Special Procedures for Decontamination of Radiologically Contaminated PPE and Environmental Monitoring Equipment

When radiological contamination is detected above background levels, ER/ESH-1 shall be contacted before the contaminated item is removed from the EZ. Decontamination and disposal of PPE shall be conducted in accordance with the requirements of the Subcontractor's UC approved Radiation Safety Program or the LANL Radiation Protection Program and as indicated in the SSHASP.

8.3 Emergency Decontamination of Personnel

Decontamination of personnel in an emergency is discussed in Section 9.3.1.4.

9.0 EMERGENCY PLAN

This section describes generic aspects of the emergency/incident action plan that apply to all field operations of the ER Project. Site- and facility-specific details of this plan and the necessary equipment and supplies to execute this plan shall be indicated in the SSHASP. The personnel who will enact the emergency/incident action plan, their training, and the associated equipment and supplies that are to be kept on-hand at the site shall also be indicated.

This section has been developed to meet the requirements of 29 CFR 1926.24 and 1926.65(l), and as applicable, 29 CFR 1926.35(b) or 1926.65(q). It addresses the general contingency planning, response action, and associated personnel and equipment requirements in the event of an incident or emergency that must be addressed in each SSHASP. Explanations and definitions for determining the category of an unplanned or uncontrolled event are provided in the *ER Project HS Guidance Manual*. It is critical to understand this information to determine whether the SSHASP must contain an Emergency Action Plan (in compliance with 29 CFR 1926.35) or an Emergency Response Plan (for work at uncontrolled hazardous waste sites in compliance with 29 CFR 1926.65(l)).

The FTL or JS, or his/her delegate, shall direct and coordinate responses to emergencies until off-site emergency responders arrive and implement the incident command system. DOE and OSHA require that the emergency plan be rehearsed regularly as part of the overall training program for site operations, therefore, on the first day of onsite operations the emergency plan shall be rehearsed with all field team members. Also, OSHA requires that off-site emergency responders (e.g., the Fire Dept., HAZMAT Team and EM&R) be notified in advance of initiating field activity where there is the likelihood that off-site responders may be required.

Onsite spills or releases of hazardous substances shall be handled in accordance with applicable requirements of this section and according to an approved site-specific spill prevention control and countermeasures plan prepared in accordance with the LANL Spill Prevention Control and Countermeasures Plan.

9.1 Posting Requirements

At the start of field operations, emergency contacts and phone numbers, reporting information, emergency equipment, and maps of the route(s) to the Los Alamos Medical Center and to the LANL Occupational Medicine Clinic (ESH-2) shall be posted at a location onsite where personnel may readily access the information. This site-specific information shall be included in the SSHASP.

9.2 Emergency Alerting and Site Evacuation Procedures

The FTL or JS, or his/her delegate (e.g., an SSO), shall determine site-specific emergency alerting procedures, evacuation procedures and routes, and locations of muster areas. This information must be included in the SSHASP and shall be communicated by the SSO, a qualified HS professional, or the FTL or JS to onsite personnel during the pre-job start HS briefing and/or the tailgate HS meetings. DOT provides information for determining the extent of and safe distances for evacuation (DOT, latest edition *Emergency Response Guidebook*), which shall be referenced or cross-referenced in the SSHASP for each chemical substance expected onsite in sufficient form and quantity that, if an uncontrolled release were to occur, site evacuation would be likely. Evacuation routes and muster areas should be predominately upwind, uphill, and upstream of work areas where fire or release of chemicals or radiological contaminants might occur.

An employee alarm system shall be specified in the SSHASP and shall be established at the work site in compliance with 29 CFR 1926.159 or 1926.65(l)(3)(vi), as applicable. The SSHASP shall also include means and methods for alerting various off-site management and emergency response personnel of onsite events that could pose a threat to the FMU or adjacent facilities, and for designated FMU personnel to alert onsite personnel of events that could pose a threat to onsite personnel or operations (See the Laboratory Standard on Emergency/Incident Reporting for specific information). The phone numbers or radio stations

of contact personnel at adjacent facilities (the Facility Manager or his/her designee) shall be included in the list of emergency contacts included in the SSHASP.

In the event of an incident necessitating evacuation:

- the FTL or JS, or his/her delegate, should alert off-site personnel of the emergency situation in accordance to LANL LIR-201-00-04.0;
- personnel should evacuate the site according to procedure(s) established during the pre-job start HS briefing or tailgate meeting, and should assemble at the designated muster area;
- the FTL or JS, or his/her delegate, is responsible for accounting for all onsite personnel at the muster area to determine whether any personnel are missing; and
- evacuated personnel shall remain at the muster area until the re-entry alarm is sounded or an authorized individual provides further instruction.

9.3 Procedures for Onsite Responders

Onsite personnel who are trained and equipped to respond to incidents in accordance with Section 9 shall implement the following general response procedures:

- Establish a communication center, make appropriate notifications per LIR 201-00-04.0 and maintain telephone or radio communication with appropriate off-site support experts. Arrange for an escort to intercept and direct off-site responders to the site.
- Assess existing and potential hazards to personnel and the environment onsite, and to off-site individuals and property or facilities. Isolate the incident or emergency area and prohibit access by unauthorized people.
- As feasible, perform rescue, first-aid, and/or CPR duties as trained.
- To the extent possible and necessary, conduct emergency decon (Section 9.3.1.4).
- Treat all releases of unknown substances as though a highly toxic or hazardous substance is involved (i.e., contact the LANL EM&R).
- Stop, retard, and/or contain the source and flow of hazardous discharge to the extent possible and necessary using available onsite equipment and supplies with which response personnel have been sufficiently trained to use for emergency response purposes (Section 9). Examples of such actions may include application of absorbent materials (e.g., spill pillows, vermiculite, sand, or dirt) and/or construction of berms or dikes at a safe distance around the spill or leak source.
- Record chain of events including times of occurrence.

9.3.1 First Aid Emergency Medical Treatment

In accordance with 29 CFR 1926.50, provisions shall be made prior to commencement of field operations for prompt medical attention in case of serious injury or illness. In the absence of a hospital or clinic that is reasonably accessible in terms of time and distance to the work site (i.e., capable of rendering treatment within four minutes of occurrence of the injury or illness), a person who has a valid certificate in first-aid training from the American Red Cross, or equivalent, shall be available at the work site to render first-aid, and a vehicle shall be maintained onsite ready for use to transport the victim(s) off-site for medical treatment. In the event that victims are transported via private/government vehicles, attempts will be made to establish a medical intercept to facilitate the application of appropriate medical attention. As necessary, maintain appropriate medical emergency response supplies and equipment (e.g., first-aid and biopathogen kits) onsite. Contents of first-aid kits must be physician approved and should meet the *American National Standard Minimum Requirements for Industrial Unit-Type First Aid Kits* (ANSI Z308.1-1978). The OSHA interpretation of 1910.1030 for employee protection from exposure to bloodborne pathogens is that requirements of 1910.1030 (e.g., training, a written bloodborne pathogen control program, etc.) are

applicable for any employee expected to render first-aid or CPR on-the-job. Hepatitis B vaccination, post-exposure evaluation, and follow-up will be made available to all employees who have had an occupational exposure.

A plutonium wound count is required if a wound occurs in a work area where plutonium (or another alpha-emitting transuranic) is a suspect contaminant and if:

- alpha contamination is found in the vicinity of the wound;
- alpha contamination is found on the object which caused the wound,
- the object which caused the wound cannot be monitored, but is suspected, for any reason, of being plutonium contaminated; and
- the worker or her/his supervisor specifically requests a plutonium wound count.

Both ESH-2 and the Los Alamos Medical Center decontamination facility (662-2455) are capable of performing plutonium wound counting.

Emergency eyewashes and/or showers must be located within 10-seconds travel time and not more than 100-ft. travel distance of any work area where chemical splash hazard of substances that are caustic, corrosive, or toxic by skin absorption exists. Each unit must have the capacity to be able to provide continuous flushing for the duration of time necessary to sufficiently flush the most hazardous substance for which the device is being specified. They also are to be inspected and flushed per the manufacturer's instructions. Refer to ANSI Z358.1-1990 for further information.

A copy of the HASP and SSHASP shall be kept in the vehicle designated for emergency transport of victims and shall be given to emergency medical care providers. First-aid supplies, including protective equipment for rendering first-aid and CPR and a biopathogens kit, shall be maintained accessible and ready for use in the support zone (SZ).

9.3.1.1 Life-Threatening Illness/Injury

Victims who sustain life-threatening injuries or illness should receive life-saving care immediately without prior decontamination. If the victim has been contaminated by an extremely toxic or corrosive material that could cause severe injury or loss of life either to the victim or to the people administering first aid, then the victim should be decontaminated immediately in a manner as safe and effective as possible. Personnel experiencing a life-threatening medical crisis are to be decontaminated only if decontamination of the victim would not be expected to result in greater endangerment of the victim.

In life-threatening situations, qualified persons designated in the HASP and the SSHASP should

- implement appropriate first-aid procedures and immediately phone 911,
- take measures to prevent further damage or injury, and
- notify the FAPL and ER/HS Representative as soon as possible.

9.3.1.2 Non Life-Threatening Illness/Injury

In the event of an onsite incident necessitating medical care, the worker shall report to ESH-2 for initial evaluation and care as soon as possible, the FTL or JS, or his/her delegate, shall arrange for notification of EM&R and the employee's immediate supervisor. EM&R will determine what additional notifications need to occur including, but not limited to; DOE, ESH-7, ESH-2, and facility management.

In all instances resulting in lost workdays employees, both subcontractor and UC, must report to the Occupational Medicine Group (ESH-2) prior to resuming regular work duties.

9.3.1.3 Hazardous Substance Exposure

In the event of an injury or an illness with symptoms of over exposure to hazardous substances, qualified coworkers should immediately provide first-aid to the victim(s), assure notifications per LIR 201-00-04.0 and transport the victim(s), as appropriate for initial medical evaluation and triage to the LANL Occupational Medicine Clinic (ESH-2, TA-3, SM 409, phone: 667-0660) during business hours (M-F 7:30 a.m. to 5:00 p.m.) or after hours to the Los Alamos Medical Center at the location indicated on the postings included in the SSHASP. At sites having radiological substances deemed of occupational health concern, injuries resulting in dermal abrasions where the outer surface of the skin is broken must be evaluated by ESH-2.

9.3.1.4 Exposure to Another's Blood or Body Fluids

Anyone who renders first aid involving exposure to another person's blood or body fluids may be at risk of exposure to disease that may be transmitted through contact with the other person's blood or body fluids. UC and non-UC employees who have rendered occupational first-aid or CPR and have been exposed to another person's blood or body fluids shall immediately report to the LANL Occupational Medicine Clinic (ESH-2, TA-3). In addition, non-UC employees who have rendered first-aid or CPR should also notify their management or company HS representative to determine appropriate follow-up action in accordance with their employer's bloodborne pathogen program.

9.4 Reporting Emergencies/Incidents

Guidance for making notifications and processing reports and investigations in follow-up to an emergency or incident is provided in the *ER Project HS Guidance Manual*. Accidents, emergencies, incidents, injuries, and illnesses must be reported as soon as possible to the FAPL and the ER/HS Representative, and if radiological exposure is involved, the ER/ESH-1 Representative, who will initiate the necessary action to comply with DOE and LANL occurrence and radiation incident reporting requirements. In the event of an occurrence necessitating medical care, key personnel listed in the SSHASP (i.e., other line managers and the employee's manager) shall be notified as soon as possible.

Subcontractors are to notify their LANL Contract Administrator within 24 hours of any occupational injury resulting in lost workdays and/or any loss or damage to Government property. Copies of all accident and injury/illness reports shall be sent to the Contract Administrator, the ER/HS Representative, and to the Industrial Hygiene and Safety Group (CAIRS/Injury/Illness Reporting System). Additionally, all subcontractors must report all work related injuries/illness at the end of the year to the Contract Administrator and the CAIRS/Injury/Illness Reporting System per the requirements of the OSHA 200 Log.

9.5 Response Critique and Follow-up

Before normal site activities are resumed, the FAPL, or his/her delegate, shall evaluate the incident or emergency to determine

- the cause;
- effectiveness of emergency/incident planning, preparedness, and response;
- how the emergency or incident could have been prevented; and
- considerations for improvements of the emergency/incident response plan.

Points to be considered include whether procedures were adequate and were implemented correctly and in a timely manner. Also before resuming normal site activities, personnel must be fully trained and equipped to handle another emergency or incident. This requires restocking emergency equipment and supplies, and inspecting, testing, and resetting emergency equipment and systems.

10.0 TRAINING

Described in this section are the DOE, OSHA, and LANL HS training requirements applicable to ER Project participants. In accordance with applicable OSHA training requirements, project team personnel shall have the necessary training to perform their assigned task(s) and associated responsibilities. Before the FTL or JS tasks a project team member with performing an ER Project field duty, s/he, or his/her delegate, shall verify that the project team member has current certifications of required training.

UC employees (including UC contract employees) are eligible to take any LANL courses offered by ESH-13 and BUS-6. Subcontractors to the ER Project are responsible for implementing their own training programs. With the exception of LANL-specific training described under Section 10.2, training offered by ESH-13 is available to ER Project subcontractors for a fee, and only by referral of an FAPL. Training offered by BUS-6 is also available to ER Project subcontractors for a fee.

10.1 General Requirements

The training requirements of this section apply to all ER Project field operations.

10.1.1 Pre-Job Start HS Briefing

The SSO, or a qualified HS professional, shall conduct training on the contents of the SSHASP before field work begins so that each project team member is informed of the site-specific information and requirements applicable to the scope of work. This HS briefing shall cover the SSHASP contents and applicable portions of the HASP. Topics covered and attendance shall be documented.

10.1.2 Tailgate HS Meetings

Before beginning each day of field work, and as necessary during the day, the FTL or JS, SSO, or a qualified HS professional, shall conduct a tailgate HS meeting to inform personnel of

- any newly identified hazards and associated monitoring and exposure control measures and results not discussed previously, and
- problems or concerns (especially HS) that have arisen since the previous tailgate meeting.

Field team members should be encouraged to discuss any health- or safety-related concerns during this meeting without fear of reprisal. Topics covered and attendance shall be documented.

10.1.3 First-Aid/CPR and Bloodborne Pathogens

In accordance with 29 CFR 1926.50, in the absence of a hospital or clinic that is reasonably accessible in terms of time and distance to the work site (i.e., capable of rendering treatment within four minutes of occurrence of the injury or illness), a person who has a valid certificate in first-aid training from the American Red Cross, or equivalent, shall be available at the work site to render first-aid. The OSHA interpretation of 1910.1030 for employee protection from exposure to bloodborne pathogens is that requirements of 1910.1030 (e.g., training, a written bloodborne pathogen control program, hepatitis-B vaccination, etc.) apply to any employee expected to render first-aid or CPR on-the-job. Refer to Section 9.3.1 for more detailed information concerning first-aid during emergency response.

10.1.4 Site Safety Officer

SSOs shall have the necessary training to develop and implement the applicable SSHASP and to implement HASP requirements. Guidance criteria for determining SSO qualifications are provided in the *ER Project HS Guidance Manual*. (Refer also to Section 3.2.3.1.)

10.1.5 Industrial Hygiene Technician

Industrial hygiene technicians shall have the necessary training to perform their assigned task(s) and associated responsibilities as defined in Section 3.2.3.2.

10.1.6 Health Physics Personnel

In accordance with applicable DOE, OSHA and LANL requirements, health physics personnel shall have the necessary training to develop and implement health physics-related sections of the applicable SSHASP and to implement applicable HASP requirements. This training shall include the training required by ESH-1 for issuance of an RSAA (Section 3.2.4).

10.1.7 Other OSHA Required Personnel

OSHA has numerous other standards and associated training requirements applicable to ER Project work. Some of these requirements apply at a programmatic level and are addressed in Section 1.2.1. Other training requirements apply to specific individuals who are either a competent person or a qualified person in the subject matter pertaining to their job function (Section 3.2.3.6), as defined by OSHA (29 CFR 1926.32(f) and (m), respectively), and/or as defined by applicable operation- or substance-specific standards (29 CFR 1926 and/or 1910), which are referred to throughout the HASP and SSHASP. Examples of these types of training are those for fire extinguishing, confined-space entry, lockout/tagout of energized equipment, electrical safety, trenching and excavation, respiratory protection, bloodborne pathogen exposure control, etc. Site-specific training requirements meeting requirements of this section are dictated by the operations and conditions occurring onsite, and shall be specified in the SSHASP or in a modification to the SSHASP as the requirement arises.

10.2 LANL-Specific Requirements

There are certain LANL-specific training requirements included in this section that are applicable to personnel performing particular job functions at the LANL. Except for the training requirements in Section 10.2.5, the UC will provide training referenced in this section to ER Project participants at no cost to the employer of the trainee and without prior authorization of the FAPL. Related training offered by ESH-13 is provided in the *ER Project HS Guidance Manual*.

10.2.1 General Employee Training

Anyone who will perform ER Project field work and will be onsite (or a combination of sites) for more than 10 consecutive work days shall have current certification of having completed the LANL General Employee Training (GET). This training is LANL-specific and is provided by ESH-13.

10.2.2 Health and Safety Read Training

ESH-13 distributes an all worker memorandum regarding OSHA Rights and Responsibilities and General Employee Radiological Worker Training on an annual basis to meet specific training requirements.

10.2.3 Radiological Worker II

Before beginning work at a site where radiological hazards exist or are expected, individuals must have completed the LANL Radiological Worker II training provided by ESH-13. Individuals who have completed this training at other sites in the DOE complex within the previous two years may transfer the core training and practical exercise, but must complete the LANL self-study Site-Specific Radiological Worker training provided by ESH-13. Each individual must requalify in Radiological Worker II training every two years while performing work at a site where radiological hazards exist or may be expected.

10.2.4 Waste Generator and Waste Management

10.2.4 Waste Generator and Waste Management

Waste management coordinators and generators of hazardous and mixed waste who must complete waste profile and waste disposal forms are required to complete the LANL Waste Documentation Forms Training.

10.2.5 FMU-Specific Training

Certain FMUs at the LANL have FMU-specific training requirements that all project team and support personnel must complete prior to being allowed access to the project site within the FMU. The Facility Manager, or his/her delegate, should be contacted to determine the necessary training.

This training also includes the high explosives (HE) corridor access training for personnel who work within the HE corridor. The DX or ESA Division Office should be contacted to schedule this training. Select project team members (to be identified in the SSHASP) are also required to complete the HE Identification Test Kit training class prior to initiating field activities at sites where HE is deemed a hazard of occupational concern in the SSHASP hazard assessment.

10.3 DOT Requirements

Individuals whose job function involves transporting hazardous substances are required to comply with 49 CFR 172.700-704 training requirements (e.g., to take at least the Hazardous Materials Packaging and Transportation [HMPT] Initial and General Awareness Safety training courses). There are additional training requirements for shippers and drivers of hazardous substances. BUS-6 provides this training to subcontractors for a fee. Equivalency for non-LANL courses is subject to BUS-6 approval. Contact BUS-6 at 7-1038 for further information.

10.4 RCRA Requirements

Waste management coordinators, hazardous and mixed waste generators, treatment, storage and disposal facility (TSDF) workers, and less than 90-day storage area workers are required to have training as defined by the EPA (40 CFR 260-270). These individuals must have completed a Waste Generation Overview. In addition, TSDF and less than 90-day storage area workers must complete RCRA personnel training and an annual RCRA refresher or their equivalents.

10.5 HAZWOPER Requirements

All employees working at a HAZWOPER site who may be exposed to safety or health hazards associated with hazardous waste operations, and their onsite supervisors and managers shall receive training meeting the requirements of this section before they are permitted to engage in HAZWOPER work. Employees are not permitted to participate in or supervise ER Project field activities until they have been trained to the level required by their job function and responsibility. Anyone who has not been certified in accordance with this section is prohibited from engaging in ER Project HAZWOPER field activities.

Employees and supervisors who have successfully completed the training and field experience requirements of this section shall be certified by their instructor, or the head instructor and trained supervisor, as having successfully completed the necessary training. OSHA requires that a written certificate shall be given to each person so certified.

Trainers shall be qualified to instruct employees about the subject matter that they are presenting. Trainers shall have the academic credentials and instructional experience necessary for teaching the subject(s), or have completed a training program for teaching the subject(s). Instructors shall demonstrate competent instructional skills and knowledge of the subject matter.

Employers who can show by documentation or certification that an employee's work experience and/or training has resulted in training equivalent to requirements of this section shall not be required to provide the initial training requirements of Sections 10.5.3 or 10.5.4. They shall certify this equivalency and provide a copy of this certificate to the employee.

If a project manager chooses to have onsite personnel take any action other than immediate evacuation of the site in the event of a release or substantial threat of release of a hazardous substance, onsite personnel must receive the training described in Sections 10.5.1 and 10.5.2, as applicable for the tasks to be performed. OSHA requires that personnel who have been trained in accordance with these section must receive annual refresher training of sufficient content and duration to maintain their competencies, or shall demonstrate their competency at least yearly. HAZWOPER training requirements for initial and refresher training shall be consistent with the latest LANL policies.

10.5.1 Initial 40-Hour Training and 24-Hour Supervised Field Experience

Individuals engaged in HAZWOPER activities that expose or potentially expose them to hazardous substances and health hazards shall receive a minimum of 40-hours of instruction off-site and 24-hours actual field experience under the direct supervision of a trained, experienced HAZWOPER supervisor.

10.5.2 Initial 24-Hour Training and 8-Hour Supervised Field Experience

Training requirements of this section pertain to individuals who are unlikely to be exposed to hazardous substances at levels above published exposure limits and who are

- onsite only occasionally to perform a specific limited task (e.g., ground water monitoring, land or geo-physical surveying);
- regularly onsite working only in areas that have been monitored and fully characterized indicating that exposures are under published occupational exposure limits, and the characterization indicates that there are no health hazards or the possibility of an emergency developing.

Individuals engaged in these HAZWOPER activities shall receive a minimum of 24-hours of instruction off-site and a minimum of 8-hours actual field experience under the direct supervision of a trained, experienced HAZWOPER supervisor. Individuals who have received this training and who subsequently are expected to perform work falling under the description of Section 10.5.3 shall complete an additional 16-hours of off-site training and 16-hours of supervised field experience to meet the requirements of Section 10.5.3.

10.5.3 Management or Supervisor Training

Managers and onsite supervisors of employees engaged in HAZWOPER work shall receive initial training (per 10.5.3 or 10.5.4, as applicable) and at least 8-hours of additional specialized training at the time of job assignment on such topics as, but not limited to, the employer's, and where appropriate, the LANL

- HS program and the associated training program,
- PPE program,
- spill containment program, and
- health hazard monitoring and techniques.

10.5.4 Annual Refresher Training

Individuals who have received the initial training in accordance with previous subsections in this section shall receive 8-hours annual refresher training on

- names of personnel and alternates responsible for the employer's HAZWOPER HS program;

- safety, health, and other hazards related to HAZWOPER work;
- use of PPE (Section 7);
- work practices by which the employee can minimize risks of exposure to hazards;
- safe use of engineering controls and equipment onsite;
- medical surveillance requirements (Section 11);
- Sections 4 through 6 of the ER Project HASP and relevant information in a model or example SSHASP; and
- applicable topics in Section 10.5.3.

Consistent with OSHA interpretations, completion of the Management or Supervisor training (Section 10.5.3) does not satisfy this training requirement.

11.0 MEDICAL SURVEILLANCE

Before the FTL or JS authorizes access to areas of the site where site controls have been established (e.g., EZ, CRZ, and OSHA regulated areas), it must be verified that personnel entering such areas have a current certification of medical evaluation and clearance (Appendix E or equivalent) in compliance with OSHA, DOE, and UC requirements. The site-specific medical surveillance requirements that meet applicable OSHA regulations and DOE requirements shall be specified in the SSHASP.

A written medical surveillance program that complies with requirements of this section shall be implemented by employers of personnel working for the ER Project (Appendix A). Each of the following employees shall be active participants in his/her employer's UC approved or the Subcontractor's medical surveillance program:

- Employees who are or may be exposed to hazardous substances or health hazards at or above OSHA permissible exposure limits or other applicable published exposure limits.
- Employees who wear a respirator during performance of work.
- Employees who are injured, become ill, or show signs or symptoms of possible over exposure to hazardous substances or who may be exposed to health hazards during performance of work regulated by 29 CFR 1910.95 (noise), HAZWOPER (29 CFR 1910.120 or 1926.65), or applicable OSHA standard(s) in Subpart Z of 29 CFR 1926 or 1910 for the substance(s) deemed of occupational health concern in the SSHASP hazard assessment.

11.1 Cost and Frequency of Examinations

Employers shall make available to each employee participating in this program medical examinations and consultations performed by or under the supervision of a licensed physician (preferably one knowledgeable in occupational medicine) at a reasonable time and place, without cost to or loss of pay by the employee. These examinations shall be available

- at least as frequently as specified in Appendix F of the HASP or an applicable standard, unless the examining physician believes a shorter or longer duration is needed or required;
- at termination of employment or upon reassignment to non-regulated work if the employee has performed field work with the potential for exposure since his/her last exam (initial or annual); a written explanation of a decision not to provide a termination examination shall be provided in the employee's medical file;
- as necessary for evaluation and treatment of occupational injuries;

- as soon as possible after notification that the employee has incurred a puncture wound at a job site where radiological contamination exceeds background levels, has been exposed to concentrations of contaminants above permissible or published exposure limits, or has developed symptoms indicating possible over exposure to hazardous substances or health hazards during performance of work; or
- at additional times for follow-up examinations or consultations as determined by the examining physician.

11.2 Content of Examinations

Initial (baseline) and annual medical examinations shall include at least the examinations and/or tests specified in Appendix F. The examining physician shall determine the content of periodic and termination examinations so that any changes from baseline examination results can be assessed in accordance with Appendix F.

11.3 Information to Be Provided to the Examining Physician

Together with the Physician Certification of Medical Evaluation Form (Appendix E or equivalent), the employer shall provide the following, as applicable, to the examining physician:

- a copy of the access to employee exposure and medical records standard (29 CFR 1910.20), the respiratory protection standard (29 CFR 1910.134), the occupational noise exposure standard (29 CFR 1910.95), the HAZWOPER standard (29 CFR 1910.120 or 1926.65), and/or applicable OSHA standard(s) in Subpart Z of 29 CFR 1926 or 1910 for the substance(s) deemed of occupational health concern in the SSHASP hazard assessment;
- a description of the employee's duties as they relate to the employee's exposures;
- the employee's actual or anticipated exposure levels;
- a description of any PPE (especially equipment for respiratory protection) actually or reasonably anticipated to be used during performance of work; and
- information from previous medical examinations of the employee not readily available to the examining physician. (This only applies to employees who are on temporary duty assignment and whose usual annual occupational medical evaluations are performed elsewhere.)

11.4 Information to be Obtained from the Evaluating Physician

The employer shall obtain, and furnish the employee with a copy of, a written opinion from the examining physician. Using the form provided in Appendix E or equivalent, this information must include

- the physician's opinion as to whether his/her examination revealed that the employee has any medical conditions that would place the employee at increased risk of impairment of the employee's health from assigned work (e.g., specifically noting compliance with applicable regulations);
- the physician's recommended limitations on the employee's assigned work, if any; and
- a statement that the physician has informed the employee of the results of the medical examination and any medical conditions that require further examination or treatment.

The written opinion provided to the employer shall not reveal findings or diagnoses unrelated to occupational exposures. The confidential results of the medical examination and tests shall be kept by the examining and/or evaluating physician, not the employer (unless the employer has a physician on staff who performs the medical evaluations). The results of the medical examination and tests shall be provided to the employee by the physician when requested in writing by the employee, at no cost to the employee in accordance with Section 13.2.

12.0 QUALITY CONTROL AND QUALITY ASSURANCE

12.1 Site Inspections

The construction Subcontractor shall conduct inspections of the work site in a manner and at a frequency sufficient to identify hazards and instances of noncompliance with project HS requirements, but not less than daily. The construction Subcontractor responsible for this duty is the prime ER Project Subcontractor, or where a prime is not involved, the Subcontractor performing the work.

The FAPL shall conduct inspections (safety walk-arounds) of his/her ER projects during periods of active construction. Inspections shall be conducted in a manner and at a frequency to comply with applicable LANL and ER Project requirements, but not less than monthly.

Records of inspections noting any hazards and the corrective actions taken shall be kept. Site-specific inspections to be performed by qualified or competent persons (Section 3.2.3.6) and the frequency of inspections should be specified in the SSHASP.

12.2 ER Project HS Oversight Implementation Plan

In accordance with recordkeeping requirements of Section 13, ER Project participants shall provide access to and/or furnish all documentation necessary to the UC, or its agent(s), to verify compliance with requirements of the HASP, SSHASP, or any applicable law or regulation. This support shall include maintenance of appropriate HS records at the site as required by the HASP, SSHASP, or any applicable regulatory requirement, or as deemed necessary by the FAPL.

ER Project participants shall support initial and periodic in-process verifications of compliance with applicable requirements. The initial verifications will consist of review of the applicable programmatic and project-specific HS documents, including any necessary supplements (such as individual verification records for training, medical, etc.) and the employer's or Subcontractor's program or written procedures that verify the existence of and compliance with applicable requirements. The periodic in-process verifications will include verification of ER Project participants' records that demonstrate compliance with requirements of the HASP, SSHASP and applicable regulations. In-process inspections will be conducted primarily at the field sites, but may involve the requirement to furnish current documentation not present at the field site.

Verifications and inspections may be conducted by the FAPL, his/her delegate, and/or representatives of the ESH Division. It is also anticipated that occasional verification by the LANL Audits & Assessments Branch or the DOE may be required.

ER Project participants are advised that the results of these inspections will be in writing and submitted to the LANL performance fee evaluation team and to appropriate LANL management personnel. A copy of the results will also be furnished to the affected employer(s) for resolution of discrepancies, if any.

If during the course of verification a circumstance is discovered that presents a threat of serious injury or death, notice will promptly be provided to the affected onsite supervisor and to the FAPL for action as directed in Section 3.5.

13.0 RECORDKEEPING

13.1 Site Records

A record of daily HS-related events shall be documented and kept onsite (e.g., in a bound logbook and/or on suitable forms). The FTL or JS, or his/her delegate (e.g., an SSO), shall verify employee training and medical surveillance records (Section 3.2.3.1). Health physics personnel shall keep records of health

physics-related events in accordance with requirements of their RSAA (Section 3.2.4). Records of all training must be maintained and available for oversight review. ESH-13 maintains training records of training provided by ESH-13 only. Site records shall be provided to the FAPL for storage at the LANL RPF in accordance with the applicable ER Project policy and/or procedure.

13.2 Employee Exposure and Medical Records

Employee exposure monitoring and medical records shall be retained by the employer of the employee in accordance with OSHA and DOE requirements (29 CFR 1926.33 and 10 CFR 835.401 through 404 and 1101[d]). Site records shall be provided to the FAPL for storage at the LANL RPF in accordance with applicable ER Project policy and/or procedure.

Exposure records for each employee monitored shall be maintained by the employer for 30 years. Specifically, records of radiological surveys, material and equipment release, exposure, dosimetry, dose assessments, and instrument maintenance and calibration shall be documented and maintained by appropriate project team personnel. These records will be subject to monthly or quarterly review by the UC or its agent(s).

Medical records shall not include examination or test results, but shall include the employee's name and social security number; the physician's written opinion (per Section 11.4) and recommended limitations; any medical complaints related to exposure of hazardous substances; and a copy of the information provided to the examining physician by the employer (not including a copy of the OSHA standard). A copy of the physician's written opinion and recommendations shall be forwarded to the Occupational Medicine Group (ESH-2). Subcontractors medical records and programs are subject to oversight review by ESH-2.

Records shall be retained in accordance with, though not limited to, the following requirements:

- To the extent permitted by law, the employer shall maintain and keep in confidence records for each employee.
- Medical records for each employee shall be maintained by the employer for the duration of employment plus 30 years (except health insurance claims records maintained separately from the employer's medical surveillance program records, first-aid records of one-time treatments, and medical records of employees who have worked for the employer for less than one year and who have seen the records before termination).
- Records shall be maintained to document doses of radiation received by all individuals for whom monitoring is required per 10 CFR 835.402 and doses received during planned special exposures, accidents, and emergency conditions.
- At an employee's request, the employer shall provide the employee access to his/her records.
- At an employee's written request, the employer shall ensure that representatives designated by the employee have access to his/her record(s). (A sample consent form is provided in Appendix A of 29 CFR 1926.33.)
- Whenever an employee, or his/her designated representative, requests access to an employee record, the employer shall ensure that access is provided in a reasonable time and manner. If the employer cannot provide access to the record(s) within 15 working days, before the 15th working day following the request for access, the employer shall apprise the requester of the reason for the delay and the earliest date the record(s) can be made available.
- Whenever an employee, or his/her designated representative, requests a copy of a record, the employer shall ensure that either
 - ◆ a copy of the record is provided without cost to such requester,
 - ◆ the necessary copying equipment is made available without cost to such requester for the purpose of copying the record, or

- ♦ the record is lent to such requester for a reasonable time to enable a copy to be made.
- Once a record has been provided without cost to the requester, the employer may charge a reasonable, nondiscriminatory administrative cost for subsequent copies of the record. However, an employer shall not charge for an initial request for a copy of new information that has been added to a record which was previously provided.

For purposes of follow-up investigation of an accident or incident, the employee's consent for the investigator(s) to access his/her records shall be obtained in accordance with 29 CFR 1926.33

13.3 Employee Notification of Personal Exposure Monitoring Results

In accordance with 29 CFR 1926.33, notification of personal exposure monitoring (dosimetry) results must be provided to each employee (including another employers' employee) for whom exposure monitoring was performed. The notification form must be reviewed and acknowledged by each employee for whom monitoring has been conducted and notification provided. A copy of the notification form shall be provided to the subject employee and to his/her supervisor.

These records are confidential and shall be dealt with as such in accordance with requirements of Section 13.2. The original form shall be retained with other original site records. Results of the exposure monitoring should be communicated to others in a manner that does not identify the employee for whom the monitoring was performed, including other affected onsite personnel during the tailgate HS meeting following receipt and evaluation of the results.

13.4 Emergency/Incident Records

Records of emergency or incident reports and follow-up investigations shall be processed according to Section 9.4.

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APPENDIX A

RADIOLOGICAL, HEALTH AND SAFETY PROGRAMS

SECRET

- reviewing and updating the program at least annually or whenever necessary to reflect new or modified job titles, tasks, or procedures effected by the program.

A3 Chemical Hazard Communication Program

In accordance with 29 CFR 1926.59(e), employers of employees who are occupationally exposed to hazardous chemicals are required to develop, implement, and maintain at the job site a written hazard communication program, which includes

- a list of the hazardous chemicals (excluding hazardous wastes) known to be present;
- a material safety data sheet (MSDS) for each hazardous chemical used by employees;
- means for ensuring that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the identity of the chemical(s) contained therein and appropriate hazard warnings;
- employee training about the following:
 - the location and availability of the hazard communication program,
 - the required list of chemicals and the MSDSs
 - methods for detecting the presence or release of hazardous chemicals in the work area
 - the physical and health hazards of the chemicals
 - the measures employees should take to protect themselves
 - the details of the employer's hazard communication program
 - the requirements of 29 CFR 1926.59
- methods the employer will use to inform employees of the chemical hazards associated with non-routine tasks;
- methods the employer will use to make available to other employers at multi-employer work sites the employer's copy of the MSDSs for the chemicals used by the employer at the site;
- methods the employer will use to inform other employers at multi-employer work sites of the precautionary measures to be taken to protect employees during normal operating conditions and foreseeable emergencies; and
- methods the employer will use to inform other employers at multi-employer work sites of the employer's labeling system used at the work site.

A4 Chemical-Specific Compliance Programs

At the time of this writing, OSHA regulates occupational exposure to the toxic chemical substances listed in below (Subpart Z of 29 CFR 1926 or 1910).

OSHA Regulated Chemical-Specific Standards		
13 Carcinogens (29 CFR 1910.1003): <ul style="list-style-type: none"> • 4-Nitrobiphenyl • α-Naphthylamine • methyl chloromethyl ether • 3,3'-Dichlorobenzidine (and its salts) • bis-Chloromethyl ether • β-Naphthylamine • Benzidine • 4-Aminodiphenyl • Ethyleneimine • β-Propiolactone • 2-Acetylaminofluorene • 4-Dimethylaminoazo-benzene • N-Nitrosodimethylamine 		
acrylonitrile (29 CFR 1910.1045)	cadmium (29 CFR 1926.1127)	lead (29 CFR 1926.62)
arsenic (inorganic) (29 CFR 1910.118)	coke oven emissions (29 CFR 1910.1029)	methylene chloride (29 CFR 1910.1052)
asbestos (29 CFR 1926.1101)	1,2-dibromo-3-chloropropane (29 CFR 1910.1044)	methylenedianiline (29 CFR 1926.60)
benzene (29 CFR 1910.1128)	ethylene oxide (29 CFR 1910.1047)	vinyl chloride (29 CFR 1910.1017)
1,3-butadiene (29 CFR 1910.1051)	formaldehyde (29 CFR 1910.1048)	

Most of these standards have a requirement that employers of employees who may be occupationally exposed to these chemicals above their permissible exposure limits (PELs) must establish and implement a written compliance program before commencing a task involving exposure to the chemical. These programs must be revised and updated at a certain frequency indicated in the respective standard. In the case of projects involving exposure to asbestos-containing material (ACM), the OSHA asbestos standard requires an exposure assessment and other requirements based upon the outcome of the exposure assessment. (Refer to Appendix F for highlights of minimum requirements applicable at the LANL for ER Project activities involving ACM.)

Each compliance program must include the information required by the respective chemical-specific standard, which may include all or part of the following chemical-specific information:

- a description of each activity in which the chemical is omitted, which includes the equipment used, material involved, controls in place, crew size, employee job responsibilities, operating procedures, and maintenance practices;
- a description of the specific means that will be employed to achieve compliance with the applicable OSHA standard;
- a report of the technology considered in meeting the PEL;
- air monitoring data that documents the source of emissions of the hazardous chemical;

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- a detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction, contracts, etc.;
- a work practice program which includes PPE training and use, housekeeping, and medical surveillance;
- a description of required work practices;
- an administrative control schedule as required by paragraph (e)(4) of the standard; and
- a description of arrangements made among employers on multi-employer sites with respect to informing affected individuals of potential exposure and means for preventing and protecting such individuals from over exposure.

A5 Confined-Space Entry Program (Permit-Required)

Employers of employees who will enter a confined-space shall maintain and implement a written confined-space entry program, which complies with 29 CFR 1910.146. A task-specific permit shall be prepared and approval signatures obtained (Section 1.2.3) before a confined-space is entered. This program must include

- the necessary measures to prevent unauthorized entry;
- a system for the preparation, issuance, use, and cancellation of confined-space entry permits;
- definition of responsibilities of persons who are to have active roles (e.g., authorized entrants, attendants, entry supervisors, and atmosphere-monitoring personnel) in entry operations and provision of such personnel;
- provision and definition of responsibilities of an attendant who will remain outside the confined-space into which entry is authorized for the duration of entry operations;
- provision of training required by 29 CFR 1910.146(g) for persons having active roles in entry operations;
- means for identifying and evaluating hazards of confined-spaces before employees enter them;
- means, procedures, and practices necessary for safe confined-space entry operations;
- procedures to coordinate entry operations when employees of more than one employer are performing entry operations simultaneously so that employees of one employer do not endanger employees of another;
- provision and maintenance of equipment specified in paragraphs (d)(4)(i) through (d)(4)(ix) of 29 CFR 1910.146 at no cost to employees;
- means for ensuring that employees use the equipment properly;
- means and methods for evaluating (testing and monitoring) environmental conditions of confined-spaces;
- procedures for summoning rescue and emergency services for rescuing and providing emergency services to entrants of confined-spaces, and for preventing unauthorized personnel from attempting rescue;

- procedures for canceling the permit and for concluding entry operations; and
- provisions for review and revision of the program, including review of canceled permits within one year after each entry and revision as necessary to ensure that employees participating in entry operations are protected from confined-space entry hazards.

A6 Hazardous Waste Operations (HAZWOPER) Program

Employers of employees who perform ER Project work must maintain and implement a written HAZWOPER program, which complies with the requirements of 29 CFR 1926.65(b). This program does not have to repeat portions of the employer's program that are documented elsewhere, but the information should be sufficiently cross-referenced. This program must include

- an organizational structure establishing chain of command and overall responsibilities of supervisors and employees (per 1926.65[b][2]);
- a comprehensive workplan addressing the tasks and objectives of the site operations and the necessary logistics and resources to accomplish the tasks and objectives (per 1926.65[b][3]);
- a SSHASP (per 1926.65[b][4] and the ER Project HASP);
- the employer's medical surveillance program (ER Project HASP Section 11);
- the employer's PPE program (ER Project HASP Section 7);
- the employer's respiratory protection program (ER Project HASP Section 7.1);
- the employer's HAZWOPER training program (ER Project HASP Section 10);
- the employer's HS standard operating procedures;
- any necessary interface between the general and site-specific HAZWOPER programs, plans, and activities; and
- means and methods for notifying others employers at multi-employer work sites of HS hazards associated with their activities and the corresponding emergency response procedures, and for making available the employer's HAZWOPER program to other such employers.

A7 Hearing Conservation Program

DOE and OSHA, under 29 CFR 1910.95(c), require an employer to implement a hearing conservation program whenever employees are potentially or actually exposed to occupational noise levels at or exceeding the 8-hour time-weighted action level of 85 decibels measured on the A-weighted scale (85 dBA). The employer's program must address

- training of employees concerning the hazards of excessive noise exposure, occupational exposure limits, and the topics listed below; training shall be conducted at least annually for employees with the potential for exposure to noise at or above 85 dBA;
- means and methods for monitoring and reducing noise exposure (e.g., administrative and engineering controls);
- means for posting work areas where the occurrence of excessive noise levels necessitates the use of hearing protection;

- selection, fitting, use, care, and determination of effectiveness of hearing protection; and
- audiometric [hearing] testing performed at least annually by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation, and at no cost to the employee.

A8 Laboratory Chemical Hygiene Plan

Where hazardous chemicals are used in a laboratory (including mobile laboratories) the employer shall develop and carry out the provisions of a Laboratory Chemical Hygiene Plan in compliance with 29 CFR 1910.1450. This plan shall include each of the following elements and shall indicate specific measures that the employer will take to ensure laboratory employee protection:

- standard operating procedures relevant to HS considerations to be followed when laboratory work involves the use of hazardous chemicals;
- criteria the employer will use to determine and implement control measures to reduce employee exposure to hazardous chemicals, including hygiene practices, engineering controls, and use of PPE;
- a requirement that fume hoods and other protective equipment are functioning properly and specific measures to be taken to ensure proper and adequate functioning of such equipment;
- provisions for employee information and training in accordance with 29 CFR 1910.1450(f);
- the circumstances under which a particular laboratory operation, procedure, or activity shall require prior approval from the employer or the employer's designee prior to implementation;
- provisions for medical consultation and examinations in accordance with 29 CFR 1910.1450(g);
- designation of personnel responsible for implementation of the plan, including assignment of a Chemical Hygiene Officer;
- provisions for additional employee protection for work with particularly hazardous substances (i.e., select carcinogens, reproductive toxins and acutely toxic substances), especially addressing establishment of a designated area of use/handling, use of containment devices (e.g., hoods or glove boxes), procedures for safe removal of contaminated waste, and decontamination procedures; and
- provision for review, evaluation of effectiveness, and update of the plan by the employer at least annually.

A9 Lockout/Tagout for Control of Hazardous Energy Sources for Personnel Safety (Red Lock Procedure) Program

Employers of employees who perform ER Project work and perform servicing or maintenance of machines or equipment in which the unexpected energization or start up of the machine or equipment, or release of stored energy could cause injury to employees, must establish a written lockout/tagout program. This program shall include procedures that comply with the requirements of 29 CFR 1910.147 and with LANL's procedure for Lockout/Tagout for Control of Hazardous Energy Sources for Personnel Safety (Red Lock Procedure)." LP 106-01.2. This includes any activity involving the shutdown or temporary lockout of hazardous energy sources (including electric, mechanical, pneumatic, thermal, hydraulic, chemical, and radioactive), for which a written procedure is required. This program shall provide for:

- training to ensure that the purpose and function of the energy control program are understood by employees;
- at least annual inspection of the energy control procedure to ensure that it is being properly implemented; and
- provision of appropriate hardware and protective materials (e.g., locks, tags, and chains) by the employer for isolating, securing, or blocking of machines or equipment from energy sources.

The procedures shall cover elements and actions (in the stated sequence) including

- preparation for shutdown, including workers being knowledgeable of the type and magnitude of energy, the hazards of the energy to be controlled, and the method or means to control the energy;
- machine or equipment shutdown;
- machine or equipment isolation from the energy source(s);
- lockout/tagout device application;
- relief, disconnection, or restraint from stored energy, and the control of accumulated stored energy;
- machine verification of isolation from the energy source(s);

A10 Medical Surveillance Program

Employers of employees who perform ER Project work must maintain and implement a written medical surveillance program that complies with applicable OSHA and LANL requirements (Section 11).

A11 Personal Protective Equipment

Employers of employees who perform ER Project work while using PPE must maintain and implement a written PPE program that complies with applicable OSHA requirements (Section 7).

A12 Radiation Safety Program

The Subcontractor's Radiation Safety Program and procedures must be approved by the UC per Section 1.2 or the entire LANL Radiation Protection Program shall be implemented. Radiological Work Permits

(RWP's) and other aspects of radiological work conduct must be reviewed and approved by LANL per Section 1.2.3. LANL procedures and forms that must be used include:

- Notification and Reporting of Radiological Incidents,"LP 107-01.0
- Radiological Posting,"LS 107-0 2.2
- Handling Radiological Work Permits,"LP 107-02.1
- Releasing Material and Equipment,"LP 107-04.2
- Operational Checks of Beta/Gamma Survey Instruments,"ESH-1-07-85
- Operational Checks of Alpha Survey Instruments,"ESH-1-07-86
- Responding to External Personnel Contamination,"ESH-1-09-05.3
- Responding to Suspect Internal Personnel Contamination,"ESH-1-09-02.1

In accordance with 10 CFR 835 and the DOE RadCon Manual, the Subcontractors Radiation Safety Program must contain the following elements (which are further described in the referenced sections) along with corresponding procedures for implementation:

- Standards for Internal and External Exposure (Section 6)
10 CFR 835(C); DOE RadCon Manual, Chapter 2, Part 1
- Monitoring in the Workplace (Section 6)
10 CFR 835(E); DOE RadCon Manual, Chapter 5, Part 5
- Entry Control Program (Section 5)
10 CFR 835(F); DOE RadCon Manual, Chapter 3, Part 3
- Posting and Labeling (Section 5)
10 CFR 835(G); DOE RadCon Manual, Chapter 2, Part 3
- Records (i.e., individual and work place monitoring and administrative, (Section 13)
10 CFR 835(H); DOE RadCon Manual, Chapter 7
- Reports to Individuals (Section 13)
10 CFR 835(I); DOE RadCon Manual, Chapter 7, Part 8
- Radiation Safety Training (Section 10)
10 CFR 835(J); DOE RadCon Manual, Chapter 6
- Design and Control (i.e., engineering controls, Section 4)
10 CFR 835(K)
- Release of Material and Equipment from Radiological Areas (i.e., decon, Section 8)
10 CFR 835(L); DOE RadCon Manual, Chapter 3, Part 4
- Accidents and Emergencies (Section 9)
10 CFR 835(N); DOE RadCon Manual, Chapter 3, Appendix 2A

A13 Respiratory Protection Program

Employers of employees who perform ER Project work while using respiratory protective equipment must maintain and implement a written respiratory protection program that complies with applicable requirements (Section 7.1).

A14 Spark/Flame-Producing Operations (Hot Work/Burn Permit)

The DOE Order for "General Operations Quality Assurance" (DOE AL5700.6C) requires process controls for special processes such as welding, heat treating, and steel welding. Accordingly, LANL's administrative requirement AR 8-4, "Welding, Cutting, and Other Spark/Flame-Producing Operations," requires a Special Work Permit for Spark/Flame-Producing Operations (Form ES&H 8-4A) for spark/flame-producing operations that constitute a fire hazard, unless such operations are covered by a LANL SOP or are conducted in areas designed for such operations (e.g., designated welding areas). To initiate LANL's permit process, the Field Unit HS Representative should be notified as soon as it is known that a spark or flame-producing operation will occur. This permit shall be prepared and approval signatures obtained before any spark or flame-producing activity is performed. (Refer also to Section 1.2.3.)

A15 Training Program

Employers of employees who perform ER Project work must maintain and implement a written employee training program that complies with applicable OSHA and LANL requirements (Section 10).

SECRET

PRE-JOB START H&S BRIEFING /

SSHASP ACKNOWLEDGMENT FORM

[illegible]

APPENDIX C

SSHASP MODIFICATION FORM

SSHASP MODIFICATION FORM

Project Title: _____

TA(s): _____ SSHASP No.: _____ Modification No.: _____

Modifications of the SSHASP shall be made per Section 1.3 of the HASP.
Attach to this page the SSHASP modifications.

Comments of the following reviewers have been incorporated as stipulated, or resolved with written record and copy to the respective reviewer.

Preparer _____
(Print Name) (Title/Group) (Signature) (Date)

Review and Approval by:

ER/ HS Representative _____
(Print Name) (Title/Group) (Signature) (Date)

ER/ ESH-1 Representative _____
(Print Name) (Title/Group) (Signature) (Date)

FTL or JS (optional at discretion of FAPL) _____
(Print Name) (Title/Group) (Signature) (Date)

FTM (optional at discretion of FAPL) _____
(Print Name) (Title/Group) (Signature) (Date)

FAPL _____
(Print Name) (Title/Group) (Signature) (Date)

Concurrence by:

Facility Management Unit (FMU) Representative _____
(Print Name) (Title/Group) (Signature) (Date)

Subcontractor Representative (Management or HS Rep.) _____
(Print Name) (Title/Company) (Signature) (Date)

Subcontractor Representative (Management or HS Rep.) _____
(Print Name) (Title/Company) (Signature) (Date)

Subcontractor Representative (Management or HS Rep.) _____
(Print Name) (Title/Company) (Signature) (Date)

APPENDIX D

HIGHLIGHTS OF
MINIMUM ASBESTOS REQUIREMENTS
APPLICABLE AT LANL

HIGHLIGHTS OF MINIMUM EPA and NMED NESHAP ASBESTOS REQUIREMENTS APPLICABLE AT THE LANL

Scope and Application: Facility renovation or demolition (see definitions below). *Note:* If facility is being demolished under order of a State or local government agency, issued because the facility is structurally unsound and in danger of imminent collapse, refer to 40 CFR 61.145(a)(3) for exceptions to the following

<p style="text-align: center;">Renovation Projects Involving: ≥ 260 linear ft. (80 linear meters) or 160 sq. ft. (15 sq. meters) of ACM on facility components, or ≥ 35 cubic ft. (1 cubic meter) ACM off facility components, and All Demolition Projects</p>	<p style="text-align: center;">Renovation Projects Involving: < 260 linear ft. (80 linear meters) or 160 sq. ft. (15 sq. meters) of ACM on facility components, or < 35 cubic ft. (1 cubic meter) ACM off facility components</p>
<ul style="list-style-type: none"> • Contractor Requirements: Contractors must be licensed by the NM Construction Industries Division (phone: 505-827-7030) for asbestos work; also, personnel must meet OSHA training/accreditation requirements per 29 CFR 1926.1101 • Asbestos Inspectors: An Asbestos Inspector certified by an EPA accredited training provider (Appendix C to Subpart E of 40 CFR Part 763) must determine whether ACM is friable, nonfriable, or has potential to become friable. (Note: DOE requires this certification NMED requires a third party industrial hygienist or industry professional familiar with ACM) • NESHAP Notification to NMED under 40 CFR 61.145(b) through ESII-17 (phone: 667-3615 or 667-8855): Written notice of intent to demolition/renovation required at least 10 working days before ACM is disturbed, update notice required when amount of ACM changes by at least 20%; notice of change in new start date must be given by telephone as soon as possible before original start date followed in writing no later than original start date (FAXs not acceptable), otherwise 10 days notice required again • NESHAP Procedures for Emission Control: Compliance with 40 CFR 61.145(c), 150, 151, and 152 	<ul style="list-style-type: none"> • Contractor Requirements: Contractors must be licensed by the NM Construction Industries Division (phone: 505-827-7030) for asbestos work; also, personnel must meet OSHA training/accreditation requirements per 29 CFR 1926.1101 • Asbestos Inspectors: An Asbestos Inspector certified by an EPA accredited training provider (Appendix C to Subpart E of 40 CFR Part 763) must determine whether ACM is friable, nonfriable, or has potential to become friable. (Note: DOE requires this certification NMED requires a third party industrial hygienist or industry professional familiar with ACM) • NESHAP Notification to NMED under 40 CFR 61.145(b) through ESII-17: Depends upon LANL's status under 40 CFR 61.145(a)(4)(iii), contact ESII-17 at 667-3615 or 667-8855 to determine applicability • NESHAP Procedures for Emission Control: Compliance with 40 CFR 61.145(c), 150, 151, and 152
<p>Waste Disposal:</p>	<ul style="list-style-type: none"> • Compliance with 40 CFR 61.145, 150, 151, 152, and 154 • Per 40 CFR 61.150(b)(1),(2) ACW must be deposited at a disposal site operated per 40 CFR 61.154, or at a U.S. EPA approved site that converts RACM-waste into nonasbestos material in accordance with 40 CFR 61.155. This provision is not applicable to Category I nonfriable ACM waste that is not RACM (i.e., that will not become friable), which may be transported to a landfill authorized by the Permitting and Compliance Section of the Solid Waste Board of NMED; contact ESII-17 at 667-3615 or 667-8855 for further information • ACW that also is RCRA hazardous waste (i.e., contaminated by a RCRA listed waste in quantity sufficient to fail the toxicity characteristic leaching procedure) must be handled in accordance with applicable RCRA and 40 CFR 61, Subpart M requirements • ACW that is radiologically contaminated must be disposed of in accordance with requirements of DOE Order 5920.2A, <i>Radioactive Waste Management</i> • ACW that is contaminated by PCBs must be disposed of in accordance with requirements of 40 CFR 761 • A Waste Shipment Record (WSR) must accompany all ACW to an approved landfill, with a copy submitted to ESII-17 at the time of shipment. The WSR must be returned to the waste generator with burial date information within 35 days of the waste leaving the facility site and a copy given to ESII-17.

HIGHLIGHTS OF MINIMUM EPA and NMED NESHA ASBESTOS REQUIREMENTS APPLICABLE AT THE LANL

Definitions:

- **Asbestos-Containing Material (ACM)** = Material containing > 1% asbestos (by polarized light microscopy analytical method)
- **Asbestos-Containing Waste (ACW)** = Any regulated asbestos-containing waste material (RCM), and materials contaminated with asbestos, including disposable equipment and clothing; Note that ACW is not listed as a RCRA hazardous waste in Appendix VIII to 40 CFR 261
- **Category I Nonfriable ACM** = packings, gaskets, resilient floor covering, and asphalt roofing products with > 1% asbestos; these ACM materials can be classified as regulated ACM (RCM) depending upon how they will be handled/treated; refer to RCM definition for further definition
- **Category II Nonfriable ACM** = Any ACM other than Category I ACM that when dry cannot be crumbled, pulverized, or reduced to powder by hand pressure; Category II nonfriable ACM materials can be classified as regulated ACM (RCM) depending upon how they will be handled/treated; refer to RCM definition for further definition
- **Demolition** = Operations in which load-supporting structural members are wrecked or taken out of a facility or the intentional burning of a facility
- **Facility** = Any structure, installation, or building (excluding residential buildings having four or fewer dwelling units, but including single family dwellings operated by a single entity (e.g., military housing)); any ship; and any active or inactive waste site
- **Facility Component** = Any part of a facility including equipment
- **Friable ACM** = Any ACM that when dry can be crumbled, pulverized, or reduced to powder by hand pressure
- **Regulated ACM (RCM)** = ACM regulated by NMED and EPA; includes: friable ACM, Category II nonfriable ACM that has the possibility of becoming friable or damaged during removal, and Category I nonfriable ACM floor covering, mastic, and asphalt roofing materials that will be subject to sanding, grinding, cutting, abrading, crumbling, pulverizing, or reducing to powder during demolition/renovation
- **Restoration** = Altering a facility or facility component in any way

HIGHLIGHTS OF MINIMUM OSHA CONSTRUCTION ASBESTOS REQUIREMENTS APPLICABLE AT THE LANL

Scope and Application: Demolition/salvage of structures where asbestos is present; removal or encapsulation of materials containing asbestos; construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, containing asbestos; installation of products containing asbestos; asbestos spill/emergency clean-up; and transportation, disposal, storage, containment, and housekeeping activities involving asbestos when construction activities are performed.

	Class I Asbestos Operations	Class II Asbestos Operations
Definition paragraph (b)	Removal of thermal system insulation (TSI) and surfacing ACM and PACM	Removal of asbestos which is not thermal system insulation (TSI) or surfacing material (e.g., AC-wallboard, floor tile, sheeting, roofing/siding shingles, construction mastics)
Regulated Area paragraph (c)	Also known as "Exclusion Zone" during HAZWOPER work - Required per paragraph (c)	
Exposure Assessment/Monitoring paragraph (f)	<ul style="list-style-type: none"> • Exposure assessment (EA) by Asbestos Competent Person • Presume exposure > PEL/EL until negative EA produced • 30 min and 8 hr TWA monitoring per 29 CFR 1926.1101 Appendix A; laboratory should participate in the Asbestos Registry sponsored by the AIIA or the Proficiency Analytical Testing (PAT) Program, analysts must have completed NIOSH course for sampling and evaluating airborne asbestos dust • Daily periodic exposure monitoring till negative EA produced unless Level B PPE used • Periodic exposure monitoring whenever change in process, controls, personnel, or work practices may result in PEL/EL 	<ul style="list-style-type: none"> • Exposure assessment (EA) by Asbestos Competent Person • 30 min and 8-hr TWA monitoring per 29 CFR 1926.1101 Appendix A; laboratory should participate in the Asbestos Registry sponsored by the AIIA or the Proficiency Analytical Testing (PAT) Program, analysts must have completed NIOSH course for sampling and evaluating airborne asbestos dust • Daily periodic exposure monitoring until negative EA indicated unless Level B PPE in use
Written Plan/Program	<p>Written documentation shall be submitted to LANL for approval prior to start of any work involving disturbance of ACM or PACM, which meets either of the following requirements:</p> <ul style="list-style-type: none"> - a project-specific exposure assessment, and workplan or SSHASP with corresponding operating procedures detailing means and methods of compliance with applicable requirements of 29 CFR 1926.1101 and any other applicable regulations and requirements; or - a generic Asbestos Management Program supplemented by a project-specific exposure assessment, and workplan or SSHASP with corresponding operating procedures detailing compliance with applicable requirements of 29 CFR 1926.1101 and any other applicable regulations and requirements 	

HIGHLIGHTS OF MINIMUM OSHA CONSTRUCTION ASBESTOS REQUIREMENTS APPLICABLE AT THE LANL

	Class I Asbestos Operations	Class II Asbestos Operations
Engineering Controls/ Work Practices paragraph (g)	<ul style="list-style-type: none"> Supervision by Asbestos Competent Person HEPA vacuums Wet methods Prompt clean-up/disposal of waste in leak-tight containers The control measures listed below are required, unless alternative controls have been certified by a CHH, CSP, or PE (who also is an Asbestos Project Designer) as adequate to: (1) control exposure < PEL/EL under worst-case conditions as demonstrated by objective exposure monitoring data, and (2) to prevent migration of asbestos fibers as measured by clearance or perimeter monitoring per (g)(6)(ii). For work involving more than 10-square or 25-linear feet of ACM, OSHA must be notified of the alternative controls per (g)(6)(iii). For work involving less than 10-square or 25-linear feet of ACM, Class II requirements apply. <ul style="list-style-type: none"> local HEPA exhaust ventilation mini-enclosure impermeable barriers/HVAC isolation use of impermeable dropcloths water spray process system negative pressure enclosure or glove bag or box system Prohibitions: <ul style="list-style-type: none"> dry clean-up employee rotation to reduce exposure compressed air for cleaning unventilated/filtered high speed abrasive disc saws 	<ul style="list-style-type: none"> Supervision by Asbestos Competent Person HEPA vacuums; wet methods Prompt clean-up/disposal of waste in leak-tight containers Indoor jobs: <ul style="list-style-type: none"> isolation by impermeable barriers to prevent migration of asbestos fibers as measured by clearance or perimeter monitoring per (g)(6)(ii) use of impermeable dropcloths The following required unless alternative controls are certified by an Asbestos Competent Person as adequate to control asbestos exposure < PEL/EL under worst-case conditions as demonstrated by objective exposure monitoring data: <ul style="list-style-type: none"> transite siding or shingles - (g)(8)(iii) roofing materials - (g)(8)(ii) vinyl and asphalt flooring materials - (g)(8)(i) asbestos-containing gaskets - (g)(8)(iv) other Class II materials not specified - (g)(8)(v) Prohibitions same as Class I work
Respiratory Protection paragraph (h)	<ul style="list-style-type: none"> Until an exposure assessment (EA) has been produced, a powered air-purifying respirator (PAPR), full facepiece supplied air respirator operated in pressure demand mode equipped with HEPA egress cartridges, or an auxiliary positive pressure SCBA must be worn by personnel performing Class I work involving exposure to asbestos. Once an EA has been produced, appropriate respiratory protection based upon the EA results and in compliance with paragraph (h) must be used by such personnel Respirator fit-testing required every 6-months per 29 CFR 1926.1101 Appendix C 	<ul style="list-style-type: none"> Minimum of half-face air-purifying respirator fitted with HEPA cartridges and fit-testing (every 6-months per 29 CFR 1926.1101 Appendix C) required when negative EA has not been produced Respiratory protection per Table 1 of paragraph (h) and fit-testing (every 6-months per 29 CFR 1926.1101 Appendix C) required when: <ul style="list-style-type: none"> employees are exposed > PEL/EL, wet methods are not used, or ACM is removed while it is not substantially intact, and in emergencies
PPE paragraph (i)	<p>Required when:</p> <ul style="list-style-type: none"> PEL/EL exceeded, or negative EA has not been produced, and during jobs involving > 25 linear or 10 square feet of TSI or surfacing ACM or PACM 	<p>Required when:</p> <ul style="list-style-type: none"> PEL/EL exceeded, or negative EA has not been produced

HIGHLIGHTS OF MINIMUM OSHA CONSTRUCTION ASBESTOS REQUIREMENTS APPLICABLE AT THE LANL

	Class I Asbestos Operations	Class II Asbestos Operations
Hygiene Facilities/ Practices paragraph (j)	<p>Decon area required during jobs involving > 25 linear or 10 square feet of TSI or surfacing ACM or PACM, consisting of:</p> <ul style="list-style-type: none"> • decon/equipment area or room • shower area or room • clean change area or room • HEPA vacuum: personnel, equipment, materials, waste prior to removal from regulated area (EZ) <p>During jobs involving < 25 linear or 10 square feet of TSI or surfacing ACM or PACM - same requirements as for Class II work</p>	<p>Decon area required when exposures exceed PEL/TL or where no negative EA produced, consisting of</p> <ul style="list-style-type: none"> • equipment area or room • HEPA vacuum: personnel, equipment, materials, waste prior to removal from regulated area (EZ)
Communication of Hazards paragraph (k)	<ul style="list-style-type: none"> • Before work subject to this standard is begun, building and facility owners must determine the presence, location, and quantity of ACM and/or PACM at the work site, and must communicate this information in writing to employees, tenants, and to personnel who will work in the area • Employers who discover ACM and/or PACM must notify owner of the presence, location, and quantity of ACM and/or PACM within 24 hours of discovery • Must assume PACM is ACM, unless tested per Subpart E of 40 CFR 763 or 40 CFR 763.86 and shown to contain $\leq 1\%$ asbestos content • Samples must be collected by CII or an Asbestos Inspector • Analysis must be by analytical laboratory successfully participating in nationally recognized testing program (i.e., National Voluntary Laboratory Accreditation Program [NVLAP] or National Institute for Standards and Technology [NIST], or American Industrial Hygiene Association [AIHA]), or equivalent 	
Signs/Postings paragraph (l)	<ul style="list-style-type: none"> • Warning signs must be posted at entrance to regulated area (exclusion zone) stating: "DANGER, ASBESTOS CANCER AND LUNG DISEASE HAZARD, AUTHORIZED PERSONNEL ONLY" • Where use of respirators and/or PPE required, warning sign required: "RESPIRATOR and/or PROTECTIVE CLOTHING REQUIRED IN THIS AREA" 	
Training paragraph (k)	<ul style="list-style-type: none"> • The following required <ul style="list-style-type: none"> - Asbestos Workers - Asbestos Competent Person (Contractor/Supervisor) • The following required if alternative engineering controls will be implemented (see "Engineering Controls" above): <ul style="list-style-type: none"> - CII or PE who also is an Asbestos Project Designer <p>Asbestos Inspector required for collection of bulk suspect-ACM sample</p> <p>All the above personnel are to be trained in compliance with requirements of Appendix C to Subpart E of 40 CFR Part 763</p>	<p>The following required</p> <ul style="list-style-type: none"> • Asbestos Competent Person (Contractor/ Supervisor) • Workers: At least 8 hours of training including elements included in (k)(9)(viii), hands-on training, and work practices and engineering controls in (g)(7) that specifically relate to the category of work, such as: <ul style="list-style-type: none"> - transite siding or shingles (g)(8)(iii) - roofing materials (g)(8)(ii) - vinyl and asphalt flooring materials (g)(8)(i) - asbestos-containing gaskets (g)(8)(iv) - other Class II materials not specified (g)(8)(v) <p>Asbestos Inspector required for collection of bulk suspect-ACM sample</p> <p>All the above personnel are to be trained in compliance with requirements of Appendix C to Subpart E of 40 CFR Part 763</p>

HIGHLIGHTS OF MINIMUM OSHA CONSTRUCTION ASBESTOS REQUIREMENTS APPLICABLE AT THE LANL

	Class I Asbestos Operations	Class II Asbestos Operations
Housekeeping paragraph (l)	The following are required: HEPA vacuuming, wet methods, and prompt clean-up/disposal of waste in sealed, labeled, impermeable, leak-tight containers; no dry dusting or sweeping allowed	
Medical Surveillance paragraph (m)	Required per Section II and Appendix F of the ER Project HASP, and paragraph (m) and Appendices D and E of 29 CFR 1926.1101	
Recordkeeping paragraph (n)	Training, medical, and exposure monitoring: per Section 13 of HASP and 29 CFR 1926.1101(n)	
Inspections by Competent Person paragraph (o)	At least once during each shift, and at any time at employee request	At intervals sufficient to assess whether conditions have changed, and at any reasonable time at employee request

ACM = Asbestos-containing material (> 1% asbestos)

EA = Exposure Assessment

EL = Excursion Limit (30-minute TWA - 1 fiber per cubic centimeter of air)

HEPA = High-Efficiency Particulate Air filter

PACM = Presumed ACM

PEL = Permissible Exposure Limit (8-hr TWA - 0.1 fiber per cubic centimeter of air)

TSI = Thermal system insulation

TWA = Time-weighted average

Competent Person = One who is capable of identifying existing asbestos hazards in the workplace and selecting appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f). In addition, for Class I and Class II work, who is specially trained in a training course which meets the criteria of the EPA Model Accreditation Plan (Appendix C to Subpart E of 40 CFR Part 763) for a Supervisor; and for Class III and Class IV work, who is trained in a manner consistent with EPA requirements for training of local education agency maintenance and custodial staff per 40 CFR 763.92(a)(2).

APPENDIX E

PHYSICIAN CERTIFICATION OF MEDICAL EVALUATION FORM

PHYSICIAN CERTIFICATION OF MEDICAL EVALUATION
COMPLETE PRIOR TO EMPLOYEE BEGINNING ASSIGNMENT AT LANL AND RETURN TO:
Los Alamos National Laboratory, Occupational Medicine Group,
Mail Stop D421, Los Alamos, NM 87545
Phone: 505/667-7890
Fax: 505/665-7879

INFORMATION PROVIDED BY REQUESTING EMPLOYER:

<p style="text-align: center;">EMPLOYER:</p> <p>Name: _____</p> <p>Mailing Address: _____</p> <p>City, State, Zip: _____</p> <p>Phone: _____</p> <p>FAX Number: _____</p>	<p style="text-align: center;">EMPLOYEE:</p> <p>Name: _____</p> <p>DOB: _____</p> <p>SS #: _____</p>		
<p>Description of LANL Job Assignment/Tasks: _____</p> <p>_____</p>			
<p>REQUIRED MEDICAL SURVEILLANCE/CERTIFICATION (SEE APPLICABLE REGULATIONS):</p> <table style="width: 100%;"><tr><td style="vertical-align: top; width: 50%;"><p><input type="checkbox"/> Hazardous Waste operations (29 CFR 1926.65 or 29 CFR 1910.120)</p><p><input type="checkbox"/> Use of personal protective equipment (29 CFR 1910.134 and ANSI Z 88.2)</p><p style="margin-left: 20px;"><input type="radio"/> Air Purifying <input type="radio"/> half <input type="radio"/> full</p><p style="margin-left: 20px;"><input type="radio"/> Supplied Air <input type="radio"/> half <input type="radio"/> full</p><p><input type="radio"/> Self Contained Breath Apparatus (SCBA)</p><p><input type="checkbox"/> Arsenic (29 CFR 1926.1118 (n) or 29 CFR 1910.1018)</p><p><input type="checkbox"/> Asbestos/Beryllium (29 CFR 1926.1101(m) or 29 CFR 1910.1101)</p></td><td style="vertical-align: top; width: 50%;"><p><input type="checkbox"/> Benzene (29 CFR 1926.1128 or 29 CFR 1910.1028)</p><p><input type="checkbox"/> Bloodborne Pathogens (29 CFR 1910.1030(f))</p><p><input type="checkbox"/> Cadmium (29 CFR 1926.1127 or 29 CFR 1910.1027)</p><p><input type="checkbox"/> Formaldehyde (29 CFR 1926.1148 or 29 CFR 1910.1048)</p><p><input type="checkbox"/> High Noise Exposure - hearing protection (29 CFR 1910.95)</p><p><input type="checkbox"/> Lead (29 CFR 1926.62 or 29 CFR 1910.1025)</p><p><input type="checkbox"/> Vinyl Chloride (29 CFR 1926.1117 or 29 CFR 1910.1017)</p><p><input type="checkbox"/> Other _____</p></td></tr></table>		<p><input type="checkbox"/> Hazardous Waste operations (29 CFR 1926.65 or 29 CFR 1910.120)</p> <p><input type="checkbox"/> Use of personal protective equipment (29 CFR 1910.134 and ANSI Z 88.2)</p> <p style="margin-left: 20px;"><input type="radio"/> Air Purifying <input type="radio"/> half <input type="radio"/> full</p> <p style="margin-left: 20px;"><input type="radio"/> Supplied Air <input type="radio"/> half <input type="radio"/> full</p> <p><input type="radio"/> Self Contained Breath Apparatus (SCBA)</p> <p><input type="checkbox"/> Arsenic (29 CFR 1926.1118 (n) or 29 CFR 1910.1018)</p> <p><input type="checkbox"/> Asbestos/Beryllium (29 CFR 1926.1101(m) or 29 CFR 1910.1101)</p>	<p><input type="checkbox"/> Benzene (29 CFR 1926.1128 or 29 CFR 1910.1028)</p> <p><input type="checkbox"/> Bloodborne Pathogens (29 CFR 1910.1030(f))</p> <p><input type="checkbox"/> Cadmium (29 CFR 1926.1127 or 29 CFR 1910.1027)</p> <p><input type="checkbox"/> Formaldehyde (29 CFR 1926.1148 or 29 CFR 1910.1048)</p> <p><input type="checkbox"/> High Noise Exposure - hearing protection (29 CFR 1910.95)</p> <p><input type="checkbox"/> Lead (29 CFR 1926.62 or 29 CFR 1910.1025)</p> <p><input type="checkbox"/> Vinyl Chloride (29 CFR 1926.1117 or 29 CFR 1910.1017)</p> <p><input type="checkbox"/> Other _____</p>
<p><input type="checkbox"/> Hazardous Waste operations (29 CFR 1926.65 or 29 CFR 1910.120)</p> <p><input type="checkbox"/> Use of personal protective equipment (29 CFR 1910.134 and ANSI Z 88.2)</p> <p style="margin-left: 20px;"><input type="radio"/> Air Purifying <input type="radio"/> half <input type="radio"/> full</p> <p style="margin-left: 20px;"><input type="radio"/> Supplied Air <input type="radio"/> half <input type="radio"/> full</p> <p><input type="radio"/> Self Contained Breath Apparatus (SCBA)</p> <p><input type="checkbox"/> Arsenic (29 CFR 1926.1118 (n) or 29 CFR 1910.1018)</p> <p><input type="checkbox"/> Asbestos/Beryllium (29 CFR 1926.1101(m) or 29 CFR 1910.1101)</p>	<p><input type="checkbox"/> Benzene (29 CFR 1926.1128 or 29 CFR 1910.1028)</p> <p><input type="checkbox"/> Bloodborne Pathogens (29 CFR 1910.1030(f))</p> <p><input type="checkbox"/> Cadmium (29 CFR 1926.1127 or 29 CFR 1910.1027)</p> <p><input type="checkbox"/> Formaldehyde (29 CFR 1926.1148 or 29 CFR 1910.1048)</p> <p><input type="checkbox"/> High Noise Exposure - hearing protection (29 CFR 1910.95)</p> <p><input type="checkbox"/> Lead (29 CFR 1926.62 or 29 CFR 1910.1025)</p> <p><input type="checkbox"/> Vinyl Chloride (29 CFR 1926.1117 or 29 CFR 1910.1017)</p> <p><input type="checkbox"/> Other _____</p>		

TO BE COMPLETED BY THE EVALUATING PHYSICIAN:

<p>Date Medical Evaluation Completed: _____</p>	
<p>Work Restrictions Identified? <input type="checkbox"/> No <input type="checkbox"/> Yes (Describe) _____</p> <p>_____</p>	
<p><input type="checkbox"/> I have completed a medical evaluation of this employee and he/she is MEDICALLY CLEARED to perform the job tasks as outlined above with restrictions (if any) as noted. The employee is physically fit to wear the required protective equipment including respirators as identified above. I have explained the results of this evaluation to the employee and have advised him/her of any medical conditions that require further examination or treatment.</p>	
<p>Examining Physician Signature: _____</p> <p>Physician Name (typed): _____</p> <p>Date: _____</p>	<p>Mailing Address: _____</p> <p>Phone No. _____</p> <p>FAX No. _____</p>
<p>OR</p>	
<p><input type="checkbox"/> I have completed a medical evaluation of this employee and I am UNABLE TO MEDICALLY CLEAR this employee to perform the job tasks as outlined above. I have explained the results of this evaluation to the employee and have advised him/her of any medical conditions that require further examination or treatment.</p>	
<p>Examining Physician Signature: _____</p> <p>Physician Name (typed): _____</p> <p>Date: _____</p>	<p>Mailing Address: _____</p> <p>Phone No. _____</p> <p>FAX No. _____</p>

SECRET

1

MEDICAL SURVEILLANCE REQUIREMENTS AND FREQUENCIES

Medical surveillance requirements are regulated by several OSHA standards, which are identified in this table together with the corresponding action levels triggering the requirements, the required medical surveillance, and the frequencies of surveillance. In accordance with this table and Section 11 of the HASP, site-specific medical surveillance requirements shall be specified in Section 11 of the SSHASP.

- ER Project work involving hazardous waste operations regulated by OSHA under 29 CFR 1926.65
- Substance(s) included in Table 2 of the HASP (Section 4.2.2.4), which are considered of occupational health concern in the hazard assessment (Table 4-2 of the SSHASP) are regulated under applicable OSHA standard(s) in Subparts D and Z of 29 CFR 1926
- Hearing conservation program requirements per 29 CFR 1910.95 and Sections 4.2.2.7 and 11 of the HASP.
- Respiratory protection program requirements per 29 CFR 1910.134 and Sections 7.1 and 11 of the HASP.

Hazard	Action Level	Minimum Requirements	Frequency
Hazardous Waste Operations - General	Potential for exposure to hazardous substances or health hazards 2 PELs or published exposure limits while performing HAZWOPER work	29 CFR 1926.65(n), 29 CFR 1910.120, and Section 11 of the HASP • The physician shall be provided a copy of 29 CFR 1926.65 and Section 11 of the HASP • Medical and work history (or update if already on file) especially emphasizing symptoms related to hazardous substances and health hazards • Physical examination <ul style="list-style-type: none"> • Blood chemistry • Complete blood count (CBC) • Pulmonary function tests (FVC and FEV1) • Heavy metal screen (as appropriate(s) below) • Evaluation of stresses related to repetitive motion • Vital signs • Eye examination • Audiogram • EKG • Urinalysis • Evaluation of ability to wear PPE under conditions anticipated at work site(s)	Refer to LAM ER Project HASP Section 11. • Baseline: Within first 30 days of HAZWOPER field work • Annual: At least once every 12 months, unless examining physician believes shorter or longer frequency is needed or required • Periodic: Per Section 11 of the LAM ER Project HASP
Arsenic (inorganic)	> 5 mg/M ³	29 CFR 1926.1118(n), 29 CFR 1910.1018, and Section 11 of the HASP • Physician shall be provided copy of 29 CFR 1926.1118 and Section 11 of HASP • Medical history, to include smoking history and presence and degree of respiratory symptoms (e.g., breathlessness, cough, sputum production, wheezing) • General medical evaluation per requirements under hazardous waste operations, plus: <ul style="list-style-type: none"> - 14" by 17" (35.56 x 43.18 cm) posterior-anterior chest X-ray and International Labor Office (ILO/Cincinnati) (ILO/CIN) rating - Sputum cytology examination - Any other examination or test relevant to arsenic exposure deemed appropriate by examining physician to complete written medical opinion 	At least annually for employees who are < 45 years of age with > 10 years of exposure to arsenic above the action level. At least semi-annually for other employees exposed above the action level. Upon termination of employment, whenever an employee covered by this requirement has not been examined within six months prior to termination of employment. Whenever an employee develops signs or symptoms commonly associated with exposure to inorganic arsenic.

MEDICAL SURVEILLANCE REQUIREMENTS AND FREQUENCIES			
Hazard	Action Level	Minimum Requirements	Frequency
<p>Asbestos</p> <p>Beryllium</p>	<p>≥ 0.05 f/cc</p> <p>$> 0.5 \text{ mg/m}^3$</p>	<p>Asbestos - 29 CFR 1926.1101(m), 29 CFR 1910.1101, and Section 11 of the HASP</p> <p>Beryllium - LAHL AR 6-7 and TB 607</p> <ul style="list-style-type: none"> Physician shall be provided copy of 29 CFR 1926.1101 or LAHL AR 6-7, and Section 11 of HASP Medical and work history emphasizing pulmonary, cardiovascular, and gastrointestinal systems Standardized questionnaire contained in Appendix D of 29 CFR 1926.58 (Part 1 for initial baseline exam, Part 2 for annual exam) General medical evaluation per requirements under hazardous waste operations, plus: <ul style="list-style-type: none"> chest X-ray administered at discretion of physician; interpretation and classification of chest X-rays according to Appendix E of 29 CFR 1926.58 Any other exam or test relevant to asbestos or beryllium exposure deemed necessary by examining physician 	<p>When employee will work where asbestos may be at Action Level, within first 40 days of initial job assignment and at least annually thereafter as long as such exposure continues, or more frequently if specified by examining physician</p>
Occupational Exposure to Bloodborne Pathogens (see Section 9.3.1.3)	Any occupational exposure	<p>29 CFR 1910.1030(j) and Section 11 of the HASP</p> <p>Physician shall be provided copy of 29 CFR 1910.1030 and Section 11 of HASP</p> <p>Medical evaluations and procedures shall be provided according to recommendations of U.S. Public Health Service, Center for Disease Control and Prevention current when evaluations and procedures occur</p> <p>Employees Having Occupational Exposure Potential</p> <p>Hepatitis B vaccine and vaccination series shall be offered by employer to employees who have occupational exposure potential. Employer shall assure that employees who decline to accept hepatitis B vaccination offered by employer sign statement in Appendix A of standard.</p>	<p>Employees Having Occupational Exposure Potential</p> <p>Hepatitis B vaccination shall be offered to employee within 10 working days of initial assignment, unless employee has previously received complete hepatitis B vaccination series, antibody testing has revealed employee is immune, or vaccine is contraindicated for medical reasons. If employee declines hepatitis B vaccination but later while still covered under standard decides to accept vaccination, employer shall make vaccination available then.</p> <p>Post-Exposure Evaluation and Follow-up:</p> <p>Immediately following report of exposure incident</p>

MEDICAL SURVEILLANCE REQUIREMENTS AND FREQUENCIES

Hazard	Action Level	Minimum Requirements	Frequency
Benzene	≥ 0.5 ppm	<p>29 CFR 1226.1128(i), 29 CFR 1310.1028, and Section 11 of the HASP</p> <ul style="list-style-type: none"> Physician shall be provided copy of 29 CFR 1226.1128 and Section 11 of HASP Medical and work history, with particular attention to: <ul style="list-style-type: none"> Past work exposure to benzene or any other hematological toxins Family history of blood dyscrasias including hematological neoplasms History of: <ul style="list-style-type: none"> renal or liver dysfunction medications blood dyscrasias including genetic hemoglobin abnormalities, bleeding abnormalities, and abnormal function of formed blood elements previous exposure to ionizing radiation exposure to marrow toxins outside of current work situation General medical evaluation per requirements under hazardous waste operations Any additional tests relevant to benzene exposure deemed necessary by the examining physician <p>NOTE: Immediately following each occasion an employee is removed from exposure to benzene because of hematological findings pursuant to paragraphs (i)(8)(i) & (ii), the employer shall provide the employee with six months of medical removal protection benefits according to paragraph (i)(9)</p>	<p>Prior to initial assignment and at least annually thereafter whenever employee works where benzene exposure ≥ Action Level. Initial examination not required if employee records show employee has been examined according to requirements within past 12 months. Whenever employee develops symptoms commonly associated with toxic exposure to benzene</p> <p>Emergency Examinations</p> <p>Whenever an employee is exposed to benzene during an emergency situation, if results ≥ 75 mg phenol per liter, complete blood count shall be done (similar to Initial Examination) at monthly intervals for a duration of three months following the emergency</p> <p>Additional Examination and Referrals</p> <p>Blood count shall be repeated within two weeks whenever:</p> <ul style="list-style-type: none"> Hemoglobin level or hematocrit fall below normal limit (outside 95% confidence interval [CI]), as determined by the lab for the particular geographic area and/or these indices show persistent downward trend from employee's pre-exposure norms (providing findings cannot be explained by other medical reasons) Thrombocyte (platelet) count varies more than 20% below employee's most recent values or falls outside normal limit (95% CI) as determined by the lab Leukocyte count below 4,000 per mm³ or an abnormal differential count <p>If abnormality persists, examining physician shall refer employee to hematologist or internist or further evaluation (per paragraphs (i)(5)(ii) & (iv)) unless examining physician has good reason to believe such referral is unnecessary. When physician makes referral to hematologist/internist, employee shall be removed from areas where exposure to benzene may exceed action level, until such time as physician determines according to (i)(8)(ii)</p>

MEDICAL SURVEILLANCE REQUIREMENTS AND FREQUENCIES			
Hazard	Action Level	Minimum Requirements	Frequency
Cadmium	$\geq 25 \text{ mg/M}^3$ and all employees performing tasks involving cadmium (e.g., brazing, burning, curing, painting, welding)	<p>29 CFR 1926.1127(j), 29 CFR 1910.1027, and Section 11 of the HASP</p> <ul style="list-style-type: none"> Physician shall be provided copy of 29 CFR 1926.1127 and Section 11 of HASP Medical and work history emphasizing past, present and anticipated future exposure to cadmium; any history of renal, cardiovascular, respiratory, hematopoietic, reproductive, and/or musculo-skeletal system dysfunction; current usage of medication with potential nephrotoxic side effects; and smoking history and current status General medical evaluation per requirements under hazardous waste operations, plus: <ul style="list-style-type: none"> Cadmium in urine (CdU) standardized to grams of creatinine (g Cr) Beta 2 microglobulin in urine (b₂M) standardized to grams of creatinine (g Cr) with pH specified per Appendix F of 29 CFR 1926.1127 Cadmium in blood (CdB) standardized to liters of whole blood (Lb) 11" by 17" posterior-anterior chest X-ray (frequency to be determined by examining physician) For males > 40 years of age, prostate palpation or other at least as effective diagnostic test Any additional tests or procedures relevant to cadmium exposure deemed appropriate by examining physician <p>Termination of Employment Examination: Per paragraph (j)(8) of the standard</p> <p>NOTE: Collection and handling of biological samples of cadmium in urine (CdU), cadmium in blood (CdB), and beta 2 microglobulin in urine (b₂M) taken from employees is done in a manner that assures reliability and that analyses are performed by a proficient laboratory (refer to Appendix F of standard)</p>	<p>Initial Examination: When employee will work where cadmium may be \geq Action Level, within first 30 days of initial job assignment. Initial exam not required if adequate records show employee has been examined according to requirements within past 12 months.</p> <p>Action Triggered by Results of Medical Examination:</p> <ul style="list-style-type: none"> Take actions according to paragraph (j)(5) of standard <p>Action Triggered by Results of Biological Monitoring:</p> <p>CdU $\leq 3 \text{ mg/g Cr}$, b₂M $\leq 300 \text{ mg/g Cr}$, and CdB $\leq 5 \text{ mg/Lb}$:</p> <ul style="list-style-type: none"> Periodic medical exam and biological monitoring within 12 months after initial exam; and thereafter, medical exam at least biennially and biological monitoring at least annually <p>CdU > 3 mg/g Cr, b₂M > 300 mg/g Cr, and CdB > 5 mg/Lb:</p> <ul style="list-style-type: none"> Take actions according to paragraph (j)(3)(ii), possibly including medical removal from work where exposure to cadmium is excessive (per paragraphs (j)(11) & (12)) <p>CdU > 15 mg/g Cr, b₂M > $1,500 \text{ mg/g Cr}$, and CdB > 15 mg/Lb through the year 1998, and CdU > 7 mg/g Cr, b₂M > 750 mg/g Cr, and CdB > 10 mg/Lb as of the year 1999:</p> <ul style="list-style-type: none"> Take actions according to paragraph (j)(3)(ii), possibly including medical removal from work where exposure to cadmium is excessive (per (j)(11) & (12)) <p>Termination of Employment Exam: Upon termination of employment, whenever employee covered by requirement has not been examined within 6 months prior to termination of employment</p> <p>Emergency Examination: As soon as possible for any employee who may have been acutely exposed to cadmium</p> <p>Multiple Physician Review: If examining physician was selected by employer, employee has right to designate a 2nd physician to review any finding, determinations, or recommendations of initial examining physician; and to conduct such examinations, consultations, and laboratory tests as 2nd physician deems necessary for review.</p>

MEDICAL SURVEILLANCE REQUIREMENTS AND FREQUENCIES

Hazard	Action Level	Minimum Requirements	Frequency
Formaldehyde	≥ 0.5 ppm	<p>29 CFR 1926.1143(f), 29 CFR 1910.1043, and Section 11 of the HASP</p> <ul style="list-style-type: none"> The physician shall be provided a copy of 29 CFR 1926.1143 and Section 11 of the HASP Medical and work history designed to elicit information on work history, smoking history, any evidence of eye, nose, or throat irritation, chronic airway problems or hyperactive airway disease, allergic skin conditions or dermatitis and upper or lower respiratory problems General medical evaluation per requirements under hazardous waste operations, emphasizing evidence of irritation or sensitization of skin and respiratory system, shortness of breath, or irritation of eyes Any other test relevant to formaldehyde exposure deemed necessary by examining physician to complete the written opinion 	<p>Medical Disease Questionnaire: Prior to assignment to work where action level of formaldehyde is reached and annually thereafter</p> <p>Medical Examination: At the time of initial assignment to work where action level of formaldehyde may be met or exceeded and annually thereafter, for any employee the physician feels (based upon evaluation of the Medical Disease Questionnaire) may be at increased risk from exposure to formaldehyde</p> <p>Emergency Exposures: Any employee who has been exposed to formaldehyde in an emergency</p>
Hearing Protection	≥ 85 dBA (nonLaboratory personnel) ≥ 80 dBA (Laboratory personnel)	<p>29 CFR 1910.95(g) and Sections 4.2.2.7 and 11 of the HASP</p> <ul style="list-style-type: none"> The physician shall be provided a copy of 29 CFR 1910.95 and Section 11 of the HASP <p>Audiogram per Appendix C of 29 CFR 1910.95</p>	Baseline (within 6 months of initial exposure at or above Action Level) and annually thereafter
Lead	≥ 30 mg/M ³	<p>29 CFR 1926.62(g), 29 CFR 1910.1025, and Section 11 of the HASP</p> <ul style="list-style-type: none"> Physician shall be provided copy of 29 CFR 1926.62 and Section 11 of HASP Medical and work history emphasizing past lead exposure, smoking, hygiene, and past gastrointestinal, hematologic, renal, cardiovascular, reproductive and serological problems General medical evaluation per requirements under hazardous waste operations, plus: <ul style="list-style-type: none"> Thorough examination with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, neurological and pulmonary systems Blood sample and analyses for: <ul style="list-style-type: none"> Blood lead level Red cell indices Zinc protoporphyrin Examination of peripheral smear morphology Any lab or other test relevant to lead exposure deemed necessary by examining physician <p>Biological Monitoring</p> <ul style="list-style-type: none"> Blood sampling and analysis for lead and zinc protoporphyrin 	<p>Medical Examinations/Consultations:</p> <p>When employee may be exposed \geq Action Level, at least annually for any employee whose blood lead level at any time during the preceding 12 months was ≥ 40 mg/dl</p> <p>As soon as possible whenever employee has developed symptoms commonly associated with lead intoxication, employee desires medical advice concerning effects of lead exposure on ability to procreate a healthy child, employee is pregnant, or has exhibited difficulty in breathing during respirator fit test or use</p> <p>Biological Monitoring:</p> <p>If employee exposed \geq Action Level, or may be exposed \geq Action Level, and if last blood analysis indicated ≥ 40 mg/dl, at least every two months until two consecutive blood samples and analyses indicate blood lead level < 40 mg/dl</p> <p>If employee may be exposed \geq Action Level, at least every two months for the first 6 months and every 6 months thereafter</p>

MEDICAL SURVEILLANCE REQUIREMENTS AND FREQUENCIES			
Hazard	Action Level	Minimum Requirements	Frequency
Methylene Chloride		<p>29 CFR 1926.</p> <p>Exposure at or above the action level for 30 days or more per year, or above the TWA PEL or the STEL for 10 or more days per year.</p> <p>Above the 8-TWA PEL or STEL or any time period where the individual employee has been identified as being at risk from cardiac disease or some other serious MC-related health condition and sick employee requests inclusion in the program.</p> <p>During an emergency</p>	<p>Time of initial assignment.</p> <p>For employees 45 years of age or older, within 12 months of initial surveillance or any subsequent medical surveillance.</p> <p>For employees younger than 45 years of age, within 36 months of initial surveillance or any subsequent medical surveillance.</p>
Respiratory Protection	Use of a respirator	<p>29 CFR 1910.134, 1910.101, ANSI Z88.2, and per Sections 7.1 and 11 of the HASP</p> <p>Physician shall be provided copy of 29 CFR 1910.134 and Section 11 of HASP</p> <p>General medical evaluation per requirements under hazardous waste operations.</p> <p>Any other test deemed necessary by examining physician to complete the written opinion</p>	Annually, as applicable
Vinyl Chloride	> 0.5 ppm	<p>29 CFR 1926.1117(a), 29 CFR 1910.1017, and Section 11 of the HASP</p> <ul style="list-style-type: none"> The physician shall be provided a copy of 29 CFR 1926.1117 and Section 11 of the HASP Medical and work history emphasizing: <ul style="list-style-type: none"> - Alcohol intake - Past history of blood transfusions - Past history of hepatitis - Past history of hospitalization - Work history and past exposure to potential hepatotoxic agents, including drugs and chemicals General medical evaluation per requirements under hazardous waste operations with specific attention to detecting enlargement of liver, spleen or kidneys, or dysfunction of these organs, and for abnormalities in skin, connective tissues and pulmonary system (refer to Appendix A of this standard) Any other test relevant to vinyl chloride exposure deemed necessary by examining physician to complete the written opinion <p>Lab analyses shall be performed by laboratory licensed under 42 CFR Part 74</p> <p>A statement of employee's suitability for continued exposure to vinyl chloride including use of PPE and respirators shall be obtained from examining physician promptly after examination; a copy shall be provided to the employee</p>	<p>At the time of initial assignment and:</p> <ul style="list-style-type: none"> Every 6 months for employees who have been employed in vinyl chloride or polyvinyl chloride manufacturing for ≥ 10 years Annually for all others <p>Each employee exposed to an emergency involving vinyl chloride exposure</p>

100-200000-100

APPENDIX G

GENERAL FIELD OPERATION HAZARDS

TABLE 1
GENERAL FIELD OPERATION HAZARDS

Hazard	Hazard Assessment	Signs/Symptoms of Exposure & Detection Methods	Response Actions & Protective Measures
BIOLOGICAL HAZARDS			
RODENT FLEA BITES			
Plague	Minor to Imminent	2 to 6 days after flea bite symptoms develop such as: fever, headache, muscle aches and possibly enlarged lymph nodes in armpit(s) or groin; death may occur unless early treatment with antibiotic medicine is obtained.	Plague is spread by infected fleas living on rodents (e.g., chipmunks, field mice, prairie dogs, ground squirrels, etc.) Avoid contact with wild rodents and their nests or burrows. Spray skin with insect repellent containing DEET. Seek medical attention if flea bite is detected during or immediately following field work or when symptoms are noticed, especially if a fever develops. Report occupational exposure to flea bites to SSO, or the FTL or JS, and to employer within 24 hours of development of symptoms, and seek medical attention per Section 9.3.1.
Hanta Virus	Minor to Imminent	Within 24 hours of exposure symptoms develop such as: fever, muscle aches and at least one of the following: cough, headache or pink-eye, and eventually difficulty breathing - which progressively gets worse. Death occurs soon after onset of pneumonia unless emergency treatment by a physician is obtained.	Hanta Virus is spread by contact with urine, saliva or feces of infected field mice (deer mice and possibly other types). Avoid contact with field mice and their nests, bedding, urine, saliva or feces. Seek medical attention if flea bite is detected during or immediately following field work or when symptoms are noticed, especially if a fever develops. Report occupational exposure to flea bites to SSO, or the FTL or JS, and to employer within 24 hours of development of symptoms, and seek medical attention per Section 9.3.1.

1 Key to hazard assessment ratings:

Hazard Severity	Hazard Probability			
	Likely to Occur	Probably will Occur	Possibly could Occur	Unlikely to Occur
Catastrophic (i.e., death or life threatening injury from a single encounter)	Imminent	Imminent	Serious	Minor
Major (i.e., significant injury/illness - resulting in irreversible harm)	Imminent	Serious	Moderate	Minor
Minor (i.e., injury/illness resulting in reversible harm and not likely to threaten mobility or vision)	Serious	Moderate	Minor	Negligible
Negligible	Minor	Minor	Negligible	Negligible

Hazard	Hazard Assessment	Signs/Symptoms of Exposure & Detection Methods	Response Actions & Protective Measures
BLOODBORNE PATHOGENS & INFECTIOUS BODY FLUIDS			
Hepatitis B virus (HBV)	Serious	Hepatitis B is a viral infection, which can cause death in 1 to 2% of patients. Most people with Hepatitis B recover completely while others may become chronic carriers of the virus. Most carriers have no symptoms, while others may develop chronic active hepatitis and cirrhosis. HBV may also be a causative factor in development of liver cancer.	<p>Anyone rendering first aid or CPR to someone may be at risk of exposure to Hepatitis B Virus (HBV), Human Immunodeficiency Virus (HIV), and other less common illnesses. These viruses (pathogens) are transmitted when blood or body fluid of an infected individual comes in direct contact with the aid provider by needle skin puncture, (e.g., needle stick) or by contact through an opening in the skin - eyes, nose, ears, mouth, skin lesion, or cracked, cut or abraded skin.</p> <p>Personnel should avoid contact with another person's blood or body fluids, unless they have been trained according to Section 4.2.2.2 and 9.3.1. Report any occupational exposure incident to the SSO, or the FTL or JS, immediately, and seek medical attention per Section 9.3.1.</p>
Human Immunodeficiency Virus (HIV)	Serious	HIV attacks the body's immune system, causing Acquired Immune Deficiency Syndrome (AIDS). A person infected with HIV may carry the virus without developing symptoms for several years but will eventually develop AIDS. Some carriers may suffer from flu-like symptoms, fever, diarrhea, and fatigue and may develop AIDS-related illnesses including neurological problems, cancer and other opportunistic infections.	
INSECT OR SNAKE (e.g., spider) BITES or STINGS	Negligible to Moderate	To the extent possible, avoid contact with snakes and insects. Do not hike alone or at night. Walk on cleared trails. Avoid stepping or reaching into poorly visible or dark areas. Wear boots.	If bitten or stung, stay calm... the majority of snake or insect bites are not life-threatening. Keep bitten extremity below heart level and avoid unnecessary movement of extremity. Provide victim with first aid and transport for medical attention immediately per Section 9.3.1.2. Have the victim avoid strenuous exertion which might increase spread of venom. Do not apply ice directly to wound. Do not apply tourniquet or constriction bandage to extremity. Report occupational exposure to bites to SSO, or the FTL or JS, and to employer within 24 hours of development of symptoms, and seek medical attention per Section 9.3.1.2.
POISON IVY	Negligible to Minor	A few hours to several days after exposure symptoms develop such as burning, itching skin rash, characterized by redness, blistering and swelling	To the extent possible, avoid contact with poison ivy. Keep skin covered (e.g., wear long pants and long sleeved shirts). If rash develops, the primary treatment is aimed at relief of itchiness; more harm is done by scratching irritated skin than by the actual rash. Report occupational exposure to poison ivy to SSO, or the FTL or JS, and to employer within 24 hours of development of symptoms, and seek medical attention per Section 9.3.1.2.

Hazard	Hazard Assessment	Signs/Symptoms of Exposure & Detection Methods	Response Actions & Protective Measures
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TICK BITES

Ticks are plentiful in the forests of Northern New Mexico and many may carry infectious bacteria/disease. Tick bites can result in human infection which could lead to the development of diseases such as those listed below. These diseases may be fatal or severely debilitating without proper antibiotic therapy.

Lyme Disease	Minor (uncommon in NM)	Onset: rash (can appear several days to weeks after tick bite) appearing like a "bull's eye" - an expanding red circle around a light area, frequently with a small welt in the center; flu-like chills, fever, headache, dizziness, fatigue, stiff neck, joint, or bone pain; can ultimately result in chronic debilitating illness	Wear clothing to cover skin. Ticks tend to crawl upwards. To make skin contact difficult - tuck pant legs into socks or boots, and tuck shirt into pants. Spray clothing with insect repellent containing permethrin or permethrin; spray skin with insect repellent containing DEET. Tick-borne diseases can be avoided by searching body (especially joint areas) for ticks every 3 to 4 hours (after each shift) while moving through tick infested areas (areas with vegetation such as bushes, tall grass or brush). Shower as soon as possible after field work has concluded for the day.
Rocky Mountain Spotted Fever	Minor (uncommon in NM)	Onset of symptoms is abrupt appearing 3 to 10 days after bite, including inflammation/rash appearing like many red spots under the skin, severe headache, chills, exhaustion, and muscular pains; fever reaches 103°F to 104°F within several days and remains high, though morning remissions may occur, and unproductive, harassing cough develops Without early antibiotic therapy could result in death	Remove a tick using tweezers to gently and steadily pull it out of the skin so that its mouth/pincers do not remain in the skin. AVOID CRUSHING THE TICK WHILE REMOVING IT; DO NOT USE A MATCH OR CHEMICAL SUBSTANCE TO GET THE TICK TO BACK OUT OF THE SKIN OR TO KILL IT IN PLACE - THIS MAY CAUSE IT TO RELEASE THE TOXIC BACTERIA INTO THE SKIN. After removing tick, wash hands thoroughly with soap and water. Disinfect wound with antiseptic and bandage. Save the tick by placing in a sample jar; provide to physician if medical attention needed. Seek medical attention per Section 9.3.1.2 if tick observed imbedded in skin and symptoms occur such as: a peculiar rash, fever, muscle aches, flu-like chills, headache, dizziness, fatigue, stiff neck, and/or bone pain; and in advanced cases may include: arthritis, heart rhythm problems and nervous system problems. Report occupational exposure to tick bites to SSO, or the FTL or JS, and to employer within 24 hours of noticing bite or symptoms.

Hazard	Hazard Assessment	Signs/Symptoms of Exposure & Detection Methods	Response Actions & Protective Measures
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PHYSICAL HAZARDS

LIGHTNING STRIKES

Serious to Potentially Imminent

In canyons, listen for thunder.

Elsewhere, watch for lightning and listen for thunder; count the number of seconds between seeing lightning and hearing thunder

The occurrence of lightning strikes in Los Alamos is a very real likelihood, especially during summer months (Section 2.2.8). Plan to work earlier in the day during monsoon season, since most storms occur during the afternoon. If electrical storm is visible/audible within 3 miles (15 seconds) begin shutting down operations; within 2 miles (10 seconds) discontinue site operations, get away from any metal objects and grounding system components (e.g., electrical power substations and large buildings) and take cover in a vehicle or small dwelling. Do not remain upright in an open area or seek shelter near a tall upright object, e.g., a tree. If someone is injured by lightning notify the SSO, or the FTL or JS, and take appropriate action per Section 9.3.

HEAT STRESS

Heat disorders are potentially significant hazards during the summer months. Each individual's capacity to deal with heat is very different; conditions that may be very tolerable for one person may not be tolerable to another. The high altitude and semiarid climate of Los Alamos places additional stress on a worker's body (Section 2.2.2), especially when impervious protective clothing and/or respirators are worn. People can pass from a minor stage of heat stress to a life-threatening stage without much notice of symptoms of interim stages of heat stress. Take steps to reduce the potential for heat disorders (e.g., allowing for acclimation, replacing lost body fluids, implementing work schedules with built-in rest periods, implementing buddy monitoring, and carefully selecting protective clothing). Administrative and engineering controls and monitoring methods shall be indicated in Table 4-3 and Section 6 of the SSHASP. Refer to the "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities" or the "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices" (Section 14) for further guidance.

Heat Rash	Negligible to Minor	Reddish rash on skin surface	Limit exposure to heat or humid air
Heat Cramps	Minor to Moderate	Muscle spasms, pain in hands, feet, and/or abdomen	Limit exposure to heat or humid air, replace electrolytes by drinking Gatorade or equivalent
Heat Exhaustion	Moderate to Serious	Pale, cool, moist skin, heavy sweating, dizziness, nausea, and fainting	Take shelter from sunlight and heat (e.g., in a cooler vehicle or structure, or under a tarp or canopy located in the SZ, or as needed in the EZ and/or CRZ). Loosen clothing, place victim in seated position with head between legs, and have victim drink cool (not cold) water (-8 oz. every 15-20 min); notify the SSO, or the FTL or JS, immediately and seek medical attention per Section 9.3.1.2.
Heat Stroke	Serious to Potentially Imminent	Red hot, usually dry skin, lack of or reduced perspiration, nausea, dizziness and confusion, strong, rapid pulse, and coma THIS IS A LIFE-THREATENING ILLNESS.	Take shelter from sunlight and heat (e.g., in a cooler vehicle or structure, or under a tarp or canopy located in the SZ, or as needed in the EZ and/or CRZ). Loosen constrictive clothing, and immediately cool victim's body by drenching in cool (not cold) water and fan the victim, since evaporation is the best means of cooling; notify the SSO, or the FTL or JS, immediately and seek medical attention for life-threatening illness immediately per Section 9.3.1.1.

Hazard	Hazard Assessment	Signs/Symptoms of Exposure & Detection Methods	Response Actions & Protective Measures
COLD STRESS Cold injuries are significant hazards during the winter months. The cold ambient temperatures and wind chill are significant risk factors during the winter months (Section 2.2.2 and 2.2.8), which place field workers at a high risk of exposure to cold injuries. Worker susceptibility to cold injuries is increased by dehydration; exhaustion, hunger, impaired consciousness, anemia, impaired circulation due to cardiovascular disease, and wet or inadequate clothing. Several steps can be taken to reduce the potential for cold injuries such as, careful selection of protective clothing i.e. insulated body covers, boots, gloves and head covering, keep protective clothing dry, protect workers against wetting and wind, consumption of ample fluids and food, implementing work schedules with built in rest periods, and implementing buddy monitoring. Administrative and engineering controls and monitoring methods shall be indicated in Table 4-3 and Section 6 of the SSHASP. Refer to the "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities" or the "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices" (Section 14) for further guidance.			
Frostnip	Negligible to Minor	Frostnip occurs with exposures to damp cold temperatures (around freezing). Symptoms are firm, cold, white areas on face, ears or extremities. Peeling or blistering may occur in 24-72 hours, and occasionally mild hypersensitivity to cold persists.	Limit exposure to damp cold temperatures. Warm affected area with an unaffected hand or a warm object. Notify the SSO, or the FTL or JS, of occupational occurrence of frostnip, and if appropriate, seek medical attention per Section 9.3.1.2.
Immersion Foot ("Trench foot")	Minor to Moderate	Trench foot occurs with exposures to damp cold temperatures near freezing. Symptoms are pale swollen, clammy, cold, and numb extremity; tissue infection is likely. Increased sweating, pain and hypersensitivity to temperature change may persist for years.	Limit exposure to damp cold temperatures (e.g., put on dry socks when socks become damp). Warm affected area with an unaffected hand or a warm object. Notify the SSO, or the FTL or JS, and immediately seek medical attention per Section 9.3.1.2.
Frost bite	Moderate to Serious	Frost bite occurs with exposures to dry cold temperatures well below freezing. Symptoms are cold, hard, white, and numb areas, which on warming become blotchy red, swollen, and painful. Areas may recover normally or deteriorate to soft wet gangrene or black dry gangrene.	Take shelter from cold temperatures (e.g., in a heated vehicle or structure). Frostbitten extremities should be warmed rapidly by using warm not hot water (102°F - 108°F), snuggling with a warm companion, or warming hand or feet against a warm abdomen or armpit. Give victim warm drinks. Notify the SSO, or the FTL or JS, and immediately seek medical attention per Section 9.3.1.2.
Hypothermia	Serious to Potentially Imminent	Hypothermia occurs with exposures to dry cold temperatures well below freezing. The body cannot sustain normal temperature causing symptoms of lethargy, clumsiness, mental confusion, irritability, slowed or arrested respiration, and slowed, irregular, or stopped heartbeat. THIS IS A LIFE-THREATENING CONDITION.	Take shelter from cold temperatures (e.g., in a heated vehicle or structure). When shivering stops and lethargy and other symptoms increase, a major emergency is imminent. Further heat loss should be prevented by any means possible (E.G., wrap the victim in a blanket with a warm companion); Notify the SSO, or the FTL or JS, and immediately seek medical attention for life-threatening illness per Section 9.3.1.1.

Hazard	Hazard Assessment	Signs/Symptoms of Exposure & Detection Methods	Response Actions & Protective Measures
ALTITUDE SICKNESS	Negligible to Serious	Symptoms such as headache (mild to severe), fatigue, insomnia, drowsiness, and loss of appetite may occur usually within 2 to 3 days following rapid ascent to high altitude (e.g., Los Alamos @ ~7,400)	Prevent sickness by gradual acclimatization to altitude; this may take 3 weeks or more. Individuals from lower altitudes should spend a few days at 5,000 to 7,000 ft. before ascending to higher altitudes, and further ascent should not exceed 1,000' per day. Do not ascend to higher altitude until all symptoms have subsided. Notify the SSO, or the FTL or JS, immediately of occurrence of symptoms of occupational exposure to altitude sickness; if appropriate, seek medical attention per Section 9.3.1.2. Treatment may include: rest, increased fluid intake to avoid dehydration and use of pain reliever.
SUNBURN	Moderate to Imminent	Pink or red, warm or hot skin; in severe cases blistering may also occur; eyes may become swollen and/or blood-shot; corneal or retinal burns could result in blindness ("snow blindness")	Excessive solar ultraviolet radiation can be encountered, especially at higher altitudes. Use sunscreen with protection factor (SPF) of ≥15 on exposed skin. Reapply sunscreen every 4 hours and after experiencing heavy perspiration or wiping skin with a towel. Treatment may include: application of gel or cream containing aloe vera to burned skin; taking 2 aspirin initially and every 6 hours as needed; drinking fluids and rest. If eyes are swollen blood-shot or burned, or if blistering of skin occurs, notify the SSO, or the FTL or JS, and immediately seek medical attention per Section 9.3.1.2.
ANIMAL ATTACKS	Minor to Serious	Avoid contact with wild or stray animals. If bitten or scratched and skin surface is broken, notify the SSO, or the FTL or JS, immediately and seek/provide appropriate medical attention per Section 9.3.	

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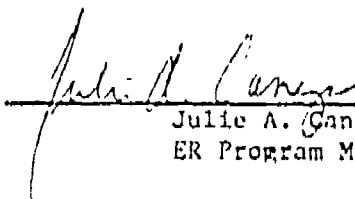
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ER Individual Record Transmittal Form

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Los Alamos
Environmental Restoration Project