EM-Solid Waste Operations

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LOS ALAMOS NATIONAL LABORAT

LEGACY MATERIAL WORK-OFF PRC

ON-SITE HEALTH AND SAFETY PL

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LOS ALAMOS NATIONAL LABORATORY

LEGACY MATERIAL WORK-OFF PROJECT

ON-SITE HEALTH AND SAFETY PLAN

1.0 GENERAL:

This health and safety plan (HASP) has been designed to establish safe procedures and practices for Los Alamos National Laboratory (LANL) Legacy Materials Team (LMT)

personnel and any subcontractor personnel, engaged in the on-site work associated with the handling, segregation, and packaging of legacy materials, as defined by LANL in the Legacy Material Action Plan.

All on-site personnel are required to read this HASP, sign a Compliance Agreement (Appendix I) and abide by all its provisions. The development of this plan is in conformance with the directives and requirements of the Occupational Safety and Health Administration (OSHA) requirements as set forth in 29 CFR 1910.120, EPA's Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, and in conjunction with LANL health and safety requirements. This HASP may not be modified without the approval of the appropriate LANL personnel in response to additional information about the site and/or materials expected to be present.

2.0 STAFF ORGANIZATION - RESPONSIBILITIES AND AUTHORITIES:

The authorities and responsibilities of the key health and safety personnel are discussed below.

2.1 LANL Industrial Hygiene and Safety Group (ESH-5)

The ESH-5 personnel assigned to the project are responsible for technical health and safety aspects of the project, including review and approval of this HASP. Inquiries regarding project procedures, and other technical or regulatory issues should be addressed to these individuals.

Any changes to the HASP must be approved by ESH-5. ESH-5 will advise the EM-SWO Hazardous and Chemical Project Lead on health and safety issues. ESH-5 is the primary contact on occupational health and safety.

2.2 EM-SWO Legacy Material Work-off Project Leader

The EM-SWO Legacy Material Work-off Project Leader is ultimately responsible for ensuring that all project activities are completed in accordance with the requirements and procedures in this plan. The EM-SWO Legacy Material Work-off Project Leader is responsible to provide the LM Field Team Lead with the equipment, materials and qualified personnel to implement fully all safety requirements in this HASP.

It is the EM-SWO Legacy Material Work-off Project Leader's responsibility to thoroughly investigate all accidents and incidents on the project. The EM-SWO Legacy Material Work-off Project Leader must perform at least one on-site safety review during the project.

The EM-SWO Legacy Material Work-off Project Leader must approve in writing any addenda or modifications of the HASP, and will formally review this plan with the ESH-5 personnel assigned to the project when operational changes occur, or as otherwise needed, until the project is completed.

2.3 LM Field Team Lead

The Legacy Materials (LM) Field Team Lead has the primary responsibility for all on-site activities of LMT personnel at LANL. He/she is responsible for implementation of the HASP, including communication of site requirements to all on-site project personnel (including subcontractors) and consultation with the ESH-5 personnel assigned to the project. Although health and safety is the responsibility of all personnel working on the Site, the LM Field Team Lead will receive special assistance in these areas from the ESH-1 and ESH-5 personnel assigned to the project. The LM Field Team Lead will be responsible for informing the EM-SWO Hazardous and Chemical Project Lead of any changes in the field operations or procedures so that those changes may be addressed in the HASP. Other responsibilities include:

- Stopping work, as required, to ensure personal safety and protection of property, or in cases of life or property-threatening safety noncompliance
- Determining and posting routes to medical facilities and emergency telephone numbers, and arranging emergency transportation to medical facilities
- Observing on-site project personnel for signs of chemical or physical trauma

2.4 LMT Personnel

- Refuse to participate in any on-site operation that he/she feels may endanger the health and safety of himself/herself and others.
- Observe directives, suggestion, and recommendations by ESH personnel.
- Actively participate in all required training.
- Seek answers to any question or concerns one may have regarding health and safety at the site.
- Observe any medical restrictions placed on work activities, including respirator usage.
- Adhere to proper procedures for all work activities and all use of personal protective equipment.
- Don PPE, per existing ESH-1 practices, prior to entering a radioactivity control area (RCA) and following the specified ESH-1 procedures for personnel monitoring when exiting the RCA.
- All handling of potentially radioactive material must be performed in an RCA, with proper PPE and RCT support, unless the items are packaged in sealed, DOT specification shipping containers.
- Guard against damage to the assigned personal protective equipment.
- Inform LM Field Team Lead of any damaged, defective or non-functioning personal protective equipment.
- Inform LM Field Team Lead if there is personnel exposure or injury.

LMT personnel at all levels have the authority to stop work and temporarily suspend any activity that, in their judgment, poses a threat to health, safety, property, or the environment. In the event that the on-site personnel suspend the work activities, they must alert the LM Field Team Lead or the EM-SWO Hazardous and Chemical Project Lead as soon as practical. Work activities will resume only when/if the identified hazards have been controlled, with the approval of the Project Lead and the LM Field Team Lead.

2.5 Contractors and Sub-Contractors

Contractors and sub-contractors must prepare and adhere to a LANL-approved HASP specific to the activities inherent to the LM Work-Off Project. This HASP will comply with all LANL safety and health procedures as well as the provisions of the LM/EM-SWO health and safety plan. Contractors and sub-contractors must supply their own personal protective equipment, including respirators, and must be willing and able to share with LANL proof of compliance with pertinent regulation, (e.g., medical, fitness for duty statements, safety performance history, training records).

3.0 SITE BACKGROUND:

3.1 General

The Los Alamos National Laboratory, Los Alamos, New Mexico site is located in the mountain area surrounding the city of Los Alamos New Mexico. The mailing address is P.O. Box 1663 Los Alamos, NM 87545.

Emergency or contingency planning is considered to be necessary for the health and safety of the personnel working at the location. These plans are readily available for review through the EM-SWO group office.

The scope of work includes identification, segregation, and packaging of legacy materials at/from sites throughout LANL.

3.2 Estimate of Types of Materials:

Initial project scope includes various types of RCRA and non-regulated chemical materials including but not limited to flammables, corrosives, reactives, oxidizers, poisons, mixed low-level radioactive materials, and mixtures of these.

Due to the potentially hazardous materials that may be encountered during material identification, segregation, and packaging, all such activities shall be conducted in the appropriate Personal Protective Equipment (PPE). In addition, other types of materials i.e. repack, organic debris, cylinders, etc. may also be expected to be present on the site, and proper PPE shall be utilized.

This site safety plan is intended to serve as a reference for use by on-site LMT personnel. For more information, consult with the LM Field Team Lead, the LM Review Team, or the assigned ESH-5 personnel for additional chemical and toxicological information available on hazardous materials.

Personnel working on this project for periods of greater than ten (10) days cumulative shall receive the required LANL training prior to commencing work on this project. All LMT personnel shall be familiar with all health and safety documents related to the project. Additional training required by LANL or EM-SWO shall be scheduled by the EM-SWO Training Coordinator at the earliest possible date.

4.0 Hazard Assessment and Control

4.1 General:

A number of hazards exist or could exist during the collection, segregation, and packaging of legacy materials at LANL. These hazards are primarily due to the toxic nature of chemicals contained in the collected materials. In addition to the chemical hazards, some materials could expose personnel to radioactivity and radioactive surface contamination. The physical nature of the work could also expose personnel to increased risk. This section assesses on-site operations by classifying the work into two activity groups: Non-Contact Activities and Limited Contact Activities. These groups are based on the likelihood of chemical and radiological exposure.

Actions will be taken to reduce and maintain employee exposure to below the permissible exposure levels/threshold limit values of those hazardous chemicals found on the site. These actions include implementing engineering controls, utilizing PPE, designating and limiting access to certain work areas, and implementing appropriate personnel and equipment decontamination procedures.

Before work at any LANL location begins, a LANL Site Specific Safety Plan (Appendix II) must be filled out and signed by all LMT personnel working at the location. This form ensures that all personnel are aware of possible hazards and the location of safety equipment.

Appendix III contains a table of potential radioactive contaminants and evaluation information on those contaminants. Physical hazards and their control are addressed in tables in Appendix IV.

4.2 Engineering Controls:

Dust control operations (wetting down dusty materials if appropriate) will be utilized as necessary to prevent the spread of airborne contamination. Fume hoods to reduce or eliminate exposure potential from organic vapors may be used where necessary. These hoods may be either stationary or mobile, but all will be assessed by ESH personnel for adequate capture velocity. Containment devices will be used to prevent the spread of hazardous materials should spills occur, and to prevent unprotected contact with hazardous materials by other personnel. Decontamination measures will be implemented to prevent cross

contamination and spread of hazardous substances and radioactive contamination.

4.3 Personal Protective Equipment:

It is important that PPE (Level D minimum) and safety requirements are appropriate to protect against potential or known hazards at LANL. Protective equipment has been selected based on the types, concentrations, possibilities and the routes of personnel exposure from substances on site. The levels of protection provided in this section are the minimum required for the each activity group. PPE will be utilized only after engineering control options have been assessed for applicability. ESH personnel may require an upgrade in PPE level at any time, if the risk of exposure increases to an unacceptable level.

4.4 Approvals:

The LM Field Team Lead bears ultimate responsibility for specifying personal protective equipment. Equipment purchases, repairs, and use are all approved by the LANL EM-SWO Hazardous and Chemical Project Lead.

All jobs involving direct material contact require a LANL task-specific safety and health plan Appendix V), which specifies the personal protective equipment that will be used on the job. To ensure that the correct protective equipment is selected, the plan must be approved by the LM Field Team Lead before the job begins. Any changes in equipment selection, prior to or during the job, must be approved. This is especially pertinent to "downgrades." If the task is frequently repeated, a copy of the approved task-specific plan may be read, signed and used by personnel without repeat approval.

4.5 Activity Groups:

LMT personnel activities at LANL are listed here and divided into two groups according to the possibility of contact with hazardous materials. The minimum personal protective equipment required follows each group. Office activities such as document preparation, document review, safety and staff meetings, and training have not been included and do not require personal protective equipment.

4.5.1 Non-Contact Activities

Activities that involve no contact with contaminated material include, but are not limited to:

- Storage inventory and inspections
- Load check-in
- Shipment preparation and palletizing
- Equipment maintenance
- Housekeeping
- Stocking supplies
- Transportation activities (i.e., loading/unloading vehicles)

Minimum Personal Protective Equipment (Level D):

- Standard work clothes (long-sleeved shirt, long pants, or coveralls)
- Gloves, leather
- Boots/shoes, leather, steel toe and shank
- Safety glasses
- Personal radiological monitoring device (e.g., TLD)
- Hardhat (only in posted areas)
- An additional set of Level D PPE shall be donned when handling radioactive materials. This additional PPE will consist of a jacket or lab coat (blue) and bib overalls. This additional PPE will be removed after following the specified ESH-1 procedures for personnel monitoring when exiting the RCA.

(See Section 5. for specific operating procedures for Palletizing/Shipping and Radiation Screening.)

4.5.2 Limited Contact Activities

Activities that involve indirect or potential for contact with material include:

- Collection, segregation, and packaging of materials
- Cylinder packaging

Minimum Personal Protective Equipment (Level D):

- Standard work clothes
- Gloves, leather (for drum handling)
- Gloves, chemical resistant, Pylox or N-Dex, (for materials handling)
- Boots/shoes, leather, steel toe and shank
- Safety glasses
- Personal radiological monitoring device
- Hardhat (only if posted or required)
- An additional set of Level D PPE shall be donned when handling radioactive materials. This additional PPE will consist of a jacket or lab coat (blue) and bib overalls. This additional PPE will be removed after following the specified ESH-1 procedures for personnel monitoring when exiting the RCA.

(See Section 5. for specific operating procedures for Segregation and Lab Packing.)

5.0 STANDARD OPERATING PROCEDURES:

5.1 Non-Contact Activities

5.1.1 Palletizing/Shipping:

5.1.1.1 Purpose

This subsection specifies the standard operating procedure for palletizing and shipping drums at LANL

5.1.1.2 Summary

After packaging, the material must be shipped to a storage or disposal facility. Specific states have different requirements; this procedure is a compilation of all. For proper shipping and ease of handling at all facilities the following guidelines have been developed.

5.1.1.3 Safety:

Standard work clothes, safety glasses, steel toe shoes/boots, and hard hat (if posted or required) must be used when palletizing.

5.1.1.4 Equipment:

The following items may be used for this procedure, if appropriate:

1. Stretch wrap or banding machine

5.1.1.5 Site Preparation:

1. Locate area free from personal traffic as well as mechanical traffic (i.e. forklift trucks).

2. Move appropriated supply of pallets to work area.

3. Drums shipped to different facilities must be palletized separately.

4. Inspect all drums for structural integrity. Pay particular attention to metal drums. The primary areas for rust and structural flaws are:

a. upper and lower chimes

b. drum ribs

c. welded seam on the side

These areas along with the bungs must be inspected thoroughly prior to shipment. If any flaws or excessive rust are present the drum must be over packed.

5.1.1.6 Procedure:

1. Palletize drums with labels and markings facing to the side, so that all labels and markings are visible when pallets are stacked end to end.

2. Drums must also be palletized according to 49 CFR 177.848 and any applicable DOT Exemption.

3. Using stretch wrap, wrap the pallets a minimum of 5 times or use banding equipment once around, when appropriate.

4. DO NOT triple stack drums larger than 10 gallons on a pallet Also, DO NOT triple stack pallets.

5. Check palletized drums for radioactivity.

6. Load palletized drums on to the truck distributing the weight evenly. NOTE: There must be at least 2 feet clearance between the top of the drums and the roof on the truck

7. Check the drum count and check the packing and loading area for missed drums.

5.1.1.7 Site Demobilization:

1. Have the loaded truck screened for radioactivity.

2. Send truck on its way.

3. Clean and sweep-up work area.

5.1.2 Radiation Screening:

5.1.2.1 Purpose:

This subsection specifies the standard operating procedure for screening the work area, the materials in that area, and the packaged materials prior to shipment for radiation levels above background.

5.1.2.2 Summary:

Screening for radiation levels must be done to not only protect LMT personnel but to ensure that no radioactive materials are sent to any facilities that are not permitted to accept those materials.

5.1.2.3 Safety:

Standard work clothes and acceptable "Level D" PPE is to be worn when performing this procedure.

5.1.2.4 Equipment:

The following equipment must be available for this operation:

1. Overhoff Model 394c for tritium detection
2. Ludlum 139 with air proportional probe for alpha detection
3. Eberline ESP SMART 1with a pancake HP 260 probe for beta and gamma detection
4. Eberline R02 for dose and exposure detection

5.1.2.5 Site Preparation:

1. Review the operating instructions for the Survey Meter.

2. Take a background measurement per Survey Meter Operating Instructions.

5.1.2.6 Procedure:

1. Don all personal protective equipment as needed.

2. Scan your general work area by walking around the perimeter and slowly moving the survey meter up and down pointing it at the floor, walls and ceiling. If the work area measures above background levels, immediately leave the area and contact the ESH-5 personnel assigned to the project.

3. Scan the materials. Walk around the work area pointing the meter at the materials to be packaged. If any individual materials are found to have radiation levels above background separate those from the other material.

4. When packaging is complete, scan the containers prior to loading them onto the truck. This will determine if there has been any surface contamination. Walk around the packaged containers pointing the Survey Meter at the containers. If a container or containers show radiation levels higher than background, notify the ESH-5 personnel assigned to the project to determine the source of contamination.

5.2 Limited Contact Activities:

5.2.1 Segregation and Lab Packing:

5.2.1.1 Purpose:

This subsection specifies the standard operating procedure for the segregation and lab packing of materials.

5.2.1.2 Equipment:

The following equipment must be available before starting work:

1. Fire extinguisher - ABC Type or Dry Chemical

2. Barrier tape

3. Warning signs

4. Spill control materials

5. Reference materials

5.2.1.3 Safety:

All standard safety equipment must be used during the segregation and lab pack process. It includes:

1. Standard work clothes

2. Safety glasses

3. Steel toe boots/shoes

4. Hard hat (only if required)

5. Dust mask (during packaging operations, if required)

5.2.1.4 Site Preparation:

1. Locate an area near the stored chemicals and away from spark or flame. Locate emergency escape routes and availability of emergency equipment.

2. Check work area for radioactivity.

3. Mark off area with barrier tape and position warning signs in plain view. All segregating and packaging must be done within this exclusion zone.

4. When appropriate all lab-packed drums will be assigned a generic shipping name per 49 CFR, 173.12 (a) in place of the specific chemical name(s). The following require additions to the basic shipping description when using a generic name:

A. Use of a Reportable Quantity (RQ) in the shipping description per §171.8

B. All poisonous materials

C. Limited quantities

D. Empty packaging

E. The wording "Poison Inhalation Hazard" shall be used in association with the description if the criteria in § 173.3(a)(2) are met.

F. All others as required by § 172.203

5. All materials must be segregated by DOT hazard class and all materials contained within each lab pack must be compatible. Liquids and solids can not be packaged together. Inorganic and organic material must be segregated. Acids and bases may not be packaged together. Items which are classified as DOT non-hazardous shall be segregated by physical form and packed separately.

5.2.1.5 Procedure:

1. Don all safety equipment.

2. Assign waste codes according to the EPA regulations in 40 CFR 261. Each material that possesses a "D" listed characteristic MUST be assigned the appropriate code. This may be in addition to a primary code assignment. Example: Lead Acetate is U144 and D008.

3. Initially segregate all lab pack materials into RCRA and non-RCRA categories according to the LANL Chemical Waste Disposal Request (CWDR) and LANL Waste Data Sheets.

4. The following illustrates the proper packaging method:

A. Place a bed of vermiculite on bottom of each drum, three inches for 30, 20 or 10-gallon drums and two inches for 5-gallon drums.

B. Pack a single layer of the containerized material, recording and identifying each container on the drum inventory sheet, on the absorbent bed --allowing adequate clearance between each container and top/sides of the drum.

C. Cover each individual inner container layer with approximately two inches of vermiculite.

D. Allowing a minimum of two inches, cover the top layer with vermiculite to prevent breakage during transportation.

E. Tightly secure the lid on the drum. Mark the drum with the appropriate drum number and record drum number on the Waste Data Form. (Note: When using EM-SWO generated waste labels, the container number is preprinted.)

F. Apply the correct labels (yellow "Hazardous Waste" label or the blue "Non-Regulated Waste" label, as appropriate) to the container.

6.0 ACCIDENT PREVENTION

6.1 Responsible Personnel:

All personnel shall conduct themselves in a manner that will minimize the potential for accidents. The LM Field Team Lead shall see that LMT personnel are operating in a safe manner in compliance with this document. Any variations from these documents must be approved by the

LM Field Team Lead prior to initiation.

6.2 General Site Safety Rules:

There will be an informal tailgate safety meeting each morning prior to commencing operations, conducted by the LM Field Team Lead. Daily operations, Lessons Learned, specific procedures, special hazards, PPE, etc. will be discussed. LMT personnel shall sign a roster indicating they have attended the meeting and understand the topics discussed.

All personnel on site will be required to wear at a minimum the personal protective equipment specified in this On Site Health and Safety Plan. Contact lenses shall not be worn for any activities involving hazardous material contact.

LMT personnel will comply with all safety requirements, site specific safety concerns, and site-specific training required for work at any site throughout the work off plan and schedule. LMT personnel will report any safety concerns directly to the site contact, usually the Waste Management Coordinator (WMC), Facility Management Unit (FMU) personnel, Facility Manager (FM), or the designee of the WMC, FMU, or FM.

All questions pertaining to LMT activity at the LANL site should be referred to the LM Field Team Lead or the EM-SWO Hazardous and Chemical Project Lead, if the Field Lead is not available.

Following all hazardous material contact activities, or any work in the material storage area, all personnel must thoroughly wash their hands and faces prior to eating, drinking, or smoking.

Prior to departing from the LANL site, or at the end of the workday, all personnel will decontaminate according to procedures given in Section 11.

6.3 Environmental Stress:

Adverse climatic conditions, heat and cold are important considerations in planning and conducting work at the Site. The effects of ambient temperature can cause physical discomfort, loss of efficiency, personal injury and increased accident probability. In particular, heat stress, due to protective clothing decreasing body ventilation, is an important factor.

The following plans serve to outline procedures to mitigate environmental stress factors.

6.3.1 Heat Stress Prevention Plan:

Due to the increase in ambient air temperatures and the effects of decreased body ventilation due to protective outer wear, there exists an increase in the potential for heat casualties. Site personnel will be instructed in the identification, first aid, and the prevention of heat stress.

6.3.1.1 Identification and Treatment:

1. Heat Exhaustion

(i) Symptoms: Usually begins with muscular weakness, dizziness, nausea, and a staggering gait. Vomiting is frequent. The bowels may move involuntarily. The victim is very pale, his skin is clammy, and he may perspire profusely. The pulse is weak and fast, his breathing is shallow. He may faint unless he lies down. This may pass, but sometimes it remains and death could occur.

(ii) First Aid: Immediately remove the victim to a shady or cool area with good air circulation. Remove all protective outerwear. Treat the victim for shock. (Make him lie down, raise his feet 6-12 inches and keep him warm but loosen all clothing.) Call 911 or 667-6211 from a cellular telephone.

2. Heat Stroke

(i) Symptoms: This is the most serious of heat casualties due to the fact that the body excessively overheats. Body temperatures often are between 1070F- I 100F. There is often severe headache, dizziness, nausea, depression, and the skin is dry, red and hot. Unconsciousness follows quickly and death is imminent if exposure continues. The attack will usually occur suddenly.

(ii) First Aid: Immediately evacuate the victim to a cool and shady area. Remove all protective outerwear and all personal clothing. Lay him on his back with head and shoulders slightly elevated. It is imperative that the body temperature be lowered immediately. This can be accomplished by applying cold, wet towels; ice bags, etc. The main objective is to cool him without chilling. Give no stimulants. Call 911 or 667-6211 from a cellular telephone.

6.3.1.2 Prevention of Heat Stress:

1. One of the major causes of heat casualties is the depletion of body fluids. Personnel should replace water and electrolyte lost by sweating. These can be replaced by drinking a commercial drink mix such as Gatorade.

2. A work schedule should be established so that the majority of work will be during the morning hours of the day before ambient air temperature levels reach their highs. ESH-5 personnel shall approve this work/rest schedule.

3. Work/rest guidelines will be implemented for personnel required to wear Level B protection.

4. A sufficient period will be allowed for personnel to "cool down". This may require shifts of workers during operations.

5. Cooling devices may be worn under suits; however, these increase the amount of weight which must be carried.

6. Portable showers and hosing down may be utilized.

7. Good hygienic standards must be maintained by frequent changes of clothing and daily showering. Clothing should be permitted to dry during rest periods. Persons who notice skin problems should immediately consult medical personnel.

6.3.2 Cold Stress Plan:

A decrease in ambient air temperature and effects of wind velocity increase the potential for injury due to cold stress. Site personnel will be instructed in the identification, prevention and first aid for cold stress.

6.3.2.1 Identification and Treatment of Cold Stress:

1. Symptoms of Frostbite: Frostbite usually begins with numbness and/or pain in the extremities or exposed skin surfaces and a decrease in manual dexterity.

2. Symptoms of Cold Stress (hypothermia): In hypothermia, the body core temperature is reduced. Hypothermia will very likely result in reduced mental alertness, reduction in rational decision making, fatigue, drowsiness and loss of consciousness with a threat of fatal consequences. During exposure to cold, severe shivering develops as a symptom of cold stress.

3. First Aid: The onset of heavy shivering, frostbite, excessive fatigue or other symptoms of cold stress are indications for immediate return to the heated shelter. The outer layer of clothing should be removed and the remainder of the clothing loosened to permit sweat evaporation. Warm sweet drinks and soups should be consumed to provide caloric intake and fluid volume. Oral temperature will be determined and the workman will be transported to a medical facility if the core body temperature is below 96 degrees F.

6.3.2.2 Cold Stress Prevention Plan

1. **Wear appropriate clothing**. Encourage all personnel to dress according to the weather. Clothing should be light, loose, and layered. An outer layer that prevents the wind from penetrating is recommended. Multiple loose layers trap air and provide additional insulation, and allow adding or shedding layers of clothing as the weather changes. The garments should not be so loose as to cause a potential hazard by getting caught in moving materials, or that hinder work activity. Provide helmet liners or encourage personnel to wear a warm hat. Provide gloves and liners: as a minimum thick cotton liners should be used. If available, woolen liners or polypropylene ski-glove liners should be used in extreme cold. For the feet, thick woolen socks and water repellent shoes/boots.

2. **Provide warm shelter.** This may range from an on-site trailer to a car or truck running with the heater on. Remember to crack a window if using a vehicle as a shelter.

3. **Stay dry.** Minimize perspiration by dressing lightly and working slowly. If the work is heavy, keep a change of dry clothes available.

4. **Eat properly.** Body fuel, whether food or body fat, is converted into heat to prevent the body core temperature from dropping. Encourage employees to eat breakfast and lunch. Dieters and extremely thin persons develop hypothermia more rapidly than others do.

5. **Prevent dehydration.** Fluid loss can substantially reduce blood volume. The brain and heart cannot perform properly without adequately oxygenated blood. Fluid loss may occur from perspiration and/or breathing dry air. Fluids should be kept on site, both water and/or Gatorade and hot beverages. Coffee intake should be limited as it is a diuretic (increases urinary output) and affects the circulatory process.

6. **Medication and alcohol effects.** Some medications, such as blood pressure control drugs,

anti-depressants and certain heart medications, affect the body's response to outside temperatures. Personnel must notify their supervisors if taking any medication. Alcohol is not allowed on site. Alcohol gives the illusion of warmth, but actually takes blood from the core of the body and brings a rush to the skin. Cigarette smoking also reduces the circulatory process, and may increase the onset of cold stress symptoms.

7. **Monitor workers.** Use the " Buddy System" to watch one another for signs of cold stress and frostbite. These signs include rosy-red coloring of skin, shivering, lack of coordination, drowsiness, and pain in extremities. The latter can be the first warning of dangerous exposure to cold. Severe shivering should be treated immediately.

8. **Work/rest schedule.** The ACGIH TLV booklet does not have work/warm-up schedules recommended until temperatures reach -15°F with no wind; however, workers should warm up, especially head, hands and feet. Warm, sweet, non-caffeinated drinks or soup should be taken during these rest periods.

9. **Control measures.** Continuous exposure of skin should not be permitted below -26°F or equivalent wind chill. If clothing gets wet in temperatures below 36°F, the worker must immediately change into dry clothing. Engineering controls should be used where feasible (e.g., wind barriers). Administrative controls should augment other controls (e.g., extra workers, avoid periods of standing still).

6.4 Buddy System

6.4.1 Purpose:

The "Buddy System" is defined as "a system of organizing employees into work groups in such a manner that each employee of the work group is designated to observe the activities of at least one other employee in the work group."

The purpose of the "buddy system" is to:

1. Provide his or her partner with assistance.

2. Observe his or her partner for signs of chemical or environmental exposure.

3. Periodically check the integrity of his or her partner's protective clothing.

4. Notify others if emergency help is needed.

6.4.2 Procedure:

1. A minimum of two persons is required for any job involving hazardous materials or substances.

2. When working, persons are to maintain contact, either visual or audio, with each other. This is required at all times when working in limited access rooms or in potentially hazardous environments.

7.0 FIRE PREVENTION AND PROTECTION:

To minimize the potential for fires and to reduce the impact of any fire, proper fire prevention and protection procedures will be followed. Requirements include, but are not limited to, the following:

7.1 Fire Prevention:

- No smoking is allowed in the storage area or any EXCLUSION ZONE.
- No flammable liquid with a flash point (closed-cup test) below 100°F (37.7°C), shall be used for cleaning purposes.
- Equipment using flammable liquid fuel shall be shut down during refueling, servicing, or maintenance.
- Spark producing activities and other ignition sources will be kept at a minimum distance from stored flammable liquids. The safe distance will be determined in accordance with LANL guidelines.

7.2 Fire Protection:

- Portable fire extinguishers shall be provided where needed and inspected and maintained in accordance with National Fide Protection Association (NFPA) 10, Portable Fire Extinguishers.
- Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
- Fire extinguisher equipment shall be provided in storage areas according to the hazard present.

8.0. HEALTH AND SAFETY TRAINING PROGRAM:

8.1 Initial Training:

LANL LMT on-site personnel and sub-contractor personnel who have the potential for exposure to hazardous materials or waste are required to have a minimum of 40 hours training and annual refreshers to meet requirements of 29 CFR 1910.120.

8.2 Site Specific Training:

Employees assigned to the LANL Site will be given specific training to include the following subject matter as required by 29 CFR 1910.120:

- Acute and chronic effects of toxic chemicals found at the LANL Site.
- Routes of potential exposure and on-site activities that could result in such exposure.
- Need for personal protection, types of protection, its effectiveness and limitations.
- Proper use and fitting of respiratory protective equipment
- Identification, segregation and packaging techniques for household hazards and related work activities general rules and safeguards, including current standards and applicable regulations.
- Wearing contact lenses,
- Eating, drinking, smoking chewing gum and use of smokeless tobacco products,
- Wearing of personal articles such as watches, rings, etc.,
- Working when ill.
- Engineering controls and safe work practices associated with each employee's work assignment including dust control measures and use of "buddy system".
- Personal and equipment decontamination procedures.
- Emergency response procedures for LANL on-site and off site incidents.
- Basic operational safety, emphasizing hazards expected on-site.

8.3 Visitor and Sub-Contractor Training:

Subcontractors and visitors to the LANL LM sites will be made aware of the hazards associated with the site, and site-specific emergency procedures. They also must possess the same or equivalent training required of LMT personnel to enter hazardous areas. EM-SWO training management personnel will determine equivalency.

9.0 PERSONNEL AND EQUIPMENT DECONTAMINATION:

9.1 General:

Each time an employee completes a hazardous material contact activity, he/she must make a thorough self-inspection. Equipment must be removed without exposure to the wearer. Before eating, drinking, applying make-up, or use of tobacco products, hands and face must be washed sufficiently to avoid accidental ingestion of hazardous materials. Footwear should be inspected prior to egress from a contaminated area to avoid the spread of contaminants outside the work area. If the footwear becomes contaminated, ESH-1 procedures will be followed for decontamination.

Only after satisfactory showering at the end of the daily activity may the employee relax his or her vigilance to accidental chemical exposure. It is, therefore, mandatory that the employee wash all exposed body parts as soon as practical and prior to departing the LM site after

hazardous material contact activities.

9.2 Clothing:

LANL shall provide all required safety clothing and PPE. No PPE or clothing (including boots) shall be worn or carried off-site unless properly decontaminated.

9.3 Packaging of Items:

All disposable clothing and other contaminated material will be placed in approved, labeled containers for storage on-site. Containers and/or their contents will be disposed of with other contaminated materials.

10.0 EMERGENCY PROCEDURES:

For a list of emergency contacts for the LANL Legacy Materials Work-Off Project, see Appendix VI.

10.1 Spills:

Response to spills by LMT personnel shall never be initiated in situations calling for Level A or B personal protective equipment. In addition, LMT personnel shall not clean up spills of any quantity of unknown materials, or of known hazardous materials greater than 1 gallon. For clean up of these spills, the LANL Emergency Management and Response Office (EM&R) shall be contacted from a cellular telephone at 667-6211 or from a LANL phone at 911. The site contacts, as noted on the LMT site-specific safety plan for the affected site, will also be notified.

If the spill can be cleaned up safely by LMT personnel, they shall:

- Put on appropriate personal protection equipment (Level C) such as chemical resistant Tyvek coveralls and chemical resistant gloves.
- Contain liquid spill with absorbent.
- Keep spill from getting into storm drain or sewer system.
- Clean up spill immediately before someone may walk or drive over it, or restrict access to the area.
- Always maintain a clear path of escape. Do not walk over or onto spilled material.
- For spills of solid materials, carefully sweep up with broom and shovel into drum liner from upwind direction. Be careful not to create dust problem or create sparks for potentially ignitable materials.
- For spills of liquid materials, absorb spill with absorbent from upwind direction. Be careful not to splash liquid when applying absorbent. Do not toss absorbent into spill, rather apply with broom and shovel to avoid splashing. Apply absorbent first around the outside edge of the spill, and then fill in towards center with broom or shovel.
- Place spill clean up waste into an appropriate container for treatment and/or disposal.
- Label and mark the drum appropriately for storage, treatment, and/or disposal.

10.2 Fires:

- Only if fully trained in the use of fire extinguishers, contain fire with the appropriate fire extinguisher.
- Never fight a chemical fire. By products of combustion may be extremely hazardous.
- Never fight a fire in a confined space.
- Never fight a fire where there is a risk of oxygen deficiency.
- Never fight a fire where there is a risk of explosion.
- If fire is too large or hazardous to contain, pull fire alarm if available, evacuate area, and call EM&R at 667-6211 from a cellular telephone, or call 911 from a LANL telephone.
- Always approach fire from upwind.
- Approach and fight fire crouched low in case there's a flare up.
- Shoot retardant at base of fire. Follow directions on fire extinguisher.
- Always maintain a clear escape path.
- Never turn your back on a fire.
- Place clean up debris into appropriate drum for treatment and/or disposal, after making sure there are no cinders and the debris has adequately cooled.

10.3 Evacuation:

- All personnel must respond to LANL emergency and fire alarm systems.

- Stop what you are doing. Do not take time to retrieve personal property.
- Follow pre-defined evacuation routes at the site, if available. If pre-defined route is obstructed, follow alternate route.
- Listen for directions that may be given over the speaker system.
- Determine which muster station, if available, to use based on announcements and by observing nearby windsocks, if any. Follow the site specific evacuation plan at all times.
- Go to the nearest muster station or other location that is upwind and of sufficient distance away from the emergency.
- Once at the muster station or location, wait for further instructions. Evacuation may be necessary.
- Remain at the muster location for roll call. DO NOT LEAVE until instructed by EM&R or appropriate LANL facility personnel.
- No one may return to the evacuated area until EM&R or appropriate LANL facility personnel give permission.

10.4 Illnesses and Injuries:

10.4.1 Bleeding:

- Stop bleeding by applying pressure to wound with clean hand or towel.
- Do not apply a tourniquet.
- If bleeding will not stop, call EM&R at 667-6211 from the cellular telephone, or call 911 from a LANL telephone.
- Seek medical attention if necessary. The LANL Occupational Medicine Clinic can be contacted at 667-0660.

10.4.2 Breathing Difficulties:

- If individual is conscious, remove from area and get fresh air.
- If individual stopped breathing, call EM&R at 667-6211 from a cellular telephone, or call 911 from a LANL telephone.
- Administer CPR, if trained to do so.

10.4.3 Burns

- For any burned area, flush the area with running water for fifteen minutes. Check the area for severity of burn. If the burn is deemed a second-degree burn, continue flushing with running water and notify EM&R at 667-6211. Continue flushing with running water until EM&R arrives and assumes responsibility for the victim.
- Do not apply ice packs to badly burned victim, it may cause tissue cell destruction and shock.
- For chemical burns, determine what the chemical was.
- For serious second degree burns and third degree burns, or if the victim goes into shock, call EM&R at 667-6211 from a cellular telephone, or call 911 from a LANL telephone.
- If victim goes into shock, keep him warm and make sure airway is not blocked.
- The LANL Occupational Medicine Clinic can be contacted at 667-0660.

10.4.4 Eye Injury

- Flush eye(s) with copious amounts of water for at least 15 minutes.
- Do not try to remove a foreign object embedded in the eye. Apply a wet patch over both eyes, inclusive of the uninjured eye.
- Call EM&R at 667-6211 from a cellular telephone, or call 911 from a LANL telephone.

10.4.5 Head Injury:

- If individual is unconscious, call EM&R at 667-6211 from a cellular telephone, or call 911 from a LANL telephone.
- If individual is conscious and not seriously injured, contact the LANL Occupational Medicine Clinic at 667-0660.

10.4.6 Ingestion:

- Determine source of poisoning, if possible.
- Call EM&R at 667-6211 from a cellular telephone, or call 911 from a LANL telephone.
- Unless instructed to do so by Poison Control Center (telephone 1-800-432-6866) or physician, do not induce vomiting.

10.4.7 Inhalation

- Remove from area and get fresh air.
- Call 911, or 667-6211 from a cellular telephone, if victim is unconscious or displaying symptoms of labored breathing.
- Administer CPR if necessary.
- Determine what individual was exposed to, if possible.
- Contact the LANL Occupational Medicine Clinic at 667-0660.

10.4.8 Skin Exposure:

- Remove contaminated Tyvek coveralls and clothing.
- Wash affected area with copious amounts of water for 15 minutes.
- Seek medical attention if necessary. The LANL Occupational Medicine Clinic can be contacted at 667-0660.

10.4.9 Strains and Sprains:

- Avoid physically demanding work.
- Seek medical attention if necessary. The LANL Occupational Medicine Clinic can be contacted at 667-0660.

10.4.10 Unconsciousness:

- Do not move individual unless he/she is in immediate danger.
- Call EM&R at 667-6211 from a cellular telephone, or call 911 from a LANL telephone.
- If currently trained, administer CPR if individual is not breathing and has no pulse.

10.4.11 Other Illnesses and Injuries:

- For minor injuries, apply general first aid.
- Do not administer any form of medication unless instructed to do so by a physician.
- If individual is unconscious, bleeding uncontrollably, not breathing, in shock, or suffering from second or third degree burns, call EM&R at 667-6211 from a cellular telephone, or call 911 from a LANL telephone.
- If currently trained, administer CPR if individual is not breathing and has no pulse.
- If individual is in shock, unconscious, or received an injury to the spinal cord (neck and back), do not move him unless he is in immediate danger. Call EM&R at 667-6211 from a cellular telephone, or call 911 from a LANL telephone.
- Keep individual warm and make sure airways are not blocked.

10.4.12 Physical Examinations:

All individuals will follow 29 CFR instructions pertaining to the establishment of 'baseline' data as the result of a physical examination. Physical examinations are required on an annual basis and a comparison of the baseline examination to the annual examination conducted after the conclusion of the Legacy Work Off Project can be evaluated by an EMSWO Health and Safety Officer.

10.5 Accident/Incident Reporting

Seek medical attention at the LANL Occupational Health Clinic for non-serious injuries. For serious or potentially serious injuries, call EM&R at 667-6211 from a cellular telephone, or call 911 from a LANL telephone, and allow the emergency personnel to select the appropriate medical facility. All accidents/incidents or "near-misses" shall be reported as soon as possible to the LM Field Team Lead, or the EM-SWO Hazardous and Chemical Project Lead if the Field Team Lead is not available.

11.0 SITE SECURITY & VISITORS:

All LMT personnel and visitors who will be entering LMT storage areas must read and sign the Site-Specific Safety Plan for that area. This form must be signed by the LM Field Team Lead or designated alternate and forwarded to the EM-SWO Hazardous and Chemical Project Lead.

The following visitor entry control protocols will be implemented for this project:

- All visitors will report to the LM Field Team Lead.
- No visitors will be allowed site entrance without prior approval of the LM Field Team Lead.
- Visitors will follow the same entry control protocols as for authorized LMT personnel. Additionally, visitors will be escorted at all times by LMT personnel.
- Visitors will not be allowed to enter any area of active hazardous work without prior approval of the LM Field Team Lead. If approved, visitors will wear the same level of protection for that area as detailed in this On-Site Health and Safety Plan. Visitors will be required to read and sign a copy of this On-Site Health and Safety Plan prior to entering any active hazardous work area.

12.0 ANNUAL REVIEW OF WRITTEN PROGRAM

On an annual basis, or sooner if there is an operational change or if otherwise needed, the EM-SWO Hazardous and Chemical Project Lead shall review the written On-Site Health and Safety Plan and update it as appropriate to meet the needs and requirements of the Legacy Materials Work-Off Project at LANL. Examples of events that trigger the need to modify and update the plan include: changes in field operations; new material acceptance criteria; and the release of new technical documents (e.g., OSHA standards, ANSI and NIOSH guidelines, etc.). The LMT shall evaluate the need for changes in procedures, personnel policies, space and facility management, etc., relative to legacy materials identified from this project and implement any changes identified.

APPENDIX I

ON-SITE HEALTH AND SAFETY PLAN

COMPLIANCE AGREEMENT

COMPLIANCE AGREEMENT

HEALTH AND SAFETY PLAN COMPLIANCE AGREEMENT

I, _____ (print name), have reviewed a copy of the On-site Health and Safety Plan for the Los Alamos National Laboratory. I have read the plan, understand it, and agree to comply with all its provisions. I understand that I could be prohibited from working at the LANL site for violating any of the safety requirements specified in the plan.

Signed:

Signature Date

APPENDIX II

LANL SITE SPECIFIC SAFETY PLAN

Site Specific Health and Safety Plan

LOS ALAMOS NATIONAL LABORATORY

Legacy Materials Work-Off Project Operations

1. Site Description:

Date: _____ **Time:** _____ **Mail Stop:** _____ **Group:** _____

Division: _____ **Technical Area:** _____

Building: _____ **Room:** _____ **Telephone:** _____

Generator: _____ **CWDR #:** _____

Work Area: [ ] Storage Area [ ] Loading Dock [ ] Shed

[ ] Indoors [ ] Outdoors [ ] Laboratory

[ ] Other _____

2. Site Assessment:

Hazards in the area:

[ ] Flammables/explosives [ ] Radiation [ ] Radioactive Materials [ ] PCB

[ ] Traffic (forklift, etc.) [ ] Noise [ ] Other _____

3. Important Telephone Numbers

Emergency (EM&R): 911 or 667-6211 Operational Safety: 667-4644

Spills 667-6211 Radiation Safety: 667-7137

Medical Assistance: 667-0660 EM-SWO: 665-6158

Industrial Hygiene: 665-4427 Environmental Protection: 667-5021

Poison Control Center: 1-800-432-6866

4. Emergency Evacuation Route and Safety Equipment Location Sketch:

Show the following: Eyewash, safety shower, fire extinguisher, telephones (cellular and fixed), evacuation route, muster area

APPENDIX III

POTENTIAL RADIOACTIVE

CONTAMINANTS EVALUATION

APPENDIX IV

PROJECT SPECIFIC HAZARD ANALYSIS:

PHYSICAL HAZARDS

General Physical Hazards	Potential Hazards	Control Measures
Equipment to be Used: • Hard Hat (when specified) • Safety glasses with side shields • Steel-toe Boots • Work Gloves Inspection Requirements • Daily	Slip, trip, fall	Site employees will be required to wear safety glass shields, work gloves, and steel-toe boots. Hard hats will be worn when specified. Whenever possible, avoid routing cords, ropes, and across walking pathways. Flag or cover inconspicuous holes to protect against

	Poor housekeeping	Work areas will be kept clean and orderly. Garbage and trash will be disposed of daily in appro containers. Tools and accessories will be properly maintained ar Work areas and floors will be kept free of dirt, grease slippery materials. Materials shall be stored to allow clear access to aisl pathways, and travel routes. Field vehicles will be kept clean and orderly (i.e., cab beds, toolboxes, trunk, camper shells).
	Manual lifting	Size up the job. Think it through! Lift with your legs, not your back. Use mechanical ec whenever possible. Get assistance when manually lifting awkwardly size those items over 60 pounds.
	Minor cuts and bruises	Workers shall wear appropriate field attire (i.e., no ta shorts, open-toe shoes, jewelry). Tools not functioning properly shall be removed from immediately and tagged for repair. Workers shall wear cotton or leather work gloves wh equipment. Have at least two persons on site trained in First Aid. All crew personnel on site shall use the buddy syster in pairs or teams).
	Chemical contact	Material Safety Data Sheets (MSDSs) shall be obtai chemicals brought on site. MSDSs shall be reviewed with project personnel bef the chemical material. Appropriate reference manuals shall be used to sup customer's MSDS library for hazard identification of already on-site (i.e.: Merck Index; Hazardous Chemi Reference, Lewis; etc.) Unknown materials will be referred to ESH-19 perso sampling and analysis prior to being moved to or acc LMT personnel.

Materials Handling	Potential Hazards	Control Measures

Equipment to be Used: • Flammable storage containers/cabinets • Drum dolly • Forklift Inspection Requirements: • Daily	Back injury Size up the job. Use mechanical equipment to lift and move items, when necessary. Lift with your legs, not your back. Do not lift awkwardly sized items and those items over 60 pounds. Get assistance when necessary. If a worker loses control of item, STAND CLEAR and DO NOT try to prevent its fall. Assure path is clear while transporting items manually (housekeeping).
	Pinch points Keep hands and feet clear of moving/suspended materials and equipment. Wear steel toe/shank safety shoes/boots.
	Drum Spillage/Puncture

	Use a drum dolly or forklift to move drums. Label all drums as to their contents. Do not move bulging or leaking drums.
	Slip, trip, or fall Assure path is clear while transporting items manually (housekeeping). Do not stand on drums, boxes, or bags of stored materials. Get assistance when necessary. Use mechanical equipment to lift and move items when necessary.
	Cuts, bruises Use cotton or leather work gloves for materials handling.
	Splashes

	Wear apron, gloves, and eye protection as needed (i.e., safety glasses/goggles, and face shield)	
	Chemical burns Wear appropriate protective clothing and chemical resistant gloves as specified.	

Compressed Gas Systems	Potential Hazards	Control Measures
Equipment to be Used: • Compressed gas cylinders • Test Kit • Forklift • Compressor Inspection Requirements: • Upon receipt • System check prior to each use	Poor quality compressed gas Breathing air shall meet the ANSI 786.1 specifications. Request certification papers with each shipment of compressed gas. Perform and document quality check on 1 out of 6 cylinders upon receipt.	
	Explosion	

	Visually inspect compressed gas cylinders before each use. Cylinders shall be stored in well-ventilated areas and securely fastened. Cylinder valves shall be closed prior to transport. Cylinders shall be protected from temperature extremes and physical damage.
	Misuse Cylinders shall be labeled as to their contents and quantity. Selected regulators shall not be transferred between different gases. Refill of cylinders must be done by trained persons.

	Disconnect Tighten down fittings and couplings before use.	
	Injury Tie down/secure egress refill whip and air lines to prevent sudden pressurization.	
	Storage Compressed gas containers should be stored in a secure, upright position with clearly visible labels.	

Drum Handling Guidelines	Potential Hazards	Control Measures

Equipment to be Used: • Drum dolly • Forklift Inspection Requirements: • Daily • Prior to movement of drums Training Requirements: • General awareness	Spills, leaks The drums and containers will be inspected and their integrity assured prior to being relocated. If a container holding hazardous materials is not in good condition or if it begins to leak, the material must be transferred from this container to a container that is in good condition. Any drums or containers under pressure, as evidenced by bulging, will not be moved. The cause for the excessive pressure will be determined immediately and appropriate containment procedures implemented to protect employees from explosive relief of the drum or container.
	Chemical exposure

- Personnel injury
- Back injury
- Prior to the movement of any drums or containers, employees involved in the drum transfer or movement shall be warned of the potential hazards associated with the contents of the drums or containers. Levels of personal protection will be based on the container contents, but at a minimum, will include steel-toe boots, and gloves, hard hats, chemical-resistant gloves and safety glasses.
- Employees shall not stand upon or work from drums or containers.
- If drums need to be moved any distance, a drum dolly or forklift should be used.
- If a worker loses control of a drum while attempting to move it, STAND CLEAR and DO NOT try to prevent its fall. If the fallen drum remains unopened or unbroken, get assistance from

	coworker(s) to upright the drum.
	Fires Fire extinguishing equipment will be on hand and ready for use to control releases of flammable or ignitable materials. The fire extinguishing equipment will be rated 20A:30BC. All drums will be marked as to the contents.
	Labeling Drum must be clearly labeled indicating contents.

Motor Vehicle Operations/Traffic	Potential Hazards	Control Measures
Equipment to be Used: • Passenger vehicles • Traffic cones • Orange vests • Barricades • Flag person(s) Inspection Requirements: • Continuous • Annual check of employee motor vehicle records • Monthly Vehicle Inspection	Vehicle accidents Personal injury	• Place physical (i.e., barricades, fencing) around work areas regularly occupied by • If working adjacent to roadways, have workers wear fluorescent orange vests. • Use warning signs or lights to alert oncoming traffic. • Assign flag person(s) if necessary to direct local traffic. • Set up temporary parking locations outside the immediate work area. • Motor vehicle operators shall obey all posted traffic signs, signals, and speed limit • Wear seat belts when vehicles are in motion. • Passenger vehicles and light trucks yield to heavy equipment.

Commercial Motor Vehicle	Potential Hazards	Control of Measures
Equipment to be Used: • Vehicles with a gross Vehicle Weight Rating (GVWR) > 10,001 pounds. Inspection Requirements: • Pre-trip • Monthly maintenance • Annual Safety Inspection	Personal Injury General Financial Property Loss	• CMVs will be operated onsite by authorized personnel only. • CMVs will be driven offsite by qualified CMV drivers in possession of a current CD to be operated. • Operators will complete a pre-trip inspection on each day of operation. • All concerns/issues regarding the CMV will be brought to the attention of the LMT immediately.

Construction/Heavy Equipment	Potential Hazards	Control Measures

Equipment to be Used: (Check all that apply) Forklift Crane Drill rig Front-end loader Backhoe Trackhoe Grader Dozer Compactor Excavator Other: Inspection Requirements: • Daily by operator • Check brakes and all required safety devices • Monthly maintenance	Personal injury Property damage Equipment damage	Only authorized personnel who are qualified and trai operate heavy equipment. Moving heavy equipment must have properly functio back-up alarms. Spotters on the ground will assist operators in manip vehicles and equipment into tight or confined spaces Operators shall maintain a constant awareness of pe and equipment in the work areas. Machinery or equipment shall not run unattended un secured by the operator. No equipment shall be left beyond a shift's end. Blade, bucket, etc. will be fully lowered or blocked wl use or being repaired. Rollover protection shall be used when conditions ca use. No overhead work shall be performed when, as a re work, the possibility of a falling object striking any pe When any machinery or equipment is found to be un deficiency is noted, the equipment shall immediately out of service and its use prohibited until unsafe con been corrected. Machinery or equipment shall not be operated in a m will endanger persons or property nor shall the safe speeds or loads be exceeded. Getting off or on any equipment while it is in motion i prohibited. Seats should be provided for each occupant of the e Safety belts shall be used by the operator while equi use. Equipment operated on the highway shall be equipp headlights, taillights, brake lights, back-up lights, anc signals visible from the front and rear. All mobile equipment and the areas in which they are shall be adequately illuminated. Mechanized equipment shall be shut down prior to a fueling operations. Whenever equipment is parked, the parking brake sl The rated capacity on lift trucks and cranes shall be the vehicle so as to be clearly visible. The load capacity ratings shall not be exceeded at a No guard, safety appliance, or device shall be tampe Heavy equipment operators shall inform their Superv any prescribed medication that they are taking that w their judgment.

		When conditions are such that lightning is occurring, equipment operations shall cease. Operations shall r again for 30 minutes after last occurrence. Personnel are not allowed to work off of machinery c them as ladders. Never walk or work directly in back of or to the side c equipment.

Noise	Potential Hazards	Control Measures
Equipment to be Used: • Ear plugs • Ear muffs • Ear canal caps Inspection Requirements: • Start-up	Temporary threshold shift. Permanent threshold shift.	Review elements of Hearing Conservation Program. Employees shall be informed of high noise areas wh protection is required and these areas marked. Provide annual audiograms for employees. Conduct noise surveys on activities in question. Provide hearing protection on site. Require use of hearing protection on the basis of site guidelines and safety measures indicated on the site safety plan. Exposure to impulse or impact noise should not exce 140-dBA peak sound level. Use engineering controls (i.e., guards, mufflers, and reduce worker exposure.

Heat Stress	Potential Hazards	Control Measures

Equipment to be Used: • Cooling vests • Core control suits • Oral thermometers • Watch Inspection Requirements: • At each break	Heat rash Keep the skin clean and dry. Change perspiration-soaked clothing, as necessary. Bathe at end of work shift or day. Apply powder to affected areas. Wear clean/dry undergarments.
	Heat cramps Drink plenty of cool fluids even when not thirsty. Provide cool fluids for work crews. Move victim to shaded, cool area. Inform Supervisor of cramps even if occurring off the job.
	Heat exhaustion

	Physiological worker monitoring as needed (i.e., heart rate, oral temperature). Set up work/rest periods. Use the buddy system. Allow workers time to acclimate. Have ice packs available for use on breaks.
	Heat stroke Evaluate possibility of night work. Perform physiological monitoring on workers during breaks. Wear body cooling devices.

Cold Stress	Potential Hazards	Control Measures
Equipment to be Used: • Insulated clothing Inspection Requirements: • On each break	Hypothermia Frost nip Frostbite Wear insulating clothing when temperatures drop below 40 F. Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. Remove wet clothing promptly. Take breaks in warm areas. Reduce work periods as necessary. Layer work clothing.	

Confined Space Entry	Potential Hazards	Control Measures

Equipment to be Used: • Portable lighting (Intrinsically Safe) • Air monitoring instruments • Extrication device (tripod/winch, etc.) • Body harness/lanyard/lifeline • Air horn, Radios • Stokes basket Inspection Requirements: • Prior to entry • Continuous throughout activities • Each shift • Entry permit	Chemical exposure Use PPE and respiratory equipment. Conduct air monitoring prior to and during confined space activities. Establish action levels based on anticipated hazards.
	Poor ventilation Use a blower or negative air machine to circulate or introduce air into confined space.
	Asphyxiation Work only in areas that contain 20-23.5% oxygen (regardless of level of protection).
	Worker down

	Use the buddy system. Have two standby personnel. Set up extrication means prior to start of activities. Set up means of communication among confined space entry team. Assigned rescue personnel must have rescue training. All moving parts and machinery in confined space will be lockout/tagout or isolated. Rescue personnel shall only attempt a rescue in SCBAs.	
	Explosion Use explosion proof lighting/equipment in potentially flammable atmospheres. Do not work in confined space where LEL is 10 percent or greater.	

Hazardous Energy and Hazardous Material Sources	Potential Hazards	Control Measures

Equipment to be Used: • Ground Fault Circuit Interrupter (GFCI) • Double-insulated tools • Generator Inspection Requirements: • Prior to start-up	Fire Electrocution Electrical burns Maintain a minimum distance of 20 feet between electrical lines and any part of equipment. Portable electrical tools and equipment will be double insulated. Portable fire extinguishers rated 10A: 20BC will be kept on site. Workers will not handle electrical equipment or wires if their hands are wet or they are standing on wet surfaces. Electrical cords shall be pulled from the outlet by the plug, not the electrical cord. Identify the location of underground/overhead electrical lines in the work area, as appropriate. Power tools shall be tagged and removed from service when not functioning properly. Lockout/tagout procedures shall be implemented when employees need to perform repair or maintenance on electrical equipment where the unexpected energization or

	start-up of stored energy could cause injury. • Worn or frayed extension cords shall be replaced. • All electrical wiring and equipment shall be a type listed by Underwriters Laboratories or another recognized listing agent for the specific application. • Before work begins, the Project Manager shall ensure by inquiry, observation, or instruments that any part of an electric power circuit will not bring any person, tool, or machine into contact with it. • Extension cords shall not be fastened with staples, hung from nails, or suspended by bare wire.	

Poisonous Plants	Potential Hazards	Control Measures
Equipment to be Used: • Topical ointment • Clothing for barrier Inspection Requirements: • Daily	Allergic Reaction Dermatitis Post areas that have been identified with poisonous plants. Avoid contact with these plants to the extent possible. Wear clothing or coveralls with long sleeves. Promptly wash clothing that has contacted poisonous plants. Wash affected areas immediately with soap and water. Apply ointment to affected areas. Inform HS and Project Manager if hypersensitivity allergic reactions to a certain plant is known.	

Animals and Poisonous Snakes	Potential Hazards	Control Measures
Equipment to be Used: • 911 or 7-6211 Inspection Requirements: • Daily • Prior to entry • During work activities	Rabies Hantavirus Bites Allergic Reaction	Inspect area for rat or mice feces or odor of urine. If not enter the affected area and notify site contact (as the site specific safety plan) immediately. Keep work areas clear of vegetation and small brush Avoid placing hands or feet into obscure areas (i.e., rocks, well pads, brush piles). Wear rubber or PVC boots into vegetated areas whe poisonous snakes or animals inhabit. Use the buddy system. Postpone work in areas where poisonous snakes or nested. Inspect protected areas before entering. Inform HS and Project Manager if allergic to bites, ar emergency kit as required.

Insect Hazards	Potential Hazards	Control Measures
Equipment to be Used: • Insect repellant Inspection Requirements: • Daily • Prior to entry • During work activities	Ticks Wear light colored clothing (can see ticks better). Mow vegetated and small brush areas. Wear insect repellant. Wear long sleeves and long pants. Visually check oneself promptly and frequently after exiting the work area.	

	Bees, wasps, ants Identify infested areas to the Site Supervisor. Workers who are allergic or capable of allergic reactions to bee, wasp, or ant stings or bites shall notify their Supervisor(s). Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.

Radiological Hazards	Potential Hazards	Control Measures
Equipment to be Used: • Radiation Dosimeter Inspection Requirements: • General work areas.	Loss of radiation source Radiation exposure. Accidental release of radiation source. ALARA (as low as reasonably achievable) principle to govern use of gauges. Operators are to maintain maximum allowable distance at all times.	

Extended Work Shifts/Multiple Crews	Potential Hazards	Control Measures
Equipment to be Used: • Multiple Crews • Portable lights Inspection Requirements: • Employee fatigue • Availability of work space	Fatigue Reduced productivity. Increased incident potential. Increased hazard exposure potential. Inattention due to familiarity/ relaxing of precautions.	No employee or contractor is authorized to work are overly fatigued. If driving a motor vehicle (non-CMV) is part of th assignment, then workers will not work more tha in a 24-hour period. Heavy equipment will not be operated by one in more than 10 hours in any 24 hour period withou minimum of 8 hours off duty. Employees experiencing negative effects of exte shifts shall be instructed to rest off duty for a suf period to eliminate the negative effects. Operators which may extend shifts beyond 10 h day, six days a week or which will have multiple operating shall be reviewed by the Site HS Coo

Adverse Weather	Potential Hazards	Control Measures

Equipment to be Used: • Radios • Shelter Inspection Requirements: • Throughout work activities	Lightning Strikes	Whenever possible, halt activities and take cover. If outdoors, stay low to the ground, but limit the body area that is in contact with the ground (i.e., kneeling knee is better than laying on the ground). Seek shelter in a building if possible. Stay away from windows If available, crouch under a group of trees instead of tree. Keep 6 feet away from tree trunk if seeking shelter b tree(s). If in a group, keep 6 feet of distance between people Suspend drill rig/crane operations if thunderstorm/lig immediate vicinity.
	Tornadoes Thunderstorms Listen to the radio or TV announcements for pending weather information. Cease field activities during thunderstorm or tornado warnings, as directed by the Project Manager. Seek shelter. Do not try to outrun a tornado. Do not stand near windows or door glass.	
	Earthquakes	

	• Seek immediate shelter (i.e., door jambs, desks, etc). • Do not stand near windows or door glass.	

Sanitation and Housekeeping	Potential Hazards	Control Measures
Equipment to be Used: • Trash containers • Hand tools Inspection Requirements: • Daily	• Slip, trip, fall • Fire • Personal illness	• Personnel will clean-up the work site daily and dispo • Refuse containers or bins will be readily available or • Provide adequate storage for tools and equipment. • Provide adequate lighting in all work areas. • Provide adequate ventilation in all work areas. • Work areas and floors shall be kept clear of debris. • Materials shall not be stacked higher than 6 feet. • Provide stools, ladder where workers need to access storage areas. • Protruding nails in scrap boards, planks, and lumber removed, hammered in, or bent over flush with the w • Weeds and grass shall be kept down. • Flammable materials shall be placed in approved fla storage containers.

Illumination	Potential Hazards	Control Measures
Equipment to be Used: • Portable lights/light towers Inspection Requirements: • General HazCom	• Eye strain/fatigue. • Increased injury/ incident potential due to lowered visual acuity.	• Minimum of 5 foot-candles required.

APPENDIX V

LANL TASK SPECIFIC SAFETY PLAN

LOS ALAMOS SITE SPECIFIC SAFETY PLAN

NATIONAL LABORATORY LEGACY MATERIALS WORK-OFF PROJECT

Important: The goal of this site safety plan is to ensure safety to personnel and the environment. This plan is designated to meet the requirements outlined in 29CFR1910.120.

1. Site Descriptions				
Date	Time	Mail Stop	Group	Division
Technical Area	Building		Room	
Generator	Telephone Number		CWDR Number	

2. Work Area: *Check appropriate box(es)*		
 Storage Room	 Indoors	 Eyewash
 Radiation Area	 Outdoors	 Safety Shower
 Loading Dock	 Telephone Nearby	 Emergency Exit Route
 Shed	 Fire Extinguisher	
 Laboratory		
 Other _____		

3. Type of Work To Be Performed: *Check box(es)*		
 Labpacking	 PCBs	 Asbestos
 Overpacking	 Gas Cylinders	
 Repacking	 Mixed Waste	
 Bulk Drum Handling	 Hazardous Waste	
 Other _____	 Low-Level Radioactive	

4. Special Hazards To Be Concerned With: *Check box(es)*		
 Fire Risk	 Biohazard	 Tripping Hazards
 Shock Sensitive	 Unknown	 Extreme Temperatures
 Corrosive Bases	 Poisons	
 Corrosive Acids	 Inhalation Hazards	
 Radiation *(If yes, beta, gamma, alpha, neutron, or x-ray?)*		
 Other _____		

5. Personal Protective Equipment

The following levels of protection will be adequate for performing this/these task(s)? (*NOTE: At a minimum, level D protection is required):*

 Level D Standard uniform/coveralls, safety shoes/boots, safety glasses/goggles, chemical-resistant gloves.

 Level C Full-face air-purifying respirator, chemical-resistant clothing, boots, and inner and outer gloves.

Level B Full-face, SCBA, chemical-resistant clothing, boots, and inner and outer gloves.

Level A SCBA, full-encapsulating chemical-resistant suit, chemical-resistant boots and gloves .

6. Emergency Evacuation Route and Safety Equipment Location Sketch
Show the following: Eyewash, safety shower, fire extinguisher, telephone, evacuation route, and muster area.

7. Important Telephone Numbers	
Emergency 911 or 667-6211 (from Cellular Telephone) Spills 667-6211 Medical Assistance 667-0660 Industrial Hygiene 665-4427	Operational Safety 667-4644 Radiation Protection 667-7137 EM-SWO 665-6158 Environmental Protection 667-5021

8. Certification			
All EM-SWO or subcontractor personnel have reviewed this site safety plan prior to commencing work and are familiar with its provisions.			
Site Supervisor (*Print Name*)	Signature	Group	Date
Other Site Personnel	Signature	Group	Date
Other Site Personnel	Signature	Group	Date
Other Site Personnel	Signature	Group	Date
Other Site Personnel	Signature	Group	Date

APPENDIX VI

Emergency Contact List

EMERGENCY CONTACT LIST

LEGACY MATERIALS WORK-OFF PROJECT

Emergency Management and 667-6211

Response (EM&R) (HAZMAT)

Emergencies (Fire, Medical Emergency, Spills) - EM&R 911, or

667-6211

if from cellular phone

Minor Injuries, First Aid On-Site - LANL Occupational Medicine 667-0660

Poison Control Center 1-800--432-6866

Spill Reporting (>=Reportable Quantity only) 911, or

667-6211

if from cell phone

PROJECT PERSONNEL NUMBERS

Tim Sloan EM-SWO Project Lead 665-8663

996-0990 (pager)

Steve Holmes LM Field Team I Lead 667-7921

996-0283 (pager)

John Pieniazek LM Field Team II Lead 699-1589 (cell.)

996-3471 (pager)

662-1200 (IT)

Darla Jo Huff LM Technical Reviewer 667-5951

Don (Quatro) Baker LM Technical Reviewer 667-5144

Jim Matzke EM-SWO 665-8300

996-0985 (pager)

LOS ALAMOS NATIONAL LABORATORY
Operated by the University of California for the U.S. Department of Energy
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