

LAWRENCE LIVERMORE NATIONAL SECURITY, LLC

ENVIRONMENT, SAFETY, AND HEALTH (ES&H) PROVISIONS

The following clauses shall apply to any work and other activities performed by the Subcontractor or its lower-tier subcontractors under this Subcontract at any U.S. Government location managed or operated by Lawrence Livermore National Security, LLC (hereinafter “LLNS”), including the Lawrence Livermore National Laboratory (hereinafter “LLNL” or “Site 200”) and its Site 300 and, unless otherwise indicated, at any other performance locations except Subcontractor or lower-tier subcontractor facilities.

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1. GENERAL

1.1.1 Definitions

- a. **Competent Person.** A person capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
- b. **Documented Attachment Point.** An attachment point that is clearly identified by the manufacturer, vendor, or engineer as a lifting point.
- c. **ES&H Submittals.** Subcontractor submittals describing how the Subcontractor will ensure the safety of all persons, property, and the environment in accordance with these ES&H Provisions and applicable laws and regulations. ES&H Submittals include, without limitation, the JHA, the Safety Plan, Task-Specific Submittals, and Subcontractor training records.
- d. **Hazardous Materials.** A substance or material capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The term includes hazardous substances, hazardous waste, marine pollutants, elevated temperature materials, and other materials designated as hazardous. As defined for Packaging and Transportation, refer to 49 CFR 171.8.
- e. **Hazmat Employee.** A person who is employed on a full-time, part time, or temporary basis by a hazmat employer who directly affects hazardous materials transportation safety or handles hazardous materials during the course of employment; or may be self-employed (including an owner-operator of a motor vehicle, vessel, or aircraft) transporting hazardous materials in commerce who in the course of such self-employment directly affects hazardous materials transportation safety; or may be a railroad signalman or railroad maintenance-of-way employee. As defined for Packaging and Transportation, refer to 49 CFR 171.8.
- f. **Job Hazard Analysis (JHA).** An ES&H Submittal that is facilitated by LLNS and is designed to facilitate a structured, task-based approach to identifying and analyzing the tasks, hazards, and controls necessary to safely perform the work.
- g. **Motor Carrier.** A for-hire motor carrier or a private motor carrier which includes, but is not limited to, a motor carrier's agent, officer, or representative; an employee responsible for hiring, supervising, training, assigning, or dispatching a driver; or an employee concerned with the installation, inspection, and maintenance of motor vehicle equipment and/or accessories.
- h. **Safety.** For the purposes of these specifications, the term "safety" encompasses the environment, safety, and health, including pollution prevention and waste minimization.
- i. **Safety Plan.** A Corporate or site-specific ES&H Submittal that documents the Subcontractor's approach to complying with these ES&H Provisions and applicable ES&H laws and regulations.
- j. **Securement.** Load placement (e.g., securing with cargo straps in a transport vehicle, installing anchor bolts for a column, or fastening to another component prior to rigging removal).
- k. **Subcontract Technical Representative (STR).** A LLNS employee responsible for the contract-related elements of a Subcontracted Work Activity, such as coordinating submittals and communication with the Subcontractor, assuring inspection/acceptance of services or products, and Subcontract Close-out. The STR is a LLNS Technical Representative and will represent LLNS in matters relating to the technical performance of the work.
- l. **Subcontractor or Employees.** Includes the Subcontractor and all lower-tier subcontractors and their respective employees.

- m. **Subcontractor Area Hazards Control List (SAHCL).** A document completed by LLNS that identifies hazards present in the Subcontractor's work area.
- n. **Undocumented Attachment Point.** An attachment point that is not identified as a lifting point by the manufacturer, vendor, or engineer in writing.

1.1.2 Reference Standards (current edition unless otherwise stated)

- a. 17 CCR §93404-93405 – *Regulation for the Reporting of Criteria Air Pollutants and Toxic Air Contaminants (CTR).*
- b. 10 CFR 851 – *Worker Safety and Health Program.*
- c. 29 CFR 1910 – *Safety and Health Regulations for General Industry.*
- d. 29 CFR 1910.95 – *Occupational noise exposure.*
- e. 29 CFR 1910.101 – *Compressed gases (general requirements).*
- f. 29 CFR 1910.134 – *Respiratory protection.*
- g. 29 CFR 1910.140 – *Personal fall protection systems.*
- h. 29 CFR 1910.147 – *The control of hazardous energy (lockout/tagout).*
- i. 29 CFR 151 – *Medical services and first aid.*
- j. 29 CFR 1910.269 – *Electric Power Generation, Transmission, and Distribution.*
- k. 29 CFR 1910.333 – *Selection and use of work practices.*
- l. 29 CFR 1910.1053 – *Respirable crystalline silica.*
- m. 29 CFR 1910 Subpart N – *Materials Handling and Storage.*
- n. 29 CFR 1910 Subpart S – *Electrical.*
- o. 40 CFR 84 – *Phasedown of Hydrofluorocarbons.*
- p. 49 CFR 171-185 Subchapter C – *Hazardous Materials Regulations*
- q. 49 CFR 350-399 Subchapter B – *Federal Motor Carrier Safety Regulations*
- r. ACGIH TLV/BEI (2016) – *TLVs and BEIs: Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices.*
- s. ANSI Z49.1 – *Safety In Welding, Cutting, And Allied Processes.*
- t. ANSI Z136.1 – *American National Standard for Safe Use of Lasers.*
- u. ANSI Z358.1 – *American National Standard for Emergency Eyewash and Shower Equipment.*
- v. ANSI/ASSE Z88.2 – *Practices for Respiratory Protection.*
- w. ANSI/ISEA 107 – *American National Standard for High-Visibility Safety Apparel.*
- x. ANSI/ISEA Z87.1 – *American National Standard for Occupational and Educational Personal Eye and Face Protection Devices.*
- y. ANSI/ISEA Z89.1 – *American National Standard for Industrial Head Protection.*
- z. ASME B30.23 – *Personnel Lifting Systems.*
- aa. ASTM F2413 – *Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear.*
- bb. California Code §4216.2 – *Regional Notification Center System.*
- cc. Caltrans MUTCD – *Caltrans Manual on Uniform Traffic Control Devices.*
- dd. DOE O 442.1B – *Department of Energy Employee Concerns Program.*
- ee. DOE O 442.2 – *Differing Professional Opinions for Technical Issues Involving Environmental, Safety, and Health Technical Concerns*
- ff. DOE O 460.1D – *Hazardous Materials Packaging and Transportation Safety.*

gg. DOE O 460.2B – *Departmental Materials Transportation and Packaging Management*.
hh. NFPA 70E – *Standard for Electrical Safety in the Workplace*.

1.2 PROGRAM POLICY

- 1.2.1 Non-construction work by the Subcontractor and its lower-tier subcontractors at LLNL is subject to the specified requirements and cited regulations. If there is a conflict between requirements, apply the most stringent requirement unless otherwise directed by LLNS.
- 1.2.2 Assist LLNS and the Department of Energy (DOE) National Nuclear Security Administration (NNSA) in complying with applicable environment, safety, and health (ES&H) regulations. Do not construe anything in this part as relieving a Subcontractor from complying with additional specific safety and health requirements that it determines to be necessary to protect the safety and health of workers.
- 1.2.3 Perform work in a manner consistent with LLNS' commitment to be a responsible steward of the environment. Comply with all applicable environmental regulations and incorporate pollution prevention, waste minimization and resource conservation practices into the planning and performance of the work.
- 1.2.4 Integrate ES&H into work planning and execution (derived from Contract No. DEAC52-07NA27344, modification No. 793, section I-091 DEAR 970.5223).
 - a. Perform work safely, in a manner that ensures adequate protection for employees, the public, and the environment. The Subcontractor is accountable for the safe performance of work and for exercising a degree of care commensurate with the work and the associated hazards. Ensure that management of ES&H functions and activities becomes an integral, but visible, part of the Subcontractor's work planning and execution process. Ensure the following:
 - (1) Line management is responsible for the protection of employees, the public, and the environment. Line management includes those subcontractor employees managing or supervising employees performing work.
 - (2) Clear and unambiguous lines of authority and responsibility for ensuring ES&H are established and maintained at all organizational levels.
 - (3) Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities. Remove employees from work under the Subcontract if they are determined to be careless, incompetent, unfit for duty or otherwise objectionable to the Subcontractor or LLNS.
 - (4) Resources are effectively allocated to address ES&H, programmatic, and operational considerations. Protecting employees, the public, and the environment is a priority whenever activities are planned and performed.
 - (5) Before work is performed, evaluate the associated hazards, and establish an agreed-upon set of ES&H standards and requirements which, if properly implemented, provide adequate assurance that employees, the public, and the environment are protected from adverse consequences.
 - (6) Implement administrative and engineering controls to prevent and mitigate hazards that are tailored to the work being performed. Place emphasis on designing the work and/or controls

to reduce or eliminate the hazards and to prevent accidents and unplanned releases and exposures. Select hazard controls based on the following hierarchy:

- (a) Elimination or substitution of the hazards where feasible and appropriate,
 - (b) Engineering controls where feasible and appropriate,
 - (c) Work practices and administrative controls that limit worker exposures, and
 - (d) Personal protective equipment.
- (7) The conditions and requirements are satisfied so operations may be initiated and conducted as established and agreed-upon by LLNS and the Subcontractor. These agreed-upon conditions and requirements are requirements of the subcontract and binding upon the Subcontractor. Tailor the extent of documentation and level of authority of the agreement to the complexity and hazards associated with the work and as required by the subcontract.
- b. Manage and perform work in accordance with conditions in this specification and follow these overarching attributes:
- (1) Define the scope of work.
 - (2) Identify and analyze hazards associated with the work.
 - (3) Develop and implement hazard controls.
 - (4) Perform work within controls.
 - (5) Provide feedback on adequacy of controls and continue to improve safety management.
- c. Provide feedback to the LLNS Subcontract Technical Representative (STR), when requested and without limitation. This feedback may include a self-assessment of the Subcontractor's performance relative to the ES&H requirements of this subcontract. (Note that the terms "STR" and LLNS Technical Representative or "TR" are used synonymously throughout the subcontract documents, including all incorporated documents.)
- d. Comply with, and assist LLNS in complying with, ES&H requirements of applicable laws and regulations identified in this subcontract. Cooperate with federal and non-federal agencies having authority over ES&H matters under this subcontract in coordination with LLNS.
- e. Promptly evaluate and resolve noncompliance occurrences with applicable ES&H requirements. If the Subcontractor fails to provide resolution or if, at any time, the Subcontractor's acts, or failure to act causes substantial harm or an imminent danger to the environment or health and safety of employees or the public, LLNS may issue an order stopping work in whole or in part. Stop work order issued by LLNS under this clause are without prejudice to other legal or contractual rights of the Government. If LLNS issues a stop work order, an order authorizing the resumption of the work may be issued at the discretion of LLNS. The subcontractor is not entitled to an extension of time or additional fee or damaged by reason of, or in connection with, work stoppage ordered in accordance with this subcontract.
- (1) If LLNS directs the Subcontractor to execute either a corrective action plan or compensatory measures due to safety incidents at LLNL for other projects, the Subcontractor must implement these plans and measures on-site for like work under other subcontracts regardless of whether they are serving as a LLNS subcontractor or a lower-tier subcontractor to the LLNS subcontractor.
- f. Regardless of the performer of the work, the subcontractor is responsible for compliance with the ES&H requirements applicable to this Subcontract. The Subcontractor is responsible for flowing

down the ES&H requirements applicable to this contract to lower-tier subcontracts to the extent necessary to ensure the subcontractor's compliance with the requirements.

- g. Include a clause substantially the same as what is stated in this section in lower-tiered subcontracts involving complex or hazardous work. Provide for the right to stop work under the conditions described in this section. Depending on the complexity and hazards associated with the work, the subcontractor may choose not to require lower-tier subcontractor to submit a corporate safety plan, or similar, for the subcontractor's review and approval.

1.3 EMPLOYEE CONCERNS PROGRAM, DIFFERING PROFESSIONAL OPINIONS

1.3.1 Comply with Department of Energy (DOE) DOE O 442.1B, *Department of Energy Employee Concerns Program*. The following paragraphs outline the implementation of this program by LLNS.

1.3.2 The Employee Concerns Program encourages the free and open expression of reporting Employee Concerns. This program provides an independent and formal avenue for subcontractor employees to raise Employee Concerns in support of a Safety Culture where Employee Concerns can be promptly identified and resolved without fear of retaliation/reprisal. Employee concerns include:

- a. An activity, policy, or practice of DOE or subcontractor - including but not limited to, that which is related to the environment, safety, health, security, quality, and management of DOE facilities and/or operations—should be improved, modified, or terminated; or
- b. Being subjected to Harassment, Intimidation, Retaliation, or Discrimination (HIRD) (as defined in DOE O 442.1B) by DOE, or subcontractor, for raising an Employee Concern.

1.3.3 Subcontractor employees may raise concerns, including information about a violation or *potential* violation, in accordance with the following steps:

- a. Subcontractor employees are encouraged to seek resolution through local complaint or alternative dispute resolution systems, or with first line supervisors, but alternatively, they have the right to report Employee Concerns through the Employee Concerns Program.
- b. Report concerns to the LLNS Employee Concerns Program by using one of the following avenues:
 - (1) Mail: ECP, LLNL; 7000 East Ave / PO Box 808; Livermore, CA 94550 / 94551
 - (2) Email: EmployeeConcernsProgram@llnl.gov
 - (3) Employee Concerns Program Advisory Line: 925-422-3270
 - (4) Hotline Phone: 877-631-0018 (anonymous option)
 - (5) Hotline Website: <https://llnl.alertline.com/gcs/welcome> (anonymous option)
- c. Or concerns may be reported to the LLNS Employee Concerns Program by using one of the following avenues:
 - (1) Employee Concerns Program: 844-799-8855
 - (2) DOE Employee Concerns Website: <https://www.energy.gov/ehss/doe-employee-concerns-program>

1.3.4 Include information about the violation, where and when the issue occurred, who may have witnessed the issue and other details to provide clarity of the situation.

1.3.5 Inform subcontractor employees of their right and ability to report concerns.

- 1.3.6 Comply with DOE O 442.2, *Differing Professional Opinions* for Technical Issues Involving Environmental Safety and Health. The following paragraphs outline the implementation of these programs by LLNS.
- 1.3.7 The differing professional opinions (DPO) process encourages and facilitates dialogue and resolution on DPOs from Subcontractor employees regarding ES&H technical issues. The intent of this process is not to circumvent other avenues for resolving technical disagreements, but rather to supplement existing processes for assessing and addressing technical issues related to ES&H. This process may require LLNS to stop or curtail work operations to place the facility or activity in a safe condition until the DPO issue has been resolved.
- 1.3.8 Subcontractor employees with knowledge of an ES&H related technical issue or activity at LLNL that they believe is not being properly addressed should raise the issue in accordance with the following instructions to ensure it is properly considered in a timely manner. The National Nuclear Security Administration (NNSA), the DOE agency that oversees LLNL operations, uses the term “submitters” to refer to Subcontractor employees who submit DPOs. As a submitter, comply with the following:
- a. First, seek resolution through readily available processes, such as discussions with first-line supervisors, or the review and comment processes.
 - b. If not resolved through a readily available process, submit DPO issues in writing to the attention of the LLNS contract analyst, or directly to the NNSA Laboratory Field Office (LFO). The following information is required:
 - (1) Summary of position, including proposed or established practice
 - (2) Recommended action
 - (3) Assessment of consequences and technical basis for concern
 - (4) Recommended technical experts
 - (5) Relevant documentation for review
 - (6) Explain attempts to resolve issue prior to submitting a DPO
 - (7) Identify the NNSA facility and activity
 - c. Submit written DPO issues to the following address: DPO Manager, NNSA/LFO Chief of Staff; NNSA – Livermore Field Office, L-293; 7000 East Avenue / P.O. Box 808; Livermore, CA 94550 / 94551
 - d. If requested, meet with ad hoc panels and managers, and provide known information to support a thorough review of the concern.
- 1.3.9 Inform employees of their right and ability to report concerns on technical issues relating to ES&H through the DPO process.
- 1.3.10 Extend the requirements of this subpart to lower-tier subcontractors to ensure the lower-tier subcontractor’s compliance with the requirements and the safe performance of work.

1.4 SUBCONTRACTOR SAFETY PROGRAM

- 1.4.1 The Subcontractor is solely responsible for initiating, maintaining, and supervising safety provisions, precautions, and programs during the performance of the Subcontract.
- 1.4.2 Management Responsibilities and Worker Rights

- a. Assign worker safety and health responsibilities, evaluate personnel performance, and hold personnel accountable for worker safety and health performance.
- b. Use qualified worker safety and health professionals (e.g., certified industrial hygienist or certified safety professional) as required by these specifications.
- c. Provide workers with access to information relevant to the worker safety and health, including:
 - (1) The Subcontractor's corporate safety plan, job hazard analysis (JHA), and other relevant health and safety information applicable to the work.
 - (2) Applicable injury/illness information from OSHA No. 300 and 300A forms (or California State equivalents), subject to Freedom of Information Act restrictions.
 - (3) LLNS provided health and safety information and publications.
 - (4) LLNS provided 10 CFR 851 worker's rights poster, to be posted at the jobsite.
- d. Provide measures for workers to report, without reprisal, job-related fatalities, injuries, illnesses, incidents, and hazards and make suggestions for mitigating hazards. Promptly respond to such reports and suggestions.
- e. Inform workers of their rights, which include the following:
 - (1) Access to health and safety information.
 - (2) Notification of exposure monitoring results.
 - (3) Right to observe monitoring and receive the results of their own exposure monitoring.
 - (4) Express concerns related to worker safety and health.
 - (5) The right to stop work or decline to perform an assigned task based on a reasonable belief that the task poses an imminent risk of death, serious physical harm, or other serious hazard in circumstances where there is insufficient time to use normal hazard reporting procedures.

1.4.3 Hazard Assessment and Prevention

- a. Address hazards identified in the Subcontractor Area Hazards Control List (SAHCL), the Subcontractor's corporate safety plan, and the JHA.
- b. The Subcontractor's workers, including lower-tier subcontractors, are required to acknowledge being informed of the hazards and protective measures associated with assigned work activities. After the safety orientation submit an attendance roster with employee signatures verifying that each employee understands the safety plan and ensure that the attendance roster is always available at the jobsite.
- c. Instruct workers to report hazards not previously identified or evaluated to the Subcontractor's designated representative. If immediate corrective action is not possible or the hazard falls outside of project scope, immediately notify affected workers, post appropriate warning signs, implement needed interim control measures, and notify LLNS of the action taken. Stop work in the affected area until appropriate protective measures are established.
- d. Establish and document procedures for routinely assessing workplace hazards produced from chemical, biological, and safety hazards at the jobsite.
- e. Implement a hazard prevention and abatement process to ensure prompt abatement of identified and potential hazards at the jobsite.

1.5 RECORDKEEPING AND REPORTING

- 1.5.1 Reporting requirements specified in this section are in addition to and do not replace the Subcontractor's obligations for injury and illness reporting or recordkeeping per OSHA requirements.
- 1.5.2 Report OSHA recordable fatalities, injuries and illnesses involving the Subcontractor and lower-tier subcontractor personnel and property damage to the STR immediately (**within one hour of incident**). Also, conduct an incident investigation and submit a complete written report on DOE Form 5484.3 to the TR within one calendar day of the incident. LLNS may perform its own investigation (see Injury and Illness Reporting Provisions for details). If an injury is involved, provide a daily verbal and written update to the TR until the claimant is released to full duty and/or claim has been resolved. Retain and maintain work activity records in accordance with applicable state and federal requirements.
- 1.5.3 Follow the injury and illness reporting requirements found in the following applicable provision document (available at <https://supplychain.llnl.gov/supplier-information/general-provisions-and-forms>):
 - a. Injury and Illness Reporting Provision, or
 - b. Injury and Illness Reporting with Quarterly Updates Provisions
- 1.5.4 Provide personal/area sampling results and reports to the STR as soon as they become available.
- 1.5.5 Retain the following records. LLNS may request these for review:
 - a. Personal/area sampling results and reports, and periodic inspections, including person(s) conducting the inspection, the unsafe conditions and work practices identified, and actions taken to correct the unsafe conditions or work practices.
 - b. Documentation of ES&H training for each employee, including employee name or other identifier, training dates, type(s) of training, and training providers.
 - c. Documentation of readiness to work, such as training records for crane operators or designated competent persons, medical qualifications, or certification of HEPA filter systems.
 - d. Supplemental documentation as required by these specifications or the JHA, such as lift plans, lockout/tagout (LOTO) plans, excavation plans, fall protection, etc.

1.6 SUBMITTALS

- 1.6.1 Furnish submittals electronically as directed by the LLNS Subcontract Technical Representative (STR). Do not begin work related to or impacted by a submittal until LLNS has approved that submittal, or the STR has provided written direction to proceed.
- 1.6.2 LLNS will make the final determination on the acceptability of submittals. If LLNS determines the Subcontractor's submittal is incomplete or unacceptable, the STR will return it to the Subcontractor. LLNS approval of submittals does not relieve the Subcontractor from responsibility for errors or omissions in such submittals or from responsibility for complying with the requirements of this subcontract, applicable laws, or regulations. The Subcontractor is not entitled to a cost or schedule adjustment due to failure to submit acceptable submittals or submittals that were later found to be inadequate and require correction and re-approval.
- 1.6.3 Keep one copy of approved submittals for LLNS use at the jobsite in hard copy or electronic format.

- a. Job Hazard Analysis (JHA): Use the LLNS-provided JHA template. Begin JHA development with a clearly defined scope of work that is broken down into a series of tasks. Describe each task, the hazards associated with each task, and the controls used to mitigate those hazards by following the hierarchy of controls:
 - (1) Elimination or substitution of the hazards where feasible and appropriate,
 - (2) Engineering controls where feasible and appropriate,
 - (3) Work practices and administrative controls that limit worker exposures, and then
 - (4) Personal protective equipment
- b. Corporate Safety Plan/Program: Documentation of the Subcontractor's general approach to ES&H, in writing, including specific program information as identified in this specification section. The corporate safety plan must include the items listed below:
 - (1) Names and contact information for the person(s) with authority and responsibility for implementing the plan at LLNL.
 - (2) Roles and responsibilities.
 - (3) Description of the system used for ensuring employees comply with safe and healthy work practices (e.g., employee recognition, training, disciplinary actions).
 - (4) Description of the system for communicating with employees on matters relating to ES&H, including provisions designed to encourage employees to inform management of hazards at the work site without fear of reprisal (e.g., reporting procedures, meetings, training, postings, anonymous notifications, corrective action tracking and close-out).
 - (5) Procedures used to identify and evaluate workplace hazards, including scheduled periodic inspections to identify unsafe conditions and work practices (e.g., JHA, inspections, permit compliance, personal or area sampling). Include procedures that describe what to do if new hazards are identified during work that were previously not assessed.
 - (6) Procedure for reporting and investigating occupational injury or occupational illness that complies with applicable regulations and the specified requirements.
 - (a) Follow the injury and illness reporting requirements found in the following applicable provision document included in this subcontract:
 - i. Injury and Illness Reporting Provision, or
 - ii. Injury and Illness Reporting with Quarterly Updates Provisions
 - (b) The required actions identified in the above provisions are in addition to and do not replace the Subcontractor's obligations for injury and illness reporting or recordkeeping per OSHA requirements.
 - (7) Methods or procedures for correcting unsafe or unhealthy conditions, work practices, and work procedures in a timely manner based on the severity of the hazard.
 - (8) Description of how all required training is delivered and maintained and complies with the specified requirements.
 - (9) Specific emergency response information describing methods of compliance with this specification, including identification and contact information for the chosen local medical provider.

- (10) Implementation of comprehensive occupational medicine program for workers stationed at an LLNL jobsite for more than 30 days per year or who are enrolled in a medical monitoring program required by regulations.
- (11) Describe who records are delivered to, how records are maintained, and the retention period for at least the following:
 - (a) Periodic inspections and personal/area sampling results, including the person(s) conducting the inspection, the unsafe conditions and work practices that have been identified and action taken to correct the identified unsafe conditions and work practices.
 - (b) Documentation of ESH training for each employee, including employee name or other identifier, training dates, type(s) of training, and training providers.
 - (c) Documentation of readiness to work, such as training records for crane operators or designated competent persons, medical qualifications, or certification of HEPA filter systems.
 - (d) Supplemental documentation as required by these specifications or the Job Hazard Analysis (JHA) such as, lift plans, lockout/tagout (LOTO) plans, etc.
 - (e) Personal/area sampling results and reports. This data must be delivered to the STR as soon as the results are available.
- (12) Other program or hazard-specific requirements defined in Part 2 of these provisions.

1.7 SUBCONTRACTOR TRAINING PROGRAM

- 1.7.1 Employee Orientation Training: Provide orientation training for every employee (including lower tier subcontractors) working on the jobsite covering the various safety policies, safety manuals, first aid availability, accident reporting procedures, emergency procedures (notification procedures, evacuation routes, mustering points, and accountability), safety meeting participation, personal protective equipment (PPE), enforcement procedures, and applicable LLNS-specific requirements.
- 1.7.2 Supervisor/Employee Safety Training: Provide training to supervisors covering record keeping, incident reporting and investigation, OSHA inspections, health, and safety documentation requirements. In addition, provide training to employees (and lower-tier subcontractors) on hazards and protective measures (e.g., OSHA 10-hour course).
- 1.7.3 Competent and Qualified Person Training: Operations requiring a competent or qualified person in accordance with OSHA requirements, such as powered platforms, manlifts, and vehicle-mounted work platforms for building maintenance; explosives and blasting agents; slings; etc.

1.8 EMERGENCIES

- 1.8.1 In an emergency affecting the safety of persons or property, immediately call the LLNL Emergency Dispatch Center by dialing 911 from an LLNL system phone or 1-925-447-6880 from a non-LLNL phone or cellular phone. Take action to prevent or minimize damage, injury, or loss without risking personal safety. Preserve the integrity of the scene for investigation.
- 1.8.2 Notify the STR of the occurrence of such an emergency or off normal event and actions taken within 1 hour. If the STR is not available, contact the LLNS contract analyst in Procurement. This notice may be oral but must be followed by a written confirmation.

1.8.3 Subcontractor employees seeking access to the jobsite must complete Emergency Preparedness Protective Action Overview training (LLNL course ID EM0001-W). Refresher training (LLNL course ID EM0001-RW) to be completed every 2 years.

1.9 ES&H REQUIREMENTS SITE 300 ACCESS

1.9.1 Subcontractor employees seeking access to the jobsite for the first time must complete the following training:

- a. Site 300 Safety Orientation (LLNL course ID DT0095-W)
- b. Valley Fever Awareness (LLNL course ID HS0096-W)

1.9.2 LLNS may require additional ES&H-related training and documentation depending upon the location of the work site.

1.10 CONTROLLED ITEMS AND MATERIALS

1.10.1 Do not use or bring the controlled items and materials listed below to any location owned or managed by LLNS without prior written approval from LLNS.

- a. Asbestos products.
- b. Beryllium or beryllium products.
- c. Carcinogens and regulated materials
- d. Materials containing mercury.
- e. Materials containing cadmium.
- f. Materials containing lead.
- g. Hazardous materials with SDS.
- h. Corrosive or toxic chemicals.
- i. Flammable or combustible liquids.
- j. Radioactive materials.
- k. Radiation generating devices.
- l. Non-ionizing radiation generating devices.
- m. Explosives.
- n. Thoriated welding rods – prohibited for welding purposes.
- o. Water pipe and fittings, lead solder and flux, and plumbing fittings and fixtures having lead content exceeding the maximum allowable level defined in the California Health and Safety Code, Section 116875.
- p. Animals.
- q. Lasers.
- r. Powder-actuated hand tools.

2. WORKER SAFETY AND HEALTH

2.1 PROTECTION OF PERSONS AND PROPERTY

2.1.1 Erect and maintain, as required by these specifications and Subcontract documents, existing site conditions, and performance of the subcontract, safeguards for safety and protection of persons and property, including, but not limited to:

- a. Lighting.
- b. Shade.
- c. Potable water.
- d. Access control to the work site using signage and/or barriers.

2.1.2 Notify the STR of conditions that could affect LLNS or other Subcontractor activities at the project site, adjacent sites, or to utilities.

2.1.3 The Subcontractor must keep the work location clean and orderly to prevent slips, trips, and falls.

- a. Keep walkways free from all obstructions.
- b. Remove accumulated debris each day.
- c. Remove all debris, excess materials, tools, equipment, temporary buildings, barricades, empty containers, etc. from the work location when the work is finished.

2.2 AERIAL LIFTS

2.2.1 Operate aerial lifts in accordance with 29 CFR 1910 Subpart F *Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms*. In addition:

- a. Use fall restraints with a body harness attached to an anchor point on the basket in all types of aerial lifts. This applies to operators and passengers.
- b. Obtain prior approval from LLNS if it is necessary to exit lifts or platforms from a height.

2.2.2 Submit the following for LLNS approval if aerial lifts will be used for work:

- a. Corporate Safety Plan that describes the Subcontractor's aerial lift safety and inspection program.
- b. Maintain operator training records and inspection records available for review at the jobsite.
- c. JHA with task specific hazards and controls.

2.3 BURIED AND HIDDEN UTILITIES

2.3.1 Before performing soil, concrete, or non-concrete wall, ceiling, or floor penetrations, notify LLNS STR to secure dig and penetration permits.

2.3.2 Notify the LLNS STR at least 14 days in advance of anticipated penetration. LLNS will determine if scanning and/or a permit is required.

2.3.3 Procedure:

- a. Permits are required for soil penetration regardless of depth. Permits may be required for other types of penetration.

- b. LLNS will perform locating surveys and will furnish available documentation for the penetration area, including drawings, survey data, and locating reports.
- c. Clearly mark penetration areas with white paint in accordance with California Code 4216.2, *Regional Notification Center System*. Confirm that these marks remain intact and clearly visible throughout the entire survey and excavation process.
- d. Mark new conduit routes and planned wall penetrations deeper than ¼ inch.
- e. Ask the LLNS STR to review and approve routing and penetration locations prior to continuing the work.

2.3.4 LLNS requires extensive planning and careful execution of all penetrations of concrete or non-concrete walls, floors, or ceilings, both interior and exterior.

- a. Required PPE - Use safety glasses with side shields and electrical hazard (EH)-rated safety shoes, or dielectric boots. In addition, use class 0 electrical gloves for penetrations where electrical over 50V is known, or suspected and cannot be located.
- b. Penetrations Greater than ¼ inch into Wall Cavities or Wood and Metal Framing:
 - (1) Use Proper Analysis Tools: Use non-conductive power or manual tools. Use standard scanners for wood with a detector for metal/wire location.
 - (2) Plan the Penetration: Check with the LLNS STR for known hazards. Layout and plan the penetration beforehand and identify hazards on both sides of the wall.
 - (3) Mark new conduit routes and wall penetrations.
 - (4) As required request the LLNS STR review and approve the routing and penetration locations prior to continuing the work.
 - (5) Identify Exterior Hazards: Surfacing material hazards such as asbestos, beryllium, lead, or other hazardous materials require additional permits, training, and PPE.
 - (6) If suspect hazardous materials are encountered, stop work, and notify LLNS.
 - (7) Identify Interior Hazards: Identify wall interior hazards such as electrical, EMT, and other ferrous or non-ferrous utilities by scanning, scoping, or cutting a view hole into the surface.
 - (a) Hand scan the area to determine location of studs, metal objects, electrical conduits, mechanical pipes, and other obstructions.
 - (b) Hand scan the area with a voltage sensitive detector for electrical circuits not in a metal conduit, such as “Romex” type wiring.
 - (c) Using non-conductive tools, poke a hole for a bore scope, or cut a view hole, at a depth equal to, but not greater than the thickness of the surface material layers.
 - (d) View inside structure with a flashlight or borescope for utilities.
- c. Relocate penetrations to avoid identified hazards.

2.4 CHEMICAL SUBSTANCES

2.4.1 The following applies to the use of all chemical substances including those with specific standards or regulations as listed within these provisions.

- a. Implement the requirements of ANSI Z358.1, *American National Standard For Emergency Eyewash And Shower Equipment* if the eyes or body of any person may be exposed to injurious

corrosive materials. At a minimum, performance requirements of this emergency equipment must meet OSHA 29 CFR 1910.151(c), *Medical Services and First Aid*. In addition:

(1) Subcontractors can request an exemption from implementation of specific ANSI Z358.1 requirements by submitting a request to the STR.

2.4.2 Implement the applicable requirements to reduce employee exposure to chemical and physical agents below limits. In addition:

a. Assemble documentation to justify and prove that employee exposure is being maintained below all applicable limits. This can be accomplished by performing monitoring activities, including the collection of personal and area samples as required by referenced standards and other requirements contained within these General Safety Provisions, and/or collecting other objective data with an explanation of applicability to the specific tasks being performed for LLNS.

(1) Maintain documentation for LLNS review at the worksite either in hard copy or electronic format. If documentation is not sufficient to LLNS reviewers, those reviewers will work through the STR to pause or stop the applicable work until the issue(s) have been resolved.

b. The subcontractor is required to allow access to the worksite by LLNS personnel for the collection of personal or area monitoring data to verify exposures. These requests will be coordinated through the STR.

2.4.3 Submit the following for LLNS approval:

a. JHA with task specific hazards and controls.

2.5 CONFINED SPACES

2.5.1 Conduct entries of permit-required confined spaces in accordance with 29 CFR 1910.146, *Permit-required confined spaces*. In addition:

a. If the Subcontractor is the sole entrant, perform the entry under the Subcontractor's confined space program using the Subcontractor's entry permit.

b. If the entry is performed jointly by LLNS and the Subcontractor, perform the entry under LLNS requirements using a LLNS entry permit.

c. In all cases, conduct a joint pre-activity walkthrough to review confined space hazards and controls.

2.5.2 Submit the following for LLNS approval if confined spaces will be entered to perform work:

a. Corporate Safety Plan containing the written confined space program including the confined space entry permit and evidence of worker training; and

b. Training records; and

c. JHA with task specific hazards and controls.

2.6 ELECTRICAL SAFETY

- 2.6.1 Qualified electrical workers are required to perform electrical work and in accordance with NFPA 70E, *Standard for Electrical Safety in the Workplace*, and 29 CFR 1910.269, *Electric Power Generation, Transmission, and Distribution*, and Subpart S, *Electrical*. In addition:
- a. If exposed energized parts are encountered where none were expected, particularly during testing of locked- and tagged-out circuits, stop work immediately and contact the LLNS STR for guidance before proceeding.
 - b. If work is required to be performed near exposed, energized equipment, then:
 - (1) Address this work in the safety plan, provide qualified personnel to perform such work, and provide necessary safety equipment.
 - (2) Notify LLNS 14 days in advance of performing the work. LLNS may provide specific guidance for performing such work.
 - c. Lock and tag electrical circuits planned for work in accordance with paragraph LOTO/TAGOUT (LOTO).
- 2.6.2 Submit the following for LLNS approval:
- a. Corporate Safety Plan containing the written Electrical Safety Program that contains details on electrical safety practices and procedures; and
 - b. JHA with task specific hazards and controls.

2.7 FALL PROTECTION

- 2.7.1 Provide fall protection at the work site in accordance with 29 CFR 1910 Subpart D, *Walking-Working Surfaces*. In addition:
- a. Warning line systems in compliance with OSHA 29 CFR 1926.502(f), *Fall Protection Systems Criteria and Practices*, must include additional warning lines or demarcation at lower levels when needed to ensure that they are visible at the employee's working level.
- 2.7.2 Submit the following for LLNS approval if active or passive fall protection is required to be used for completing work:
- a. Corporate Safety Plan that describes the fall protection program as part of the corporate safety plan; and
 - b. JHA with task specific hazards and controls; and
 - c. Training records for users and designated competent person(s); and
 - d. Description of the methodology for identifying anchor points, calculating clearance requirements, and rescue procedures, if requested by LLNS ESH reviewers and approvers.

2.8 HEARING CONSERVATION PROGRAM

- 2.8.1 Protect workers from exposure to noise by implementing the requirements of 29 CFR 1910.95, *Occupational Noise Exposure*, and the American Conference of Governmental Industrial Hygienists (ACGIH) TLV (2016) for noise. In addition:
- a. Subcontractor employees who are exposed to noise levels at or above 85 dBA for an 8- hour time weighted average (TWA) shall be enrolled in a hearing conservation program per 29 CFR 1910.95, *Occupational Noise Exposure*.

- b. Employee exposure to noise must be reduced below 85 dBA as an 8-hour TWA, or if impact/impulse noise, below 140 dBC.
- c. Engineering and/or administrative controls shall be utilized, if feasible, to protect employee exposure above these limits. When engineering or administrative controls are not feasible or fail to reduce sound levels to below these limits, hearing protective devices with the appropriate noise reduction rating (NRR) shall be provided and used.

2.8.2 Submit the following for LLNS approval if work will expose employees to noise levels at or above the limits:

- a. JHA with task specific hazards and controls.

2.9 HEPA FILTERS

2.9.1 Certify HEPA-filtered equipment (e.g., vacuum cleaners, portable exhaust ventilation units, negative-pressure machines) used for asbestos, lead, silica, or other hazardous materials every 12 months.

2.9.2 Document the certification and maintain documentation in hard copy or electronic format at the worksite for LLNS review.

2.9.3 The subcontractor shall allow LLNS access to HEPA filtered equipment to verify certification and/or check the performance of the equipment upon arrival at the site or anytime thereafter.

2.10 HOISTING AND RIGGING

2.10.1 Conduct hoisting and rigging activities in accordance with 29 CFR 1910 Subpart N, *Materials Handling and Storage*. In addition:

- a. LLNS requires the categorization and planning of lifts. See hoisting and rigging requirements in Appendix A, *Cranes, Hoists, and Rigging*.

2.10.2 Submit the following for LLNS approval if hoisting and rigging activities are necessary for work:

- a. A lift plan prior to lifts being performed. The task specific JHA can reference the requirement to develop and submit the plan. The plan does not need to be submitted for approval until before performing the lift, but the JHA must state the requirement to develop one. Qualified LLNS personnel will verify that Subcontractor hoisting and rigging operations/equipment comply with the approved lift plan prior to lifts being performed; and
- b. JHA with task specific hazards and controls.

2.11 HOT OR COLD ENVIRONMENTS

2.11.1 Protect workers from temperature stress in accordance with the American Conference of Governmental Industrial Hygienists (ACGIH) TLVs (2016).

2.11.2 Submit the following for LLNS approval if workers are at risk of developing a heat or cold related illness:

- a. JHA with task specific hazards and controls

2.12 LASER SAFETY

2.12.1 Conduct work with lasers in accordance with ANSI Standard Z136.1, *Safe Use of Lasers*.

2.12.2 Submit the following for LLNS approval if the work requires use of a 3B or greater laser:

- a. Corporate Safety Plan that contains the written Laser Safety Program; and
- b. JHA with task specific hazards and controls.

2.13 LOCKOUT/TAGOUT (LOTO)

2.13.1 LOTO is applicable if working on or near equipment or systems with energy sources as defined in 29 CFR 1910.147, *The Control of Hazardous Energy (lockout/tagout)*, 29 CFR 1910.333, *Selection and Use of Work Practices*, 29 CFR 1926.417, *Lockout and Tagging of Circuits*, or NFPA 70E, *Standard for Electrical Safety in the Workplace*. In addition:

- a. LLNS will assume primary LOTO responsibility for subcontractors. Contact the STR to coordinate with LLNS personnel to establish LOTO, perform a ZEV, and apply the first lock.
 - (1) LLNS personnel will establish LOTO on all equipment and perform the Zero-Energy Verification (ZEV) to place it in a safe working condition.
 - (2) Subcontract personnel who are LOTO authorized workers will join a group LOTO with their own individually keyed lock and associated tag after LLNS personnel have applied the first lock.
 - (3) Subcontract personnel can perform a secondary ZEV after the initial LLNS ZEV, after applying their lock(s), and before beginning work. NOTE: An NFPA 70E qualified electrical worker is required if subcontractor elects to perform a secondary ZEV and any test before touch checks on electrical equipment that has been LOTO by LLNS). This secondary verification must be done using a CAT III or higher measurement device with appropriately rated leads to test each phase conductor or circuit part before beginning work. LOTO authorized Workers joining a group LOTO are not required to observe zero energy verification but can request it.
 - (4) LLNS will be the last to remove their lock in the sequence to reenergize the equipment and/or system.
- b. Submit the following for LLNS approval if LOTO will be required to perform work:
 - (1) Written LOTO Program; and
 - (2) Training records for authorized workers; and
 - (3) Written LOTO procedure and plan (may utilize Appendix E LOTO Plan template provided by LLNS) required 14 days in advance of needing LOTO; and
 - (4) JHA with task specific hazards and controls.

2.14 MATERIAL HANDLING

2.14.1 Handle materials in accordance with 29 CFR 1910, Subpart N, *Materials Handling and Storage*.

2.14.2 Submit the following for LLNS approval if material handling is necessary for work:

- a. A material handling plan if moving large irregularly shaped, configured, or sized items (center of gravity or balance concerns) or equipment with tight installation tolerances when using forklift attachments, chain falls, come along, specialized dollies, gantry cranes or other material handling equipment. The task specific JHA can reference the requirement to develop and submit the plan. The plan does not need to be submitted for approval until before

performing the material handling task, but the JHA must state the requirement to develop one. The plan should include, but not be limited to, the following elements:

- (1) Details of the load including depictions showing manufacturer pick points if applicable.
- (2) Lifting equipment such as fork attachments, cut sheets for slings/chain falls, etc.
- (3) Lifting crew including their roles and responsibilities
- (4) Lifting method(s) including possible variations in the plan as materials may vary in dimensions and or weights.
- (5) Requirement to erect or dismantle lifting equipment, if any.
- (6) Sketch of the lifting zone showing position of lifting equipment, crew, and load.

b. JHA with task specific hazards and controls.

2.15 PERSONAL PROTECTIVE EQUIPMENT (PPE)

2.15.1 Select and use PPE required by 10 CFR 851, *Worker Safety and Health Program*, 29 CFR 1910.134, *Respiratory Protection*, and 29 CFR 1926 Subpart E: *Personal Protective and Life Saving Equipment*. Ensure that Subcontractor employees, lower-tiered subcontractors, and vendors have, inspect, and utilize required PPE.

2.15.2 Submit the following for LLNS approval if PPE is required to be worn during work:

a. JHA with task specific hazards and controls.

2.16 ROOF ACCESS

2.16.1 Access to roofs is controlled by LLNS Facility Management. If access is required, do the following:

a. Coordinate with the STR to obtain permission from local Facility Management and, if required, obtain an LLNS Roof Access Permit. Do not access roofs without the STR's authorization and Roof Access Permit, where required. If a permit is required:

- (1) Follow the requirements listed on the Roof Access Permit.

2.16.2 Submit the following for LLNS approval if roof access is required for work:

a. JHA with task specific hazards and controls.

2.17 SCAFFOLDING AND LADDER SAFETY

2.17.1 Erect, use, and disassemble scaffolding in accordance with 29 CFR 1910 Subpart D, *Walking-Working Surfaces*.

a. Ladders must be inspected by the user prior to use.

2.17.2 Submit the following for LLNS approval if scaffolding and ladder safety are applicable to the work:

- a. Corporate Safety Plan that describes how the Subcontractor will comply with the requirements for scaffolding erection, use, and disassembly; and
- b. JHA with task specific hazards and controls; and
- c. Training records for users and designated competent person(s).

2.18 SILICA

2.18.1 Protect workers from exposure to crystalline silica dust in accordance with OSHA 29 CFR 1910.1053, *Respirable Crystalline Silica*, and the ACGIH TLV (2016) when performing work generating silica dust. In addition:

- a. Follow the requirements in the LLNL Modified Table 1.
- b. HEPA vacuums used for worker protection or to clean up silica dust and/or slurry generated during concrete or asphalt disturbance shall be certified in accordance with paragraph HEPA FILTER CERTIFICATION.

2.18.2 Submit the following for LLNS approval if workers will perform tasks that have the potential to expose them to respirable crystalline silica:

- a. JHA with task specific hazards and controls; and

2.19 TEMPORARY TRAFFIC CONTROL

2.19.1 Provide temporary traffic control in compliance with the latest version of the *California Manual on Uniform Traffic Control Devices* (CA MUTCD).

2.19.2 Submit the following for LLNS approval:

- a. Maintenance of Traffic (MOT) Plan when work will affect the safety of motorist, bicycle, or pedestrian traffic.

2.20 WELDING, BURNING, OR FIRE PRODUCING ACTIVITIES

2.20.1 Perform welding in accordance with OSHA 29 CFR 1910 Subpart Q, *Welding, Cutting and Brazing* and ANSI Z49.1: *Safety in Welding, Cutting, and Allied Processes*, Sections 4.3 and E4.3 (2012). In addition:

- a. Thoriated tungsten electrodes are not allowed onsite.
- b. Coordinate with the STR to obtain a Hot Work Permit and implement required controls before beginning work for activities including cutting and welding, heat treating, grinding, powder-driven fasteners, hot riveting, torching, soldering, using tar pots/kettles, and any other heat producing or spark producing tasks that could result in a fire. The task specific JHA can reference the requirement to obtain a Hot Work Permit. The permit does not need to be obtained until before performing the hot work, but the JHA must state the requirement to obtain one.
- c. Post the approved Hot Work Permit at the work site until the work is completed.

2.20.2 Submit the following for LLNS approval if performing tasks with a fire hazard:

- a. JHA with task specific hazards and controls

2.21 RADIATION SAFETY

2.21.1 Conduct work with radioactive materials and/or radiation generating devices in accordance with 10 CFR 835 - Occupational Radiation Protection; and LLNL MAN-2050 - LLNL Radiological Control Manual; and applicable Health Physicist - Field Operation (HP-FO) procedures.

3. TRANSPORTATION AND PACKAGING

3.1 TRANSPORTATION MANAGEMENT

- 3.1.1 LLNS manages all aspects of hazardous and nonhazardous materials transportation on Site-200 and Site-300, including transportation between and within LLNS controlled sites, as well as the handling and packaging of hazardous materials at the same. Subcontractors are required to comply with all applicable local, State and Federal transport regulations per Department of Energy (DOE) DOE O 460.2 B, *Departmental Materials Transportation and Packaging Management* and DOE O 460.1D, *Hazardous Materials Packaging and Transportation Safety*.
- 3.1.2 All documents or records associated with these, or any other applicable local, State and Federal regulations must be made available upon request to LLNS for review.
- 3.1.3 Subcontractor must comply in audits or investigations by LLNS or external regulatory agencies confirming compliance with these regulations and/or following an incident.

3.2 MOTOR CARRIER OPERATIONS

- 3.2.1 Motor Carrier Operations must be performed in accordance with U.S. Department of Transportation (DOT) regulations 49 CFR 350-399 Subchapter B, *Federal Motor Carrier Safety Regulations*.
 - a. Must hold adequate licenses and certificates as required per 49 CFR 365, *Rules Governing Applications for Operating Authority* and 49 CFR 383, *Commercial Driver's License Standards; Requirements and Penalties* for all applicable Motor Carrier activities performed.
 - b. When applicable, must maintain an acceptable safety rating and record as a Motor Carrier per requirements set forth in 49 CFR 385, *Safety Fitness Procedures*.
 - c. Must meet financial responsibility requirements set forth in 49 CFR 387, *Minimum Levels of Financial Responsibility for Motor Carriers* which outlines insurance requirements for operating as Motor Carrier.
 - d. Personnel engaging in Motor Carrier Operations activities must be qualified and trained per requirements set forth in 49 CFR 391, *Qualifications of Drivers and Longer Combination Vehicle (LCV) Driver Instructors*. These requirements include, but are not limited to:
 - (1) Background and Character assessments
 - (2) Knowledge and Skill Tests
 - (3) Physical Qualifications and Examinations
 - (4) Qualification Files and Records
 - e. Vehicles, parts and accessories must remain in a serviceable condition and deemed acceptable for their intended use on LLNS property and on any public roadways between sites, per requirements set for in 49 CFR 393, *Parts and Accessories Necessary for Safe Operation* and 49 CFR 396, *Inspection, Repair, and Maintenance*. Vehicles, parts and accessories found to be unserviceable may be rejected from use by LLNS and are subject to inspection by LLNS. Subcontractor shall be responsible for resolving any compliance issues that may arise while on LLNS property, and/or responsible for reimbursement to LLNS, if required, to clean and mitigate any environmental non-compliances.
 - f. Driving Operations must be safely conducted in accordance with applicable local, State and Federal Safety guidelines. These include, but are not limited to, those outlined in 49 CFR 392,

Driving of Commercial Motor Vehicles, 49 CFR 397, Transportation of Hazardous Materials; Driving and Parking Rules and 49 CFR 399, Employee Safety and Health Standards.

- g. Procured Motor Carriers and Operators must be approved vendors, a list of which is managed by LLNS. New vendors must be vetted and approved by LLNS.

3.3 HAZARDOUS MATERIALS TRANSPORTATION

- 3.3.1 Hazardous Materials Transportation Operations must be performed in accordance with U.S. Department of Transportation (DOT) regulations 49 CFR 171-185 Subchapter C, *Hazardous Materials Regulations*.
- 3.3.2 All Hazardous Materials transported on and between LLNS controlled property must be properly identified, marked, labelled and declared per requirements set for in 49 CFR 172.1-172.606, *Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information*. Records associated with these requirements must be retained for the mandatory period, per these regulations.
- 3.3.3 Personnel who are identified as 'Hazmat Employees', participating in Hazardous Materials Transportation Functions, must be trained per requirements set forth in 49 CFR 172.700-172.704, *Training*.
- 3.3.4 Subcontractor must adhere to Shippers Requirements for classification and preparation of hazardous materials set forth in 49 CFR 173.1-173.477, *Shippers—General Requirements for Shipments and Packagings*.
- 3.3.5 Hazardous Materials Transportation Operations carried out by Public Highway must be conducted in accordance with 49 CFR 177.800-177.870, *Carriage by Public Highway*.

3.4 PACKAGING

- 3.4.1 Hazardous Materials Packagings selected for use must meet specifications outlined in 49 CFR 178, *Specifications for Packagings*.
- 3.4.2 Sourcing of Hazardous Materials Packagings to be provided by approved vendor from LLNS. STR to reach out to Packaging and Transportation Safety Functional Area (PTSFA) for support.
- 3.4.3 Packaging must be approved by LLNS prior to procurement. Subcontractor to submit request to STR. STR must review with PTSFA.
- 3.4.4 STR to coordinate with PTSFA to perform quality assurance receipt inspection.

4. ENVIRONMENTAL PROTECTION

4.1 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

4.1.1 All activities at the site must be previously reviewed and approved through the NEPA process prior to activity commencing.

4.2 POLLUTION PREVENTION

4.2.1 The Subcontractor shall incorporate pollution prevention into work planning and performance. In the event of any release of hazardous materials into the environment, the Subcontractor shall immediately notify the LLNS STR. In addition, the Subcontractor shall contain, repair, and clean up any such leaks or discharges into the environment and provide written reports of any such incidents as directed by the LLNS STR.

a. Storm Water Pollution Prevention

- (1) For any outdoor work in the areas covered by the California State Water Resources Control Board Industrial General Storm Water Permit (IGP) (2014-0057-DWQ), work must comply with the IGP as well as the Industrial Activities Storm Water Pollution Prevention Plans (SWPPPs). These areas include the Decontamination and Waste Treatment Facility (DWTF) as well as the B-612/625 complex at the Livermore site and B-883, B-845b and the Explosive Waste Storage Facility at Site 300. Copies of LLNS' Industrial Activities SWPPPs for the Livermore Site and Site 300 and the current IGP are available for Subcontractor review upon request. Include the following five paragraphs (2-6) for projects involving land disturbance of less than one acre in area, for example, landscaping projects with potential for ground disturbing work and storm water impact, and/or projects determined to be environmentally significant.
- (2) For projects with potential for stormwater impact, the Subcontractor shall maintain continual storm water pollution prevention and perform all work to ensure no pollutants are discharged into the storm drainage system. Failure to comply may result in LLNS halting work until the Subcontractor performs remedial actions. Refer to Appendix B for applicable Best Management Practices (BMPs).
- (3) The Subcontractor may substitute alternate pollution prevention measures for those identified in contract erosion control documents and Appendix B. Submit alternate measures for LLNS review. LLNS approval of alternate pollution prevention measures do not relieve the Subcontractor of responsibility for the quality and adequacy of the measures or Subcontractor implementation of them. Such acceptance does not warrant, acknowledge, or admit the quality and adequacy of the alternate pollution prevention measure.
- (4) Erosion control matting or similar materials may not include plastic monofilament.
- (5) Provide all materials and labor required to implement and maintain pollution prevention measures.

- (6) If pollution is leaving the project site, implement necessary corrective measures. Failure to comply with these requirements may result in criminal and civil liability of the Subcontractor under the Clean Water Act.
- (7) The following measures ensure that “non-construction” activities do not negatively impact storm water quality and receiving waters as required by the California Regional Water Quality Control Board, San Francisco Bay Region, Municipal Regional Storm Water NPDES Permit, R2-2022-0018 for the Livermore Site and the California Regional Water Quality Control Board, Central Valley Region, Order No. R5-2008-0148, Waste Discharge Requirements Issued to Lawrence Livermore National Security, LLC, and the US Department of Energy for Lawrence Livermore National Laboratory Experimental Test Site (Site 300) Sewage Evaporation and Percolation Ponds, Septic Systems, Cooling Tower Discharges, Mechanical Equipment Wastewater Discharges, and Other Low-Threat Discharges. (Note: The Industrial General Permit Storm Water Pollution Prevention Plans for the Livermore Site and Site 300 document storm water requirements for the Industrial General Permit regulated portions of LLNL).
 - i. Enclose painting operations, as appropriate, to be consistent with local air quality regulations and the Occupational Safety and Health Act (OSHA).
 - ii. Cover and properly store materials of particular concern (e.g., soil piles, chemical storage, paints) that are exposed to weather, especially during the rainy season.
 - iii. Properly store and dispose of waste materials generated from the activity. See Factsheet WM-5 in Stormwater Best Management Practice Handbook: Construction (CASQA).
 - iv. Provide spill response training for personnel who handle hazardous materials. Subcontractors must notify LLNS of any spills.
 - v. Maintain good housekeeping practices while work is underway and remove debris in a timely manner.
 - vi. Prevent discharges of non-permitted wastewater to the storm water drainage system.
 - vii. Washing and cleaning of vehicles and equipment shall be in the designated area and shall prevent pollutants from discharging into storm water. See Factsheet NS-08 in Stormwater Best Management Practice Handbook: Construction (CASQA).
 - viii. If vehicle fueling is necessary on-site, it shall be done in the designated location. Procedures and practices shall be designed to prevent fuel spills and leaks and reduce and eliminate contamination of stormwater. See Factsheet NS-09 in Stormwater Best Management Practice Handbook: Construction (CASQA).
 - ix. If vehicle maintenance is necessary on-site, vehicle and equipment maintenance shall be in a designated area and shall prevent pollutants from discharging into storm water. See Factsheet NS-10 in Stormwater Best Management Practice Handbook: Construction (CASQA).

- x. Contain and clean up waste generated by grinding, drilling, sanding, sandblasting, and scraping. Use a vacuum for fine particle clean-up. Dispose of waste properly.
- b. Materials and Waste Discharge
- (1) The Subcontractor shall not discharge hazardous materials or wastes onto LLNL property or the environment (i.e., air, soil, surface water, and groundwater). The Subcontractor shall protect all routes of entry to the environment, including direct discharges into air, soil, surface water, storm sewer, sanitary sewer, wells, and drainage channels, from work activities. This shall be achieved by the safe and proper use and storage of tools, equipment, and materials. Subcontractors shall inspect its equipment and vehicles daily for leaks of fuel, engine coolant, and hydraulic fluid. The Subcontractor shall contain, repair, and immediately report any leaks or accidental discharges into the environment to the LLNS STR.
 - (2) The Subcontractor shall not discharge any hazardous chemicals into the retention or sanitary system. All discharges to the sanitary sewer system must be approved by the LLNS STR.
- c. Discharges to Ground. The Subcontractor must prevent discharges to the ground by doing the following:
- (1) Notifying the LLNS STR of any unexpected subsurface conditions including unusual staining or other evidence of soil contamination.
 - (2) Collecting unused concrete in drums or lined containers (not to ground). The Subcontractor shall remove all excess concrete for proper disposal off-site and report the total quantity disposed of and/or recycled to the LLNS STR.
 - (3) Discharging wash water from cleaning concrete trucks and concrete handling equipment in drums or lined containers approved by the LLNS STR.
 - (4) Discharging wash or rinse water from pressure washing buildings as follows:
 - (a) The Subcontractor shall collect and manage any hazardous materials (e.g., lead-based paint chips) as hazardous waste.
 - (b) Any wash water containing soap must be collected and disposed of in the sanitary sewer. Contact the LLNS STR for approval.
 - (c) Wastewater resulting from washing hazardous residue or areas contaminated with hazardous materials must be collected, characterized, and disposed of properly.
 - (d) The Subcontractor shall discharge uncontaminated rinse water through a debris catch system.
 - (e) Wash or rinse water shall not be discharged into a storm drain, drainage channel, or other bodies of water.
 - (5) Complying with all Spill Prevention, Control, and Countermeasure (SPCC) requirements in 40 CFR 112 including, but not limited to:

- (a) Storing all oil and petroleum containers (e.g., diesel, gasoline, dielectric oil, mineral oil, motor oil, oil-based coolants, used oil, food oil, and oily wastewater) 55 gallons and larger in double-walled tanks/containers or in secondary containment sized to contain the largest container plus four inches of freeboard to accommodate for 24-hour 25-year storm if exposed to the elements.
- (b) Performing documented periodic inspections of all regulated bulk storage containers, portable bulk storage containers, electrical equipment and operating equipment that contain or can contain 55 gallons or more of oil.
- (c) Maintaining appropriate spill response materials (e.g., spill kits, written spill response and notification protocols); and material to prevent and contain leaks from equipment (e.g., drip pans).
- (d) Assuring oil container inspectors and oil handlers (personnel moving or filling oil containers) receive SPCC training either from LLNS or provide LLNS with documentation of equivalent training. An annual training refresher is required to be taken by oil handling personnel and must be provided either by LLNS or the Subcontractor. The Subcontractor will be required to ensure that all aspects of the SPCC training are implemented on the site. Copies of LLNS' site wide SPCC Plan for Site 200 or for Site 300 are available for Subcontractor review upon request.
- (e) Providing all required inspections to the LLNS STR at a regular frequency. Notify the LLNS STR immediately if a spill or leak has occurred.
- (f) Providing documentation of the material being stored and volume of oil for any oil-filled containers or equipment that contain or can contain 55 gallons or more of oil.
- (g) Notifying the LLNS STR if oil-filled containers or equipment that contain or can contain 55 gallons or more of oil will remain at the facility for 6 months or longer.

4.3 AIR QUALITY

4.3.1 Dust Control

- a. Perform dust control to alleviate and prevent dust nuisance at or near the work site as it pertains to the Subcontract work.
- b. "Dust nuisance" is airborne particulate matter in sufficient quantity to obscure an observer's view by more than 20% for more than 3 minutes in any 1 hour.
- c. Use the following methods of dust control when disturbing soil:
 - (1) Spray water on loose soil that may become airborne.
 - (2) Cover stockpiled excavated material containing soil to prevent wind and water erosion and dispersal during storage.
 - (3) Prevent dust suppression water from entering storm drains.

4.3.2 Equipment Emissions

- a. Internal Combustion Engines
- (1) Comply with applicable Bay Area Air Quality Management District (BAAQMD), San Joaquin Valley Air Pollution Control District (SJVAPCD), California Air Resources Board (CARB), and/or United States Environmental Protection Agency (EPA) rules and regulations for stationary and portable equipment (e.g., generators, air compressors, lifts). with an internal combustion engine's maximum brake horsepower rating (bhp):
 - (a) Greater than 50 bhp – stationary equipment.
 - (b) At 50 bhp and greater – portable equipment.
 - (2) For each portable equipment/engine subject to this section, within 30 days of the end of each calendar year and within 10 days of project close-out, provide the STR with the following records for each piece of portable equipment/engine (use Appendix D) in accordance with 17 CCR §93404-93405:
 - (a) Equipment type (e.g., generator, air compressor, lift).
 - (b) Equipment make and model.
 - (c) Internal combustion engine fuel type (e.g., diesel, gasoline, propane).
 - (d) Internal combustion engine make and model.
 - (e) Internal combustion engine maximum brake horsepower rating.
 - (f) Internal combustion engine Environmental Protection Agency (EPA) family identification number.
 - (g) Internal combustion engine air pollutant emission factors in grams per brake horsepower-hour (g/bhp-hr).
 - (h) Total number of hours equipment/engine operated at LLNL on a calendar year basis.
- b. Boilers and Water Heaters: Ensure boilers and water heaters used, procured, and/or installed comply with applicable BAAQMD, SJVAPCD, CARB, and/or EPA rules and regulations, including but not limited to:
- (1) BAAQMD Regulation 9-6 (Nitrogen Oxides Emissions from Natural Gas-Fired Boilers and Water Heaters) emission limits and certification requirements.
 - (2) BAAQMD Regulation 9-7 (Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters) emission limits, certification, stack gas temperature limits, insulation, and periodic testing requirements.
 - (3) SJVAPCD Rule 4306 (Boilers, Steam Generators, and Process Heaters – Phase 3), Rule 4307 (Boilers, Steam Generators, and Process Heaters – 2.0 MMBTU/HR to 5.0 MMBTU/HR), Rule 4308 (Boilers, Steam Generators, and Process Heaters – 0.075 MMBTU/HR to Less Than 2.0 MMBTU/HR), and Rule 4320 (Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater Than 5.0 MMBTU/HR).

- c. Other Equipment that emits air pollutants: Ensure air pollutant emitting equipment used, procured, and/or installed comply with applicable BAAQMD, SJVAPCD, CARB, and/or EPA rules and regulations.
- d. Ensure products, equipment, and work comply with BAAQMD or SJVAPCD regulations and the air permits issued for the Lawrence Livermore National Laboratory (LLNL) facility. Request a list of applicable air permits from the STR. Supply required information.
- e. Equipment containing refrigerants: Subcontractor shall perform all installation, maintenance, service, repair, or disposal of equipment containing refrigerants in accordance with 40 CFR 82 Subpart F and 17 CCR Sections 95380-95398 as applicable.
 - (1) Technician Certification. Subcontractor installing, maintaining, servicing, repairing, or disposing of equipment containing refrigerants, where the integrity of the refrigerant circuit could be violated, shall be certified in accordance with 40 CFR Part 82 Subpart F. Subcontractor repairing leaks to equipment subject to the 17 CCR Sections 95380-95398 requirements shall also hold a current and active California contractor's license in the C38 – Refrigeration Contractor licensing classification.
 - (2) Recovery and Recycling Equipment Certification. Equipment used for refrigerant recovery or recycling shall be certified in accordance with 40 CFR Part 82 Subpart F.
 - (3) Good Service Practices. Subcontractor shall adhere to the following:
 - (a) Intentional venting of refrigerants is prohibited.
 - (b) A leak inspection and leak repair shall be performed on equipment known to be leaking, prior to adding refrigerant.
 - (c) Refrigerants shall be evacuated to the required vacuum level specified in 40 CFR Part 82 Subpart F prior to opening equipment for repair.
 - (4) Leak Repair on Equipment with Full Charge Capacity of 50 or More Pounds of Refrigerant. If performing a leak repair, Subcontractor shall:
 - (a) Perform a complete leak inspection on the entire accessible portion of the equipment. Identify all leak locations.
 - (b) Evacuate refrigerant to the required vacuum level prior to opening equipment for repair. Record the refrigerant type, quantity and date refrigerant was recovered.
 - (c) Make repairs.
 - (d) Perform an initial verification test demonstrating the leak repair attempts were successful, before adding refrigerant back into the equipment.
 - (e) Add refrigerant into equipment. Record the refrigerant type, quantity and date refrigerant was added.
 - (f) Perform a follow-up verification test demonstrating the leak repair attempts were successful within 10 days of the successful initial verification test or 10 days of the appliance reaching normal operating conditions.

- (5) Disposing Equipment Containing Refrigerants. The subcontractor shall recover refrigerant from equipment to be disposed of with a full charge capacity of more than 5 pounds prior to sending the equipment to DUS or prior to removing equipment from the Site. The subcontractor shall not recover refrigerant from small appliances to be disposed of that are hermetically sealed with a full charge capacity of 5 or less pounds and if the equipment will be sent to DUS. Small appliances to be disposed of by the Subcontractor (taken with the Subcontractor and not sent to DUS) shall ensure that the Subcontractor or recycler/landfill operator will properly recover the refrigerant prior to final disposal. Check with STR to determine if recovered refrigerant is to be returned to LLNS for storage; or if it is to be transferred offsite to a refrigerant consolidator, a USEPA certified reclaimer, or a destruction facility. NOTE: Any refrigerant requiring disposal must be managed through LLNL's Radioactive & Hazardous Waste Management (RHWM) program. Refrigerant that will be reclaimed for reuse is not required to be managed through RHWM. However, subcontractors shall have a reasonable expectation that the refrigerant can be reclaimed for reuse before removing the refrigerant from the Site. The subcontractor must review the refrigerants and identify any that do not have a reasonable expectation of reclaim. Identified refrigerants must be managed through RHWM.
- (6) Records. The subcontractor shall provide the STR with the following records as applicable within 10 days of project closeout. Subcontractor shall prepare records associated with below items 3 - 5 using the Refrigerant Tracking Form – Service in Appendix C. Subcontractor shall prepare records associated with below item 6 using the Refrigerant Tracking Form – Disposal in Appendix C.
- (a) EPA certification cards of all technicians performing work handling refrigerants.
 - (b) Refrigerant recovery equipment certification, make, model and serial number.
 - (c) Maintenance, service, repair, and disposal records: location and identification of the refrigeration equipment; maintenance, service, repair, or disposal date; parts of the refrigeration equipment being maintained, serviced, repaired, or disposed; type of maintenance, service, repair, or disposal for each part; names of the persons performing the maintenance, service, repair or disposal; and the type and amount of refrigerant added to or removed from the equipment.
 - (d) Leak inspections records: inspection date, inspection methods, location of each identified leak, and a certification that all visible and accessible parts of the refrigeration equipment were inspected.
 - (e) Initial and follow-up verification test records: refrigeration equipment location and identification, test dates, locations of all repaired leaks that were tested, types of verification tests used and the results of the tests.
 - (f) Disposal Records: make, model, serial numbers of equipment, and date of disposal, certified technician's name and company, certification number (do not provide if contains Social Security Number) and certification type (I, II, III or Universal), refrigerant type, quantity recovered (lbs), and date recovered.

- (g) Refrigerant reclamation/destruction records, type and quantity of refrigerants transferred for reclamation/destruction and who it was transferred to and date of transfer. If reclaiming refrigerant, use a USEPA-certified reclaimer and provide proof of certification. If refrigerant will not be reclaimed, contact RHWM for management.
- f. Vehicles: Comply with all applicable CARB vehicle regulations such as, but not limited to: Large-Spark Ignition Engine Fleet Requirements Regulation (also known as the CARB LSI Regulation) in 13 CCR 2775-2775.2, Regulation for In-Use Off-Road Diesel-Fueled Fleets (also known as the CARB Off-Road Diesel Regulation) in 13 CCR 2449-2449.2, and Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants from In-Use Heavy-Duty Diesel-Fueled Vehicles (also known as the CARB Truck and Bus Regulation) in 13 CCR 2025. As part of compliance with the CARB vehicle regulations, LLNL notes that the subcontractor shall comply with the following:
 - (1) Required vehicle/equipment labeling.
 - (2) Follow LLNL Idling Policy.
 - (3) If subcontractor operates a vehicle(s) subject to any CARB fleet regulation on LLNL property, subcontractor must provide the STR with a copy of the associate compliance certificate or an affirmation of fleet wide compliance for the fleet dispatching vehicles issued by CARB or a written statement from the vehicle owner that verifies that their on-road heavy duty diesel vehicle fleet complies with all CARB vehicles regulations.
- g. Asbestos: Ensure that a 10-working day BAAQMD or SJVAPCD notification is submitted prior to the following:
 - (1) Demolition activities regardless of whether asbestos is present or not.
 - (2) Renovation activities involving the stripping or disturbance of regulated asbestos containing material (RACM) equal to or greater than:
 - (a) Livermore Site (BAAQMD): 100 linear feet, 100 square feet, or 35 cubic feet.
 - (b) Site 300 (SJVAPCD): 260 linear feet, 160 square feet, or 35 cubic feet.

4.3.3 Hydrofluorocarbons (HFCs)

- a. New, Modified, or Retrofitted Equipment or Products Containing or Manufactured with Hydrofluorocarbons (HFCs). Subcontractor shall ensure that new, modified, or retrofitted equipment or products containing or manufactured with HFCs, purchased, installed, or used, comply with:
 - (1) CARB Prohibition on Use of Certain Hydrofluorocarbons in Stationary Refrigeration, Stationary Air-conditioning, and Other End-Uses (California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4, Sub Article 5).
 - (2) USEPA Significant New Alternatives Policy (Clean Air Act, Section 612).
 - (3) USEPA Restrictions on the Use of Hydrofluorocarbons (40 CFR 84.54).

- b. New, modified, or retrofitted equipment and products subject to these regulations include stationary air conditioning equipment, chillers, industrial process refrigeration, cold storage warehouses, retail food refrigeration (e. g., cafeteria equipment), refrigerators, freezers, vending machines, foams (e.g., insulation used in roofing, walls, flooring, pipes, vessels, appliances, and refrigeration equipment; furniture cushions; food service packaging and containers), spray foams, aerosols, and propellants.

4.4 WASTE MANAGEMENT

- 4.4.1 Unless otherwise stated in the Subcontract, the Subcontractor shall be responsible for notifying LLNS of all waste generated from hazardous materials used in the performance of the Subcontract. LLNS will manage all hazardous, radioactive, and mixed waste to ensure waste is stored, handled, and disposed of in accordance with applicable federal, state, local environmental regulations, and any approved ES&H Submittals. The Subcontractor shall minimize waste through effective waste management and management of hazardous and non-hazardous materials used during planning and performance of the work.
- 4.4.2 Hazardous waste generated at LLNL must be managed as hazardous waste by LLNS. This includes universal wastes such as electronics, batteries, and fluorescent light tubes, as well as paints, solvents, oils, and greases.
- 4.4.3 Municipal Waste: The Subcontractor shall only dispose of waste items into the municipal waste cans or dumpsters that meet LLNS approved waste profile which includes paper products, food waste, foam, plastic, rubber, etc. The Subcontractor is encouraged to utilize established paper, cardboard, compost/organics, and commingled recycling bins to reduce the amount of municipal waste generated.
- 4.4.4 Waste Tires: Transportation of 10 tires or more: Hauling Contractor must be a registered waste tire hauler or exempt under Public Resources Code 42954 and must use the Comprehensive Trip Log/Manifest form. Transportation of less than 10 tires: Document removal by including no less than the required elements identified in California Code of Regulations 18462(d)(1) (e.g., bill of ladings, daily log entries, types of tires, dates of removal). Documentation must be provided to LLNS STR.
- 4.4.5 If materials are being sent to an off-site disposal facility, the Subcontractor shall work with LLNS for approval and shall report all quantities and types of waste disposed of to the LLNS STR.
- 4.4.6 Managing Soil and Debris: Soil and debris must be characterized and evaluated for potential hazardous and/or radioactive contamination prior to reuse on-site or disposal off-site. Characterization is required for every new project by using existing soil analytical data from previous projects or by collecting and analyzing new, representative soil and/or debris samples. This process is triggered through the dig permit process.
- 4.4.7 Recyclable Material: The Subcontractor shall encourage the collection and recycling of other municipal waste, e.g., glass, plastic and metal drink bottles, packaging material, compostable material (trees, wood, etc.), generated by the work. Scrap metal should be solely managed by DUS, unless otherwise allowed by the LLNL STR after discussion with DUS. All quantities and types of materials recycled must be tracked and reported to the LLNS STR.

4.5 USE AND MANAGEMENT OF NONHAZARDOUS AND HAZARDOUS MATERIALS

- 4.5.1 LLNS has implemented a program to reduce or eliminate the use and release of certain toxic and hazardous chemicals and materials. The Subcontractor shall, to the maximum extent possible without conflicting with the technical requirements of the Subcontract, reduce or eliminate the use and release of certain toxic and hazardous chemicals and materials by:
- a. Use cleaning products that comply with either EPA's Safer Choice or Green Seal GS-37 standards. If Safter Choice or GS-37 products are not available, use products that comply with the California Air Resources Board Consumer Products Regulation (California Code of Regulations Title 17, Article 2, Sections 94507-94517.
 - (1) Using environmentally benign solvents and solvent-free alternative systems that reduce or eliminate the use of hazardous substances and/or the generation of hazardous waste, and use of non-ozone depleting substances.
 - (2) Purchase materials in container sizes and amounts that minimize the amount of excess material generated by the project.
 - (3) Reusing and/or recycling surplus commodities and by-products.
 - b. Make maximum use of recycled content products (epa.gov/cpg) and biobased products (e.g., cleaning supplies, sealants, and coatings) that are United States Department of Agriculture (USDA)-designated items (www.biopreferred.gov) unless the product cannot be acquired as follows:
 - (1) Competitively within a period providing for compliance with the contract performance schedule.
 - (2) Meeting contract performance requirements; or
 - (3) At a reasonable price.
 - c. Tracking and Reporting of Certain Types of Hazardous Materials: The use of certain hazardous materials must be tracked and reported to state and federal agencies. Discuss with the LLNS STR the types of hazardous materials to be used in work activities to determine if any materials must be tracked. The Subcontractor shall maintain all tracking documents identified by LLNS and provide the documents to the LLNS STR and to the ChemTrack Office (ctweb@llnl.gov) when the work activity is completed.
 - d. Purchase of hazardous materials in container sizes and amounts that minimize the amount of excess material generated by the work.
 - e. Safety Data Sheets (SDS): The Subcontractor shall submit SDSs to the LLNS STR and ChemTrack Office (ctweb@llnl.gov) for all hazardous materials (e.g., chemicals, oils, solvents, paints, epoxies, adhesives, petrochemical, or similar materials) to be used at the work location. The Subcontractor shall store materials in containers in accordance with the requirements of the SDS within the work area boundary or as directed by the LLNS STR. The Subcontractor shall notify LLNS of all such materials not incorporated in the work so they can be managed and disposed of in accordance with the applicable federal, state, and local regulations.

- f. Hazardous Materials Inventory: The Subcontractor shall also complete and submit to the LLNS STR and the ChemTrack Office (ctweb@llnl.gov), the LLNL Hazardous Material Inventory form (form to be provided by the LLNS STR). Copies of the completed forms shall be retained, by the Subcontractor, with the SDSs for the work. If any hazardous materials are to remain on-site at the end of the work, the Subcontractor must advise the LLNS STR and contact the ChemTrack Office (ctweb@llnl.gov).
- g. Transportation of Hazardous Materials: The Subcontractor shall comply with applicable federal and state regulations when transporting hazardous materials to and from LLNL sites. In addition, the Subcontractor shall comply with all posted traffic signs, speed limits, and follow applicable California Vehicle Code requirements while driving on the LLNL sites.

4.6 RESOURCE CONSERVATION

4.6.1 Conservation of Energy and Water

- a. To the maximum extent practicable, the Subcontractor shall implement conservation practices that will reduce the consumption of water and electricity. Reduction practices may include:
 - (1) Turning off electrical-powered items (e.g., tools, office equipment, lights) when not in use.
 - (2) Use energy efficient products (i.e., Energy Star products or FEMP-designated products) unless the energy-consuming product is not listed in the Energy Star program or FEMP.
 - (3) Turning off water source when not in use.
 - (4) Using water efficient products in work activities, where feasible.
- b. Protection of Cultural or Paleontological Resources
 - (1) The Subcontractor shall immediately report any evidence of unidentified cultural or paleontological resources unearthed during excavation to the LLNS STR. Subcontractor shall stop all work within 50 feet of the find until it has been assessed by LLNS and a notice to proceed is issued by the LLNS STR. LLNS will mark known cultural or paleontological resource areas by staking, fencing, and pink/black diagonally striped flagging. The Subcontractor shall avoid these areas while performing the work. Examples of cultural resources include:
 - (a) Prehistoric cultural deposits such as obsidian or chert flakes or tools; ground-stone mortars, slabs, or pestles; cultural deposits of shell or bone; beads, clothing, or woven articles; locally darkened midden (trash) soils; and human interments.
 - (b) Historic-period cultural materials such as foundations or other structural remains; bottles, nails, barbed wire, ceramic pieces, buttons, weathered boards, and tin cans; refuse deposits; backfilled wells or privies; nails; glass and pottery.
 - (c) Examples of paleontological resources include fossils and bones that are not of human origin.
 - (2) The Archaeological Resources Protection Act (ARPA) and the Antiquities Act regulate the protection and excavation of cultural or paleontological resources. The Subcontractor shall,

under no circumstances, remove or disturb any such cultural or paleontological resources. If discovered, the Subcontractor shall leave in place, note their location, and immediately notify the LLNS STR.

c. Protection of Biological Resources

- (1) Species listed as endangered, threatened, or proposed or candidates for listing under the federal Endangered Species Act (ESA) and/or California Endangered Species Act (CESA) occur at Site 300, the Livermore Site, and the Arroyo Mocho Site. Several other species occur at these LLNL sites that may receive protection under other federal and state regulations including the Migratory Bird Treaty Act (MBTA). Numerous federal and state laws outline the protection, management requirements, and penalties for noncompliance. Site-specific and project-specific requirements may apply that include, but are not limited to, pre-activity surveys, exclusion zones, and exclusion fencing. See the Project Requirements Document (PRD) for project specific avoidance and minimization measures required by Biological Opinions with the U.S. Fish and Wildlife Service. Contact the LLNS STR for a determination.
- (2) All personnel conducting outdoor work at Site 300, the Livermore Site or the Arroyo Mocho Pumping Station must be current in EP0030 (LLNL Natural Resources Compliance and Safety). EP0026 (Livermore Site Natural Resources Compliance and Safety) may be substituted for EP0030 for individuals who will only work at the Livermore Site. If an LLNL natural resources training is required, then LLNS requires laborers, craftsmen, supervisors, and managers directly involved in the project to attend the above training.
- (3) Do not attempt to capture, relocate, or handle any wild or feral animal or remove any nests. If wild or feral animals or nests are found in the work area, immediately cease work in that area and contact the LLNS STR.
- (4) Do not feed or provide water for wild or feral animals at LLNL sites.
- (5) Do not bring or release animals to LLNL sites.
- (6) All staging, laydown and soil storage areas must be in previously disturbed areas approved by the LLNS wildlife biologist unless otherwise specified by LLNS STR.
- (7) Keep the project site clean and free of trash. Deposit food scraps, paper and aluminum wrappers, packaging, cans, bottles, and other food related and trash items in covered and closed trash containers that are not accessible by wildlife. Empty food trash bins at the end of each workday.
- (8) Open Excavations (outside or exterior of the building): Protect wildlife from entrapment in steep-walled excavations greater than 1 foot deep as follows:
 - (a) Cover excavations completely at the end of each working day. Completely bury the edges of the cover (steel plate or plywood) to prevent wildlife access under the cover, or
 - (b) Provide excavations with animal escape ramps constructed of earth fill or wooden planks (at least 6 inches wide). Earth ramps should be used whenever possible. Wooden planks or earthen ramps should be at a 1:1 slope.

- (c) Before filling excavations, thoroughly inspect them for trapped animals. Contact the LLNS STR to obtain the assistance of a LLNS wildlife biologist to free trapped animals.
 - (d) Backfill excavation as soon as possible and prior to the end of the project unless directed by LLNS.
- (9) Avoid impacts to nesting birds as described below:
- (a) The LLNS wildlife biologist will be contacted by the LLNS STR and given sufficient time to survey the affected area prior to initiation of project activities.
 - (b) Projects that have the potential to impact nesting birds include but are not limited to the following:
 - i. Work on building exteriors.
 - ii. Tree trimming or removal.
 - iii. Power washing building exteriors or window washing.
 - iv. HVAC work, roof replacement, or other exterior retrofit projects.
 - v. Work within or around arroyos, drainage ditches, waterways, or other protected water features.
 - (c) If nesting birds are found at the project site, exclusion zones and site-specific avoidance measures may be required.
 - (d) If a nest is found in or near the work area, pause work, avoid the area, and contact the LLNS STR.
 - (e) Do not attempt to move or disturb any nest.
 - (f) Impacts to nesting birds, and project delays due to nesting birds, can typically be avoided by scheduling the activities after August 30 and before February 15 of any given year.
- (10) Implement appropriate erosion control measures as identified by LLNS, such as native seeding and burlap straw waddles, jute netting, or SiltSoxx. Do not use materials containing plastic monofilament, nylon net, plastic net, or photodegradable netting at LLNL sites. Certain tightly woven (without gaps) plastic materials are allowed if approved by the LLNS wildlife biologist. Silt fencing may not be used at Site 300 unless approved by the LLNS wildlife biologist. Contact the STR for assistance with these exceptions.
- (11) Do not violate the exclusion zones or other areas demarcated by LLNS. Exclusion zones may be shown on a map or marked in the field with pink and black flagging or exclusion tape.
- (12) All pipes, culverts, or similar structures (greater than 6-inches in diameter) that are stored in the project area for one or more overnight periods shall be securely capped prior to storage or thoroughly inspected for animals if the pipe is subsequently buried, capped, or otherwise used or moved in any way.

- (13) Exterior work at Site 300 involving construction, demolition, or ground disturbance shall be restricted to periods of low rainfall (less than 0.25-inch forecast during a 24-hour period and less than a 30 percent chance of rain forecast using the weather.gov forecast for the project site).
- (14) Exterior work at Site 300 involving construction, demolition, or ground disturbance shall occur only during daylight hours as defined as after sunrise and before sunset.
- (15) Wildlife Exclusionary Fencing:
- (a) Install exclusionary fencing, if required by LLNS, to surround the project site prior to the start of work to preclude movement of wildlife into the project site.
 - (b) When required, exclusion fencing must be installed prior to grading, excavation, soil disturbance, or materials staging associated with this project.
 - (c) Exclusion fencing must surround work areas. Include a gate that can be closed at the end of each workday, so that the project site is surrounded by exclusion fencing overnight.
 - (d) The exclusion fencing must remain in place during outside work.
 - (e) Use Ertec E-Fence, or equivalent, that is a minimum of 18 inches in height for the exclusion fencing.
 - (f) Hold the exclusion fence in place by trenching at least 5 inches into the ground and backfilling and compacting soil on both sides of the fence. When trenching is not appropriate, hold the base of the fence down with sandbags, or other appropriate methods according to the manufacturer's specifications, in a manner that eliminates gaps.
 - (g) When exclusion fencing spanning more than 50 linear feet is used, install one-way exit funnels at the base of the exclusion fence every 25 feet per manufacturer's specifications.
 - (h) Follow the manufacturer's specifications when installing and maintaining the exclusionary fencing.
 - (i) Inspection by the LLNS wildlife biologist after exclusion fence installation is required. Contact the LLNS STR to request an inspection by the LLNS wildlife biologist.
 - (j) Maintain exclusionary fencing throughout the duration of the project.
 - (k) Perform weekly inspections of the exclusionary fencing associated with the project.
 - (l) Repair holes, tears, gaps, or downed fence observed during the inspection as soon as possible.
 - (m) Document the weekly inspections, and repairs that are performed.
 - (n) Maintain records of the inspections onsite and make them available to LLNS upon request.

APPENDIX A

CRANES, HOISTS AND RIGGING

Regulations

- A. Conduct hoisting and rigging activities in accordance with 29 CFR 1910 Subpart N, *Materials Handling and Storage*. Plan and execute lifts of personnel, such as using a hoisting device or basket, in accordance with ASME B30.23.

Applicability

- B. Hoisting and rigging activities include use of the following equipment or devices:
- Mobile cranes
 - Facility cranes
 - Forklifts with lifting attachments
 - Chain falls
 - Come-a-longs
 - Gantries
 - Industrial grade and/or rated: Jacks, Rollers, Dollies, Skates/skids, SPMT's (Self Propelled Modular Transporters), Pushers/pullers)
 - Rigging equipment, such as slings, rigging hardware, below-the-hook lifting devices, etc.

LLNS Specific Requirements

In addition, the following LLNS requirements apply to Subcontractors performing hoisting and rigging activities at LLNL.

- C. Personnel Training and Qualification. Provide personnel who rig loads, provide crane signal duties, and/or operate cranes or hoists that have experience and training on selection, inspection, hazards, operation, and use of hoisting and rigging equipment. Personnel must also have the following qualifications:
- Be 18 years of age or older.
 - Operator certification by the National Commission for Certification of Crane Operators (NCCCO) or other organization recognized by the U.S. Department of Labor.
 - Rigger/Signalman certification by the National Commission for Certification of Crane Operators (NCCCO) or other organization recognized by the U.S. Department of Labor.
- D. Equipment Inspection and Maintenance. Tag rigging equipment with capacity. Provide documentation upon request demonstrating that the equipment passed an annual inspection within 1 year from date of intended use and passed a preoperational inspection prior to use. Store rigging

properly (e.g., on racks or in protected areas). Inspect rigging in compliance with 29 CFR 1926.1400. Maintain inspection records at the project site.

- E. LLNS will classify lifts **during the site inspection** into one of the following categories: **Ordinary, Special-Ordinary, or Critical**. Provide input during the site inspection to LLNS as appropriate to determine the lift categories.

Ordinary lift. Lifts that are not categorized as Special-Ordinary or Critical are Ordinary lifts.

Special -Ordinary lift. Lifts where any of the following conditions are present:

- The load will be rotated or manipulated on or about its non-vertical axis.
- The load will be transferred (i.e., in mid-air from one crane to another).
- Any load where the center of gravity might move during the lift, such as a tank filled with liquid.
- Use of multiple lifting devices, such as use of more than one lifting equipment (i.e., cranes, hoists, forklifts, jacks) in sharing the load.
- LLNS management may choose to classify a lift as Special-Ordinary for reasons other than those noted above.

Critical lift. Lifts where any of the following conditions are met:

- Loss of control of the load being lifted would result in the declaration of an emergency.
- The load is unique and vital to a system, facility, or project operation, and would be irreplaceable or not repairable if damaged.
- If the load is damaged, the cost to replace or repair the load, or the delay in operations would have a negative impact on facility, organizational, or DOE budgets that would affect program commitments.
- If mishandling or dropping of the load would cause any of the above consequences to nearby installations and facilities.
- For steel erection, the lift exceeds 75 percent of the rated capacity of the crane or derrick or requires the use of more than one mobile crane or derrick (refer to 29 CFR 1926.751).

- F. Lift Plan Requirements

Submit lift plans for lifts (except Ordinary lifts that are less than 2000-lbs). The Subcontractor may include multiple lifts at a location in a single lift plan.

Address the following in the lift plans:

- Designate personnel roles, as shown in the table below.
- Break the lifting activities down to the task level (staging, rigging, pre-lift, lift, and securement), using drawings and/or text.
- Characterize the load: weight, dimensions, center of gravity, rigidity, stability, and rigging attachment points. Verify undocumented attachment points by calculation to demonstrate adequacy.
- Define the work area:

- Boundaries and access control
- Travel path of the load
- Start, staging, and finish points
- Equipment, facilities, or structures that pose obstructions or impediments to moving/manipulating the load
- Imposed loads on structures, utilities (above/below grade)
- Weather considerations
- Identify the lifting and rigging equipment: type (use the categories in Section B), capacities (load charts), physical size (length, width, height, physical compatibility), and rigging equipment (slings, rigging hardware, below-the-hook lifting devices).
- Describe securement of the load.
- Provide load path calculations (identify the forces that are affecting the rigging equipment).
- Provide mathematical calculations to demonstrate the load/object moves only due to forces and moments appropriately applied to start and stop desired motion.
- Demonstrate that equipment and components are within design constraints, and peripheral issues (ground bearing issues, crane mat calculations, and prohibited zones for power lines) are properly addressed.

Requirements and documentation for the different categories of lifts are shown in the table below:

Requirement	Lift Type			
	Ordinary < 2000-lbs	Ordinary > 2000-lbs	Special-Ordinary	Critical
Documented Lift Plan	Not required	Required	Required	Required
Designation of Personnel Roles	Name a Designated Leader (DL) that is approved by the STR in the lift plan. Keep the lift plan at the work site for the duration of lifting operations. Obtain STR approval to change the DL or modify the lift plan.	Name a Designated Leader (DL) that is approved by the STR in the lift plan. Keep the lift plan at the work site for the duration of lifting operations. Obtain STR approval to change the DL or modify the lift plan.	Name a Designated Leader (DL) that is approved by the STR in the lift plan. Keep the lift plan at the work site for the duration of lifting operations. Obtain STR approval to change the DL or modify the lift plan.	Appoint a Person In Charge (PIC); LLNS concurrence. Designate in lift plan, present at work site for entire lifting operation, and cannot be delegated or transferred.

Requirement	Lift Type			
	Ordinary < 2000-lbs	Ordinary > 2000- lbs	Special-Ordinary	Critical
Inspections / Verifications	Hoisting and rigging equipment meets ASME B30 requirements. Provide copies of personnel and equipment certifications and equipment inspection records to the STR for approval. Equipment certifications and inspection records must match the lift plan. The STR will provide approval to execute the lift plan after a LLNS qualified person verifies the initial setup of and any subsequent repositioning of equipment.	Hoisting and rigging equipment meets ASME B30 requirements. Provide copies of personnel and equipment certifications and equipment inspection records to the STR for approval. Equipment certifications and inspection records must match the lift plan. The STR will provide approval to execute the lift plan after a LLNS certified person verifies the initial setup of and any subsequent repositioning of equipment.	Hoisting and rigging equipment meets ASME B30 requirements. Provide copies of personnel and equipment certifications and equipment inspection records to the STR for approval. Equipment certifications and inspection records must match the lift plan. The STR will provide approval to execute the lift plan after a LLNS certified person verifies the initial setup of and any subsequent repositioning of equipment.	Proof load test rigging equipment (slings, below-the-hook lifting devices, and rigging hardware) in accordance with applicable ASME standard. LLNS certified personnel verification and approval of equipment upon arrival at LLNL. Request that the LLNS STR arrange verification of set up and equipment prior to each set of lifts following repositioning.
Drawings			Scaled drawings required	Scaled drawings required
Documented Pre-Lift Meeting			Required	Required. Document in the lift plan.
Practice Lift				Required as specified by LLNS
Documented Post-Lift De-Brief		Required	Required	Required

Required Submittals

G. Submit the following information/documents to LLNS:

- Completed Lift Plan (may utilize template provided by LLNS)
 - Submit the lift plan(s) to LLNS for review and approval at least 10 business days prior to the commencement of the specific lift.
 - Include scaled drawings for complex and critical lifts.

Note: Present deviations from an approved lift plan to the LLNS STR for approval prior to proceeding.

- Certification/Qualification documents for Crane Operators, Riggers, and Signal Persons
 - Provide personnel qualifications with lift plan prior to the beginning of the work activity or upon arrival of the personnel at LLNL for approval by the LLNS STR.
- Age verification (i.e., employees are over 18 years of age) for all employees involved with cranes, hoisting and rigging.
- Current crane certifications and inspection information.
- ASME certifications and inspection records for the equipment used for hoisting and rigging.
- ASME proof load test documentation for slings, below-the-hook lifting devices and rigging hardware used for critical lifts.

(END OF APPENDIX A)

APPENDIX B

LLNL STORM WATER BEST MANAGEMENT PRACTICES FOR OUTDOOR ACTIVITIES

Purpose

The requirements in this document are to ensure that LLNL non-industrial facilities and activities do not negatively affect storm water and receiving water quality as required by the California Regional Water Quality Control Board, San Francisco Bay Region, Municipal Regional Storm Water NPDES Permit, R2-2022-0018 for the Livermore Site and the California Regional Water Quality Control Board, Central Valley Region, Order No. R5-2008-0148, Waste Discharge Requirements Issued to Lawrence Livermore National Security, LLC, and the U.S. Department of Energy for Lawrence Livermore National Laboratory Experimental Test Site (Site 300) Sewage Evaporation and Percolation Ponds, Septic Systems, Cooling Tower Discharges, Mechanical Equipment Wastewater Discharges, and Other Low-Threat Discharges. The Storm Water Pollution Prevention Plans (SWPPP) for the Livermore Site and Site 300 document storm water requirements for the portions of LLNL are regulated by the *Industrial General Permit*.

Scope

These BMPs outline coverage for the non-industrial portions of LLNL sites; more specifically outdoor activities where ground disturbance is less than one acre.

The effort is to prevent or reduce the discharge of pollutants to storm water from outdoor activities. LLNS achieves this by using sediment and erosion controls, enclosing, or covering material storage areas, using good housekeeping practices, using nonhazardous or less hazardous alternative products, and training employees. It is the responsibility of the Subcontractor to follow this approach for outdoor work areas and activity, including laydown and storage areas.

Most of the BMPs discussed in this chapter are temporary measures specific to construction and ground-disturbing activities but should be implemented for all outdoor work. Subcontractors performing work on-site are responsible for implementing BMPs. Where applicable, use BMPs identified in the most recent *Storm Water Best Management Practice Handbook: Construction (CASQA)*.

Requirements

These BMPs include, but are not limited to the following:

- Use sediment control techniques when bare soil is temporarily exposed. See SE factsheet series in *Storm Water Best Management Practice Handbook: Construction (CASQA)*.
- Use soil erosion control techniques, when practical, where bare ground is temporarily exposed. See EC factsheet series in *Storm Water Best Management Practice Handbook: Construction (CASQA)*. LLNS prohibits the use of erosion control rolls, mats, or other similar materials containing monofilament, thin plastic thread or plastic netting at the project site.
- Use permanent soil erosion control techniques in areas where buildings are removed and not replaced (e.g., landscaping, hydro-seeding, mulching, or graveling).

- Enclose painting operations, as appropriate, to be consistent with local air quality regulations and the *Occupational Safety and Health Administration* (OSHA).
- Cover and properly store materials of particular concern (e.g., soil piles, chemical storage, paints) exposed to weather, especially during the rainy season. Limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are necessary, consider the use of plastic materials resistant to solar degradation.
- Properly store and dispose of waste materials generated from the activity. See Factsheet WM-5 in *Storm Water Best Management Practice Handbook: Construction* (CASQA).
- Provide spill response training for personnel who handle hazardous materials.
- Maintain good housekeeping practices while work is underway and remove debris in a timely manner.
- Prevent discharges of non-permitted wastewater to the storm water drainage system.
- Protect nearby storm drains to minimize the chance of inadvertent discharge of project-related materials or sediment. See Factsheet SE-10 in *Storm Water Best Management Practice Handbook: Construction* (CASQA).
- Designate an appropriate concrete washout area for trucks. See Factsheet WM-8 in *Storm Water Best Management Practice Handbook: Construction* (CASQA).
- Clean any sediment or debris from the storm water drainage system in the immediate vicinity of the outdoor activities after those activities are completed.
- Filter or settle sediment-laden runoff prior to discharge (avoid use of straw bales).
- Provide effective stabilization for disturbed soil and other erodible areas prior to a forecasted storm.
- Maintain effective perimeter controls, stabilize site entrances, and exits to sufficiently control discharging or tracking of erodible materials off the site. If track out occurs, street sweep, as necessary. See Factsheet TC-2 in *Storm Water Best Management Practice Handbook: Construction* (CASQA).
- Divert run-on and storm water generated offsite away from disturbed areas on-site.
- Implement effective wind erosion controls, and BMPs to control aerial deposition of site materials.
- Wash and clean vehicles and equipment in designated area and prevent pollutants from discharging into storm water. See Factsheet NS-08 in *Storm Water Best Management Practice Handbook: Construction* (CASQA).
- If re-fueling is necessary on-site, fuel vehicles in designated location. Design procedures and practices to prevent fuel spills and leaks and reduce and eliminate contamination of storm water. See Factsheet NS-09 in *Storm Water Best Management Practice Handbook: Construction* (CASQA).
- If vehicle maintenance is necessary on-site, perform vehicle and equipment maintenance in a designated area and prevent pollutants from discharging into storm water. See Factsheet NS-10 in *Storm Water Best Management Practice Handbook: Construction* (CASQA).
- Contain and clean up waste generated by grinding, drilling, sanding, sandblasting, and scraping. Use a vacuum for fine particle clean-up. Dispose of waste properly.

(END OF APPENDIX B)

**APPENDIX C
REFRIGERANT TRACKING FORMS**

Refrigerant Tracking Form - Service (Rev. 9/7/2022)

Work order # _____		Building: _____	
Date Issued: _____	Completed: _____	Unit ID: _____	Circuit #: _____
Team: _____		Specific Location _____	
Mechanic: _____	Emp No: _____	Manufacture: _____	M/N: _____
Supervisor: _____		S/N: _____	Refrigerant type: _____
Reason for Dispatch			
Service Description	Date		
Preventative Maintenance	_____	Decommission	Refrigerant Transfer _____
Corrective Maintenance	_____	Mothballed	Disposal _____
Service Description notes:			
Recovery Unit	Model	Serial Number	
Refrigerant	Cylinder ID	Type	Condition
Recovered	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Unit flat at "0" psi could not recover		Total Recovered: _____	
Refrigerant	Cylinder ID	Type	Condition
Added	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Start up Charge		Total Added: _____	
Leaks		Leak Notes:	
Leak Inspection ¹	Date ¹ : _____		
Method: _____			
Leak Found	Date: _____		
Leak repaired	Date: _____		
Initial Verification test	Date: _____		
Method: _____			
Follow-up Verification Test	Date: _____		
Method: _____			
		Trace Gas Used	_____
		Refrigerant Type:	_____
		Cylinder ID:	_____
		Quantity:	_____

¹ By providing the leak inspection date the technician certifies that all visible and accessible parts of the appliance were inspected

Instructions When Servicing, Maintaining or Repairing Equipment

1. Complete top box (e. g., WO#, Dates, Name, Emp No., Bldg, Unit ID, Refrigerant Circuit #, Make, M/N, S/N, Refrigerant type).

2. In "Reason for Dispatch" section, describe why dispatched (PM, System down, Hot Call, etc.)
3. In "Service Description" section, check the appropriate type.
4. In "Service Description notes:" section briefly describe what you found upon arrival at the unit:
 - a. Major Maintenance = Recovery Required (If recovery stopped, state reason)
 - b. Non-Major Maintenance = Repairs without Recovery (tighten packing or flare fitting)
 - c. Part(s) of the appliance being repaired, maintained, or serviced.
5. In the "Recovery Unit" section enter the refrigerant recovery equipment model number and serial number.
6. In the "Refrigerant Recovered" section enter the recovery cylinder ID, refrigerant type (e. g., R-410A), refrigerant condition (usable, not usable), quantity recovered (lbs) and date of recovery.
7. Enter Total Recovered (lbs)
8. In the "Refrigerant Added" section enter the cylinder/drum ID, refrigerant type (e. g., R-410A), refrigerant condition (new, recovered), quantities (lbs) and date added.
9. Enter Total Added (lbs). This is the "net" amount of new refrigerant added.
10. Complete Hard Issue Form and submit it to B512 within 1 business day of adding refrigerant.

Leak Repair Requirements

1. Leak inspections shall include all visible and accessible parts of the appliance. Enter leak inspection method and date.
2. If leaks are found enter the date. In "Leak Notes:" section list the leak locations and a description of each leak.
3. Enter the date the leak was repaired.
4. Enter the Initial Verification Test method and date. Test must be performed prior to adding refrigerant back into the system. In "Leak Notes:" section list the location(s) of all repaired leaks that were tested.
5. Enter the Follow-up Verification Test method and date. Test must be performed within 10 days of the successful initial verification test or 10 days of the appliance reaching normal operating conditions.
6. If a tracer gas was used enter the type and quantity.

Leak inspection determines the location of refrigerant leaks.

- Valid leak inspection methods include ultrasonic tests, gas-imaging cameras, bubble tests as appropriate, or the use of a leak detection device operated and maintained according to manufacturer guidelines.
- Methods that determine whether the appliance is leaking refrigerant but not the location of a leak, such as standing pressure/vacuum decay tests, sight glass checks, viewing receiver levels, pressure checks, and charging charts, must be used in conjunction with methods that can determine the location of a leak.

Valid initial or follow-up verification test methods include soap bubbles as appropriate, electronic, or ultrasonic leak detectors, pressure or vacuum tests, fluorescent dye, and black light, infrared or near infrared tests, and handheld gas detection devices.

Refrigerant Tracking Form - Disposal (Rev. 9/7/2022)

Work order # _____		Building: _____	
Date Issued: _____	Completed: _____	Unit ID: _____	Circuit #: _____
Team: _____		Specific Location: _____	
Mechanic: _____	Emp No: _____	Manufacture: _____	M/N: _____
Supervisor: _____		S/N: _____	Refrigerant type: _____
Reason for Dispatch			
Service Description			
Preventative Maintenance	Date	Decommission	Refrigerant Transfer
Corrective Maintenance		Mothballed	Disposal
Service Description notes:			
Recovery Unit			
Model	Serial Number		
Refrigerant	Cylinder ID	Type	Condition
Recovered			Quantity (lbs)
			Date
Unit flat at "0" psi could not recover		Total Recovered:	

Instructions When Disposing Equipment

1. Complete top box (e. g., WO#, Dates, Name, Emp No., Bldg, Unit ID, Refrigerant Circuit #, Make, M/N, S/N, Refrigerant type).
2. In "Reason for Dispatch" section, Identify the type of equipment being disposed (e. g., chiller, roof top A/C, etc.)
3. In the "Service Description" section, enter disposal date and place "X" in "Disposal" checkbox. If the recovered refrigerant will be taken offsite by a subcontractor place an "X" in the "Refrigerant Transfer " checkbox.
4. In the "Service Description notes:" section describe where the refrigerant and equipment were transferred. For example, refrigerant taken by Rapid Recover, or onsite to B404 or refrigerant yard; equipment to DUS or taken with subcontractor.
5. In the "Recovery Unit" section enter the refrigerant recovery equipment model number and serial number.
6. In the "Refrigerant Recovered" section enter the recovery cylinder ID, refrigerant type (e. g., R-410A), refrigerant condition (Usable, not usable), quantity recovered (lbs) and date of recovery. If unit is flat, place an X in the "Unit flat at "0" psi could not recover" checkbox.

Prior to delivering drained equipment to DUS or otherwise removing from site

1. Tape a copy of this form to the equipment.
2. Write your employee number and "Date Recovered: MM/DD/YYYY" on the refrigerant chamber using a paint pen.
3. Email a copy of this form to REFRIGERANT-DISPOSAL@llnl.gov

APPENDIX D
Portable Engine/Equipment Operation Log (Rev. 12/06/2024)
 (required for portable equipment ≥50 bhp operated on the LLNL campus)

SUBCONTRACTOR INFORMATION	
Subcontractor Name:	
Subcontractor Equipment ID#:	


PORTABLE EQUIPMENT INFORMATION				
<i>***Attach a copy of the equipment's CARB PERP registration certificate***</i>				
CARB PERP Registration Number:		Expiration Date:		
ENGINE DATA				
<i>***Provide a photograph of the engine's manufacturer-applied ID plate(s)***</i>				
Manufacturer Name:		Model:	Serial Number:	
Engine EPA Family ID:				
Maximum Brake Horsepower Rating (per engine data plate):				
Engine Powers a:	Generator <input type="checkbox"/>	Compressor <input type="checkbox"/>	Pump <input type="checkbox"/>	Other: <input type="checkbox"/>
Fuel Type:	Diesel <input type="checkbox"/>	Gasoline <input type="checkbox"/>	LPG/Propane <input type="checkbox"/>	Other: <input type="checkbox"/>

EQUIPMENT HOUR METER READING LOG		
<i>***Record at least once per week***</i>		
Date	Location	Hour Meter Reading
	<i>Initial Reading (prior to operation)</i>	
	<i>Final Reading (prior to leaving campus)</i>	

COMPLETED BY			
Name:		Phone #:	
Title:		Cell #:	
Signature:		Email:	

Return Completed Log to LLNL Environmental Functional Area – Air Quality Office (contact: Saira Soriano, soriano4@llnl.gov)

APPENDIX E – Insert LOTO Plan here

Lockout Tagout (LOTO) Plan		Plan#:	Date:	Rev:
	Work Document / Work Order:		Equipment / System:	
	Facility / Building:		Location:	
	Job Scope / Description:			

LOTO Type: SIMPLE COMPLEX

Hazardous Energy Sources (Types and Magnitudes)				
<input type="checkbox"/> CHEMICAL		<input type="checkbox"/> HYDRAULIC		Number of REQUIRED LOTO Points
<input type="checkbox"/> ELECTRICAL		<input type="checkbox"/> PNEUMATIC		
<input type="checkbox"/> GRAVITY		<input type="checkbox"/> THERMAL		
<input type="checkbox"/> MECHANICAL MOTION:				
<input type="checkbox"/> OTHER:				
Hazardous Energy Notes/Equipment/Prerequisites:				

	Print	Sign	Title / Company	Date
*Prepared by:				
*Approved by:				

*Preparer & Approver shall be knowledgeable of the scope of work and how to safely isolate the hazards described in this LOTO Plan.

*Approver shall be AI, RI, or designee. Preparer and Approver **shall not** be the same person.

Name	Role (Applied or Removed LOTO)	Signature	Date
	Energy Owner-Applied LOTO		
	Energy Owner-Removed LOTO		

DO NOT PROCEED WITHOUT AN APPROVED LOTO PLAN

****If at any point during the LOTO process the plan changes, PAUSE WORK. The LOTO Plan must be revised and approved by all parties involved****

Isolation Order List / Method of Procedure:

LOTO APPLICATION PROCESS		1. Prepare and Notify	2. Shutdown Equipment	3. Isolate the Energy	4. Apply LOTO Devices	5. Control Stored Energy	6. Verify and Test
Special Instructions:							
Task #	Instructions / Activities	LOTO Isolation Point Location (Building/Room)	LOTO Isolation Point Identification	LOTO Isolation Point Position (Open/Closed)	Performer Initials/Date/Time	Verifier Initials	Notes/Comments
1.							
2.							
3.							
4.							
5.							
6.	*****HOLD TO PERFORM WORK*****	*****	*****	*****	*****	*****	*****

LOTO REMOVAL PROCESS		VERIFY nonessential items are removed and affected personnel are notified and located safely away from the equipment. ENSURE equipment is operationally intact and controls are in a neutral position. REMOVE locks and tags. NOTIFY equipment owner.					
Special Instructions:							
Task #	Instructions / Activities	LOTO Isolation Point Location (Building/Room)	LOTO Isolation Point Identification	LOTO Isolation Point Position (Open/Closed)	Performer Initials/Date/Time	Verifier Initials	Notes/Comments
7.							
8.							
9.							
10.							
11.							

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1. Fill in the header:
 - a. Enter the LOTO plan number, if applicable, otherwise mark "N/A".
 - b. Date (the date of the original request or the date the plan is filled out).
 - c. Revision number for this plan, start with "0". Track all subsequent changes/modifications in sequential order (i.e., Rev 1, 2, 3, etc.).
 - d. Reference **ALL** applicable work document numbers (e.g., work control document, work order).
 - e. Equipment and/or system information (this can also include asset numbers out of the master equipment list or identifications out of different databases/programs such as enterprise asset management).
 - f. Facility and/or building.
 - g. List all room location(s) specifically where equipment is affected by application of LOTO or LOTO devices.
 - h. Include job scope and/or description of work being performed.

*****It is LLNL policy for Complex LOTO, that a written plan specific to the equipment being worked on, and appropriate authorization is required. PRO-2402 Section 5.2.3.2**

2. Check the box for whether this LOTO is simple or complex. Guidance is provided in the note box below, reference PRO-2402 Section 5.2.3 "Documenting LOTO" for additional information. Contact the hazardous energy control SME, if needed.

NOTE: Simple LOTO must meet ALL the following criteria:

- The machine or equipment has a single energy source which can be readily identified and isolated.
- A single energy isolating device will completely deenergize and deactivate the machine or equipment.
- The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shutting down, which could endanger workers.
- Work is conducted in one work location.
- The work does not require a transfer of ownership between shifts.

3. Check all boxes with applicable hazardous energy source(s). Next to associated hazardous energy source(s); enter type(s) and magnitude(s) in measurable units (e.g., volts alternating current (AC), pounds per square inch gauge (psig), bar, degrees Celsius).
4. Enter the total number of LOTO isolation points required to control hazardous energy. See Isolation Order List/ Method of Procedures **LOTO APPLICATION** table to determine all the identified isolation points.
5. Include hazardous energy notes/Equipment/Prerequisites: Examples include specific PPE, tools, or energy isolation devices required (e.g., arc flash suit, rated gloves), approach boundaries for electrical, exclusion zones for pressure).
 - a. List any details as needed to provide clarity and completeness for the benefit of the workers.
 - b. Additional permits/processes or reference documents required (e.g., Low Voltage Outage, internal procedures, equipment manuals).

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- c. Safety barricades for LOTO work areas.
 - d. Details regarding shift change.
6. Preparer – The person that completed the LOTO plan. Enter name, signature, title/company, and date.

NOTE: The LOTO plan Preparer and Approver must have the technical knowledge to understand if the plan is correct.

NOTE: The LOTO Plan Preparer and Approver SHALL NOT be the same person.

7. Approver – The Authorizing Individual, Responsible Individual or designee that is sanctioned to approve and release LOTO work. Enter name, signature, title/company, and date.
- a. More lines can be added to this section for additional validations, reviews, and approval authorities, as needed.
8. Energy Owner – The Energy Owner who Performed/Applied the LOTO. Name/Signature/Date.
9. Energy Owner – The Energy Owner who Removes the LOTO. Name/Signature/Date.
- a. Both signatures may be the same LOTO Authorized Worker. If the role is transferred, they may be two different LOTO Authorized Workers.

NOTE: The 6 Steps of LOTO shall be performed for ALL LOTOs.

The LOTO application-Special Instructions section can be expanded with additional details, as needed.

10. **LOTO APPLICATION PROCESS** table: Tasks are entered in the sequence order required to safely establish the LOTO.
- a. Special Instructions – any written information that supports the Applied LOTO tasks/instructions on the list.
 - b. Instructions / activities - add specific detailed information for each task. This section can include additional elements such as photos, drawings, schematics, etc., that is beneficial to ensuring the workers are clear on what actions are needed and are provided sufficient instruction for clarity.
- Examples:
- Make calls to responsible persons, facility manager.
 - Get clearance to de-energize.
 - Shutdown equipment.
 - Open circuit by opening breaker (i.e. Panel 931A-B3 ckt 17).
 - Perform LIVE-DEAD-LIVE check on voltage meter.
 - Perform zero energy verification.
 - List independent verification task/instruction
- c. The location of the LOTO isolation point, building and room number (e.g., R999 South end of hallway).
 - d. LOTO isolation point identification, typical examples are circuit breaker(s), valve(s), flow switch(es), etc., required to perform the energy isolation (e.g., FS-101, Panel 723A-B1 ckt 15).
 - e. LOTO isolation point position (e.g., open, closed).

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- f. Performer enters initials after each task is complete along with date and time.
- g. **If** verification is required (Independent or secondary), then have verifier initial after each task as the verification is complete along with date and time.
- h. Enter notes or comments as required (e.g., use specific isolation devices, use specific meter for zero energy verification, list isolation lock #).

NOTE: The example Energy Owner checks for both LOTO Application and Removal are included as guidance but are not intended to be a complete nor exhaustive set of verifications that the energy owner can follow without also evaluating the specific circumstances and requirements for each LOTO being performed.

The institutional LOTO policies supersede any guidance in this form instruction when conflict arises. In any cases where uncertainty exists, contact the hazardous energy control SME for assistance.

Example Energy Owner Checks for LOTO Application:

- Did you communicate to all affected personnel the equipment that will be Locked Out and purpose/scope?
- Have you located and identified all power sources, including stored energy and documented this in the LOTO Plan?
- Did you isolate all power sources (e.g., electricity, pressure, moving parts, suspended parts)?
- Have you locked out all power sources with approved locks and fill in the LOTO tag?
- Have you reviewed and confirmed all energy sources and documented them on the Equipment Log Sheet?
- Was a Pre-Job conducted and were hazards reviewed by applicable personnel?

NOTE: If required, an example of a Group LOTO Log Sheet is provided with this LOTO Plan Form. Other approved Group LOTO Log sheets may be used.

11. If applicable, print the group LOTO log sheet and have all LOTO authorized workers that are part of the LOTO sign on and off with their lock numbers, as needed. Additional log sheets can be printed. When the LOTO is complete, number the log sheet pages 1 through the total number of pages and attach to completed LOTO Plan.
12. **LOTO REMOVAL PROCESS** table. Tasks are entered in the sequence order required to safely remove the LOTO.
 - a. Special Instructions – any written information that supports the Removal LOTO tasks/instructions on the list.
 - b. LOTO removal instructions / activities - add specific detailed information for each task. Exactly as with the application instructions, this section can include additional elements such as photos, drawings, schematics, etc.

Examples:

- Make calls to responsible persons, facility manager.
- If required, ensure equipment has been inspected.

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- Get clearance prior to energizing equipment/system.
 - Energize equipment.
 - Close circuit by switching breaker (i.e., Panel 931A-B3 ckt 17).
 - Open valve (i.e., V-981 supply valve, 133RCHC02-1 supply valve).
- c. The location of the LOTO isolation point, building and room number.
- d. LOTO isolation point identification (e.g., V-981, 133RCH02-1 CTWS 2).
- e. LOTO isolation point position (e.g., open, closed).
- f. Performer enters initials after each task is complete along with date and time.
- g. If independent verification is required, have an independent verifier initial after each task as the verification is complete along with date and time.
- h. Enter notes or comments as required.

Example Energy Owner Checks for LOTO Removal:

- Did you verify all work is completed and guards are in place or install suitable barricades and/or attendants as required?
- Have you notified affected personnel and verified that it is safe to start or re-energize equipment?
- Did you walk down the system and remove all energy isolation devices?

NOTE: All personal locks can only be removed by the person that placed the lock on the energy isolation device, no other persons shall have a key or remove another worker's lock (1 Lock=1 Key).

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