

Chapter 35 – Lead Management Plan (REDACTED)

35.1 Introduction

The impetus for compiling the NASA Ames Lead Management Plan derives from the need to comply with governmental regulations and guidance literature published by governmental institutions. The NASA Ames Lead Management Plan is an effort to streamline these compliance documents into a logical and economically efficient plan.

The Ames Lead Management Plan contains Federal, State, and Local regulatory agency regulations/guidelines and NASA policy governing lead-related work. All contractors/subcontractors who conduct lead-related work for NASA must adhere to all requirements set forth in the Ames Lead Management Plan.

35.2 Applicability

This manual is applicable to: (1) all Ames Employees; and (2) all persons and entities who agree in writing to comply with this manual.

35.3 Purpose

NASA ARC has established the Ames Lead Management Plan to protect health and to address a variety of issues regarding lead-related work. The goal of the Ames Lead Management Plan is to:

1. Minimize exposure of lead to employees and visitors.
2. Comply with all pertinent, regulatory, and NASA requirements related to lead-containing materials. NASA ARC recognizes and will comply with all applicable Federal, State, and local governing regulatory agency regulations/guidelines pertaining to lead-containing materials.
3. Establish procedures for the identification, evaluation, control, disturbance, abatement, and waste storage/disposal of lead-containing material at NASA ARC.
4. Remove, enclose, encapsulate, or repair hazardous lead-containing material as required by government or NASA regulations, and as needed to protect human health.
5. Provide lead awareness training.
6. Provide California Department of Health Services (DHS)-certified lead personnel to evaluate potential lead-related hazards, sample suspect materials, and oversee lead abatement projects.
7. Eliminate the installation of new lead-containing material whenever possible.
8. Treat all painted surfaces as containing lead until laboratory documentation proves otherwise.
9. Ensure that lead-related contracted/subcontracted work is properly planned, reviewed, and conducted.

35.4 Responsibilities

All persons who manage construction or maintenance projects, disturb, handle, store, or dispose of lead-containing material located on NASA property shall conduct operations in compliance with this

policy and all applicable governing regulatory agency regulations/guidelines that pertain to lead-containing materials.

35.4.1 NASA ARC Safety Office

1. Oversee development and implementation of the Ames Lead Management Plan.
2. Provide DHS-certified (or interim certified) lead inspectors/assessors/project monitoring services for lead-related work activities as requested. This service will be implemented on a budget-reimbursable basis to the Center.
3. Review and evaluate the impact of regulatory changes on the Center.
4. As requested, provide a thorough review and evaluation of lead abatement plans, specifications, and abatement contractor submittals prior to abatement.
5. Verify that personnel who perform lead abatement work on NASA property have appropriate training and credentials to perform their assignment.
6. Approve the selection of accredited laboratories used to analyze lead bulk/air/ soil/water samples.
7. Determine the need for baseline air monitoring or wipe sampling in occupied buildings.
8. Periodically inspect the abatement area and contractor/subcontractor for compliance with the Ames Lead Management Plan.
9. Establish criteria for post-abatement clearance testing and approve re-occupancy of buildings/areas upon successful clearance testing.
10. Provide unique sampling numbers to DHS-certified lead personnel to be utilized for lead bulk/air/wipe/soil/water sampling identification.
11. Provide lead hazard awareness training to affected workers.
12. Maintain a central location for all lead management documentation.

35.4.2 Project Managers and Contracting Officer's Technical Representatives (COTRs)

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35.4.3 DHS-Certified Lead Personnel

1. Monitor compliance to the Ames Lead Management Plan.
2. Conduct or oversee bulk/air sampling as requested by the Ames Safety Office and present findings in a user-friendly format.
3. Assist in pre-lead abatement projects concerning bids, specifications, and procedures.
4. Review contractor/subcontractor submittals for compliance with the Ames Lead Management Plan.
5. Act as NASA ARC primary health and safety contact for inspection and compliance concerning lead-related work activities.
6. Conduct pre- & post-lead abatement inspections.
7. Conduct daily inspections on lead abatement projects including cleanup operations, and document these inspections (see Appendix B, section 35.14.2). Notify the project manager and contracting officer of any contractor/subcontractor deficiencies. Should any deficiency pose an imminent safety and health hazard, the DHS-certified individual may stop the project and immediately follow up with the project manager and contracting officer.

8. Determine final clearance criteria (wipe and/or air/bulk sampling) in concurrence with the Ames Safety Office.
9. Conduct area air monitoring on lead abatement projects as requested by the project manager or Ames Safety Office. Background monitoring should be conducted before conducting area monitoring.

35.4.4 General Contractors Involved in Lead-Related Work

1. Exercise supervisory authority over all work covered by this chapter. As supervisor of the entire project, the general contractor shall comply and require all subcontractors to comply with the Ames Lead Management Plan, and all regulatory requirements including but not limited to the Department of Occupational Safety and Health Administration (OSHA), California Department of Health Services (DHS), Bay Area Air Quality Management District (BAAQMD), and the Environmental Protection Agency (EPA).
2. Notify the NASA project manager immediately upon discovery of any previously unidentified lead-containing material or material suspected of containing lead.

35.4.5 Lead Abatement Contractors/Subcontractors

1. Adhere to the Ames Lead Management Plan, and all Federal, State, and local regulatory agency regulations/guidelines that pertain to lead. Any deviations from the Ames Lead Management Plan must have the approval of the NASA ARC Safety Office and the NASA project manager. NASA Ames will not be responsible for contractor's/subcontractor's failure to read and understand this chapter/policy.
2. It is the sole responsibility of the contractor/subcontractor to perform exposure assessments and determine appropriate hazard control measures. Contractors must assume that all painted surfaces located on NASA property contain lead, unless written information is provided stating that specific surface coatings do not contain lead.
3. All lead-related work, unless directed by the Ames Safety Office, shall be conducted under the surveillance of DHS-certified lead personnel who are independently procured and financed by NASA ARC and approved by the Ames Safety Office.
4. On multi-employer worksites, a contractor who performs work that requires the establishment of a regulated area shall inform other employers on the site of the nature of the employer's work with lead, of the existence of the requirements that pertain to regulated areas, and the measures taken to ensure that employees of the other employer are not exposed to lead.
5. Lead hazards at the contractor's/subcontractor's worksite shall be abated by the contractor/subcontractor who created or control the source.
6. Notify the NASA project manager immediately upon discovery of any previously unidentified lead-containing material.
7. Adhere to section 35.9 of this document, Storage /Disposal/Transportation of Waste Material.
8. The following documents must be delivered to the project manager and approved before any lead-related work is conducted:
 - Lead abatement written compliance program.
 - Site-specific health and safety plan.
 - Any/all training plans required by the scope of work.
 - Site drawings that depict contractor's/subcontractor's removal methods, containment location(s), and emergency evacuation routing.

- Contractor's/subcontractor's Hazard Communication Program, including copies of any/all Material Safety Data Sheets for materials to be utilized during performance of work.
 - Contractor's/subcontractor's Respiratory Protection Program.
 - A copy of all applicable licenses/permits.
 - A copy of contractor's/subcontractor's supervisor(s) and workers DHS certification to conduct lead-related work.
 - A copy of each employee's biological monitoring, medical evaluations, and respirator fit-test certifications.
 - A copy of hazardous waste landfill licenses/permits.
 - A copy of hazardous waste hauler's licenses/permits.
 - There shall be no deviations from the contractor's/subcontractor's approved health and safety plan without prior consent of the Safety Office and the NASA project manager.
9. All contractors/subcontractors shall be responsible for conducting personal monitoring needed to demonstrate regulatory compliance. Copies of this monitoring must be delivered to the contracting officer or representative within 48 hours. NASA may conduct area air-monitoring/wipe sampling at its discretion. Should contractors/subcontractors or NASA's monitoring results exceed regulatory limits, engineering controls and/or work practices and/or respiratory protection must be modified for compliance.
10. NASA has set the following process for clearance of buildings or areas prior to reoccupancy. A DHS-certified lead professional must evaluate the adequacy of the contractor's decontamination of the affected area before it is released for occupancy. The Ames Safety Office may be consulted for a determination of the appropriate clearance levels for air borne lead or surface dust. When soil is affected by a lead abatement project, the Environmental Services Office should be consulted to determine appropriate clearance levels for soil.
11. All work areas must be kept clean at all times, and thoroughly cleaned before the end of each shift. A DHS-certified lead project monitor must visually inspect all work areas prior to the removal of any barriers, and approve removal of barriers. NASA may conduct final clearance visual inspections and sampling at its discretion. Should any work area not pass visual inspection and/or air/wipe sampling, the contractor/subcontractor must reclean the entire work area until approval to remove barriers is granted. The contractor/subcontractor is responsible for cleaning up any lead contamination inside/outside the work area that results from the contractor's/subcontractor's actions to the satisfaction of the DHS-certified lead project monitor.
12. Any deviation from contractor's/subcontractor's original approved work plan must be submitted as a request to the contracting officer and approved before changes are implemented. The contracting officer shall have 48 hours to deny/approve procedures. NASA shall not be responsible for any job-related delays due to contractor's/subcontractor's request to change work practices/methods.

35.4.6 The NASA ARC Acquisition Office

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35.4.7 The NASA ARC Health Unit

1. Provide medical evaluations to NASA ARC employees for lead exposure as required by OSHA.
2. Schedule and recall NASA ARC employees for lead-related medical evaluations as required by OSHA.
3. Counsel concerned employees about the health risk of lead exposure.

35.5 Prohibited Lead-Related Work Activities

The following work practices and engineering controls shall not be utilized for lead-related work regardless of quantity, type, or operation:

1. Power tools that are not equipped with High Efficiency Particulate Air (HEPA)-filtered exhaust air.
2. Dry scraping, sweeping, shoveling, or other dry cleanup or removal of lead-containing material.
3. Employee rotation as a means to reduce employee exposure to lead.
4. Torch cutting, or any application of heat to a lead-containing surface.

35.6 Warning Signs

The following warning must be posted in each work area where the PEL may be exceeded:

**WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING**

35.7 Additional Regulations/References, Codes, and Practices

Contractors must know and follow all applicable Federal regulations while working on NASA property. The following regulations are routinely observed and enforced at NASA-Ames. This list is not all-inclusive:

1. Confined Space
2. Dusts, Fumes, Mists, Vapors, and Gasses
3. Electrical
4. Emergency Medical Services
5. Fire Protection and Prevention
6. Hazard Communication
7. Ladders
8. Log of Injury and Illness
9. Permits, Excavations, Trenches, Construction and Demolition, Air Tanks
10. Personal Protective Equipment
11. Safety Belts and Nets
12. Sanitation
13. Scaffolds
14. Stairways
15. Standard Railings
16. Ventilation

35.8 Analytical Laboratories

All laboratories utilized to perform lead analysis and relied upon to supply NASA with results must be American Industrial Hygiene Association (AIHA) accredited and a National Lead Laboratory Accreditation Program (NLLAP) participant.

35.9 Storage/Disposal/Transportation of Waste Material

1. All materials, whether hazardous or non-hazardous, shall be handled, stored, disposed of, and transported in accordance with the provisions of this section and any/all applicable Federal, State, County, and local regulations and guidelines. It shall be the sole responsibility of the contractor/subcontractor for compliance with this section.

2. The contractor/subcontractor shall be solely responsible for all waste sampling and characterization regulations/requirements as set forth by Federal and California Regulatory agencies, the Resource Conservation Recovery Act, and local and county agencies.
3. All waste materials, including water, shall be segregated and handled as hazardous until NASA is provided with analytical results that prove otherwise.
4. The contractor/subcontractor shall be responsible for additional testing as required for disposal purposes by the approved landfill.
5. The contractor/subcontractor must submit all licenses/permits for the proposed landfill and waste transporter for approval by the appropriate NASA personnel prior to the start of any work.
6. The contractor/subcontractor must submit a detailed letter from the approved landfill that it will accept the waste being generated from this project.
7. The contractor/subcontractor shall be responsible for the actions of the waste hauler.
8. The contractor/subcontractor must comply with the EPA and Department of Transportation regulations for waste containers, including packaging and labeling.
9. All hazardous waste generated and transported from NASA property must have a hazardous waste manifest signed by the appropriate Environmental Office personnel prior to transportation.

35.10 Recordkeeping

All lead management documents shall be centrally located in the NASA Safety Office, except as noted below. Some of the documents include:

1. Respirator Training Records (for NASA personnel).
2. Air/wipe/water/soil sampling data from abatement projects.
3. Laboratory results from air/ wipe /water/soil sampling and personnel monitoring.
4. Results from bulk sampling analysis.
5. Hazardous waste manifests (records are maintained by the Environmental Services Office).
6. Medical Surveillance Records (all medical surveillance records of NASA employees will be located in the NASA Health Unit).
7. Proof of medical surveillance and successful completion of a lead physical evaluation shall be provided to NASA Safety Office before any NASA employee engages in lead-related work.

35.11 Procedures for Special Lead Activities

Special lead work activities include:

1. Emergency Demolition/Renovation Operations:
Before any lead-related work is conducted pursuant to and classified as an emergency demolition/renovation project, the Ames Safety Office must be notified and acknowledge notification.
2. Drilling Holes:
Drilling holes into sheetrock, which is coated with lead-containing material, may be performed as described in this section. Impermeable drop cloths must be placed under/around area(s) to be drilled, and a wet sponge or shaving cream must be used during the operation to prevent airborne fiber contamination. Upon project completion, the area must be cleaned using wet methods and/or HEPA vacuums if necessary. Notification must

be provided to the Ames Safety Office, and acknowledged by the Ames Safety Office prior to any drilling operation that affects lead-coated sheetrock. All persons who conduct this work shall have, at minimum, two-hour lead awareness training.

35.12 Authority

NASA Ames adheres to and enforces this policy and all applicable Federal, State, and local governing regulatory agency regulations/guidelines that pertain to lead-containing materials including:

1. U.S. Department of Labor, Occupational Safety & Health Administration (OSHA)
 - 29 CFR Part 1910.1025 (Lead Regulations)
 - 29 CFR Part 1926.62 (Construction Lead Regulations)
 - 29 CFR Part 1910.134 (Respirator Regulations)
2. Toxic Substances Control Act (TSCA), Title 4
3. California Labor Code Sections 6501.5, 6501.7, 6501.8, and 6505.5
4. California Code of Regulations (CCR)
 - Title 8, Section 5216 (Lead Regulations)
 - Title 8, Section 1532.1 (Construction Lead Regulations)
 - Title 8 Sections 5141 & 5144 (Respirator Regulations)
 - Title 17 Division 1, Chapter 8 (Accreditation, Certification, and Work Practices for Lead-Based Paint and Lead Hazards))
5. The Department of Housing and Urban Development (HUD), Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing.
6. Resource Conservation Recovery Act (RCRA)
7. Health and Safety Code Section 25914
8. American National Standards Institute (ANSI) Fundamentals Governing the Design & Operation of Local Exhaust Systems (ANSI, Z.9.2)
9. National Electrical Code
10. National Plumbing Code
11. California Business & Professions Code Section 7058.5

35.13 Definitions

1. **Abatement:** Any measure that is designed to permanently remove lead-containing materials.
2. **Action Level:** 30 micrograms per cubic meter of air based upon an 8-hour time-weighted average (30ug/m³ TWA).
3. **Biological Monitoring:** Baseline and post abatement blood lead-level measurements. This must be conducted under the supervision of a licensed physician.
4. **Certified Industrial Hygienist:** An individual certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.
5. **Certified Supervisor:** An individual who is capable of identifying lead hazards in the workplace and who has sufficient experience and authority to take prompt corrective measures to eliminate them. The duties of a certified supervisor include at least the following:
 - Establish the negative-pressure enclosure, ensuring its integrity, and controlling entry to and exit from the enclosure. Supervise required employee exposure monitoring. Ensure that all employees who work within a negative-pressure enclosure wear the appropriate PPE and are trained in the use of appropriate methods of exposure control

and use of hygiene facilities and decontamination procedures. Ensure that engineering controls in use are in operating condition and are functioning properly.

- In addition, the certified supervisor for lead-related work at NASA must have successfully completed an EPA-approved training course for supervisors and possess interim DHS lead certification. All EPA-approved courses require annual recertification.
6. **Clean Room:** An uncontaminated room that has facilities for the storage of employees' street clothing and uncontaminated materials and equipment.
 7. **Compliance Program:** Prior to the start of each job, an employer must establish a compliance program that ensures that employees will not be exposed to airborne lead above the permissible exposure level (PEL). The plan must be written and include the following:
 - A description of specific means utilized to reduce employee exposures below the PEL.
 - Air-sampling data.
 - A schedule for implementing the program.
 - A description of the work practices, including hygiene, personal protection, and housekeeping procedures.
 - A description of arrangements regarding notifying other contractors.
 8. **Construction Work:** Construction work is defined as work for construction, alteration, and/or repair, including painting and decorating. It includes but is not limited to the following:
 - Demolition or salvage of structures where lead or materials that contain lead are present.
 - Removal or encapsulation of materials that contain lead.
 - New construction, alteration, repair, or renovation of structures, substrates, or portions thereof that contain lead, or materials that contain lead.
 - Installation of products that contain lead.
 - Lead contamination/emergency cleanup operations.
 - Transportation, disposal, storage, or containment of lead or materials that contain lead on the site or location at which construction activities are performed.
 - Maintenance operations associated with construction activities.
 - Construction work does not include making or keeping a structure, fixture, or foundation in proper condition in a routine, scheduled, or anticipated fashion.
 9. **COTR:** Contracting Officer's Technical Representative.
 10. **Critical Barriers:** One or more layers of at least six-mil polyethylene sheeting sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne lead/dust in a work area from migrating to an adjacent area.
 11. **Decontamination Area (D-Con):** An enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with lead.
 12. **Demolition:** Any operation that involves the wrecking or taking out of any load-supporting structural members of a facility.
 13. **Demolition/Renovation Survey:** A survey conducted by a DHS-accredited lead inspector to check for the presence of lead-containing materials prior to any demolition/renovation activities.

14. **DHS:** California Department of Health Services.
15. **Emergency Demolition:** Demolition carried out pursuant to an order of a State or local Government agency because the building is structurally unsound and in danger of imminent collapse.
16. **Emergency Renovation:** Renovation that is not planned but results from a sudden, unexpected event. This includes operations necessitated by equipment failures and renovations due to fire, water, or earthquake damage, or where an imminent danger to the public health may exist.
17. **Employee Exposure:** The exposure to airborne lead that would occur if the employee were not using respiratory protective equipment.
18. **Encapsulation:** A method that utilizes sealers, paints, or special bridging/encapsulating compounds to control lead.
19. **Enclosure:** An airtight, impermeable, permanent barrier constructed to surround lead-containing materials and prevent the release of lead into the air.
20. **Exposure Assessment:** An exposure assessment is accomplished by performing personal monitoring. This assessment must be redone whenever there is a change in work conditions or practices.
21. **High-Efficiency Particulate Air (HEPA) Filter:** A high-efficiency particulate air filter capable of removing particles 0.3 micrometers in diameter or larger with 99.97-percent efficiency.
22. **Lead-Based Paint:** Paint that has any detectable amounts of lead.
23. **Permissible Exposure Level:** 50 micrograms per cubic centimeter of air based upon an 8 hour time-weighted average (50ug/m³ TWA).
24. **Project Manager:** An individual assigned to a specified project with the ultimate decision-making authority and responsibility for the project.
25. **Removal:** All operations where lead-containing materials are taken out or stripped from structures or substrates (this includes demolition operations).
26. **Renovation:** Any operation that involves altering a facility or one or more facility components in any way.
27. **Site-Specific Health and Safety Plan:** A non-generic Health and Safety Plan. This plan must be submitted prior to the start of any lead-related construction work. The plan must include all methods utilized for compliance with the NASA Lead Management Plan, and all Federal, State, and local governing regulatory agency regulations/guidelines that pertain to lead. The plan must include all safety precautions and training appropriate/necessary to complete the scope of work as related to the specific contract. The plan must contain drawings that depict contractor's/subcontractor's abatement strategies/methods and containment(s) and negative- air machine(s) locations. The NASA ARC project manager must approve this plan before any lead-related work is conducted.

35.14 Appendices

35.14.1 Appendix A: Asbestos and Lead Survey Form

General Survey Information - Suspect Asbestos and/or Lead Survey				
Task No.:	Date Task Was Issued:	Name of Contact:	Organization Code:	Permit Number (If Applicable):
Building No.:	Room or Specific Area:		Scope of Task:	
Type of Survey Conducted:		Check	Reason Survey Was Requested:	
Asbestos-Containing Material:			Planned or Upcoming Renovation or Repair	
Lead-Bearing Paint/Coating:			Unplanned or Emergency Renovation or Repair	
Other:			Other:	
Name of Certified Asbestos Consultant/DHS Certified Lead Inspector/Project Monitor:			Certification No.:	
Specific Survey Information				
Were suspect asbestos-containing materials present?		Yes or No	Number of suspect materials identified/evaluated:	
Were suspect lead-bearing paint/coatings present?		Yes or No	Asbestos:	Lead:
Name and address of laboratory used:		Lab Certifications:	Check	Number of samples collected:
		EPA NVLAP		Asbestos:
		AIHA ELLAP		Lead:
Analytical Methods Utilized:		Check	General Comments Regarding Survey:	
Polarized Light Microscopy:				
Transmission Electron Microscope:				
Scanning Electron Microscope:				
Atomic Absorption:				
X-Ray Fluorescence:				
Other:				
Findings & Results of Survey/Further Action				
Asbestos			Lead	
Examples Include: Asbestos/Lead Management Plans, Regulation Citations, Certified/Licensed Contractor, etc.				
Check any attachments included:				
Table(s) Analytical Results:		Sample Documentation Forms:		Sample Location Map:
Chain-of-Custody Forms:		Asbestos Submittal:		Lead Compliance Plan:
Laboratory Results:		(Other):		(Other):
Other (describe):				
Consultant's Signature:			Date:	

35.14.2 Appendix B: Lead Removal Inspection Form

General Project Information			
Task No.:	Date Task Was Issued:	Name of Project:	
Building No.:	Room or Specific Area:		
Name of Contact:		Organization Code:	Name of Contractor:
Name of Consultant:		Name of DHS Certified Project Monitor:	Certification No.:
Specific Project Information			
Type(s) of Work Being Performed:			
Materials Being Removed:		Deficiencies noted during Abatement/Corrective Action:	
Project Timeline:		Name of Supervisor:	Number of Workers:
		Project Submittals:	
Quantity of Waste Generated on Project:			
Disposal Site and Transporter Information:			
Final Air Clearance Protocol			
		Please explain if no clearance was required:	
Clearance protocol used:			
General sample information:		Post-abatement visual inspection protocol used:	

END OF DOCUMENT