

CHAPTER 23 – LEAD-CONTAINING MATERIALS

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CHAPTER 23 – LEAD-CONTAINING MATERIALS

A. INTRODUCTION

1. It is the policy of the Smithsonian Institution to protect its employees, contractors, visitors, housing occupants, and child-occupied facility clients from the exposure hazards associated with lead.
2. This Chapter applies to all SI facilities with lead-containing materials (LCM) (e.g., building materials, collection objects, other work materials) and to SI operations involving the handling or disturbance of LCM.
3. This Chapter establishes requirements for safely working with LCM, to include hazard identification and exposure assessment, safe work and waste disposal practices, training and recordkeeping.
4. This Chapter also establishes SI policy for complying with regulations governing lead-based paint abatement, inspection, and risk assessment activities when conducted by SI staff. Contractor activities involving disturbance of LCM shall be done in accordance with [SI Construction Specification Section 028300, “Work Activities Impacting Lead Containing Materials.”](#)
5. In implementing this Chapter, the SI will comply with all applicable federal, state, and local regulations and guidelines, including:
 - a. Occupational Safety and Health Administration (OSHA) Standard [29 CFR 1910.1025, \(Lead General Industry\)](#);
 - b. OSHA Standard [29 CFR 1926.62, Lead \(Construction\)](#);
 - c. The U.S. Environmental Protection Agency (EPA) [40 CFR 745 Lead-Based Paint Poisoning Prevention in Certain Residential Structures](#); and
 - d. The U.S. Department of Housing and Urban Development (HUD) [24 CFR 35, Lead-Based Paint Poisoning Prevention in Certain Residential Structures](#).
 - e. The U.S. Department of Housing and Urban Development [Guidelines for the Evaluation and Control of Lead-Based Hazards in Housing](#)

B. CHAPTER-SPECIFIC ROLES AND RESPONSIBILITIES

1. Safety Coordinators shall:
 - a. Maintain a record of identified LCM and lead-based paint (LBP) locations in their facilities.
 - b. Ensure that all contracted work in their facility be assessed as to whether it will impact LCM or LBP, and if so, ensure that contractor work involving disturbance of LCM or LBP in their facilities is properly reviewed for compliance with the SI Construction Specification 028300.
 - c. Ensure that facility staff assigned tasks that may involve exposure to lead are identified to the Office of Safety, Health, and Environmental Management (OSHEM) for exposure assessment and development of exposure controls.
 - d. Assist supervisors in implementing the hazard controls specified in this Chapter and by OSHEM to maintain exposure and environmental contamination levels to below those specified in [Attachment 1](#).
 - e. Ensure that the training and/or certification and licensing requirements of this Chapter are met.
 - f. Ensure that the provisions of this Chapter are implemented regarding SI-owned housing or child-occupied facilities, as applicable.
2. Supervisors shall:
 - a. Identify, with the assistance of the Safety Coordinator, work tasks under their control that involve working with LCM or LBP. Identify employees who may be exposed to lead to their facility safety coordinator and OSHEM for exposure assessment.
 - b. Ensure that OSHEM-recommended engineering and other control measures are implemented to reduce exposures as low as reasonably achievable but, as a minimum, to below the OSHA Permissible Exposure Limit of 50 micrograms of lead per cubic meter of air ($\mu\text{g}/\text{m}^3$) as an 8-hour time-weighted average (TWA) concentration.
 - c. Ensure that all employees who are potentially exposed to lead concentrations equal to or greater than the OSHA Action Level of 30 $\mu\text{g}/\text{m}^3$ (8-hour TWA) are enrolled, per OSHEM recommendation, in the SI medical surveillance program specified in this Chapter.

- d. Ensure that all employees working on or around LCM and LBP, whose work may disturb lead, are currently trained (and certified and licensed if applicable) in accordance with the requirements of this Chapter.
3. Employees shall:
- a. Abide by the work practices, personal protective equipment and medical surveillance requirements of this Chapter.
 - b. Inform supervisors of any situations that could potentially pose lead contamination or LBP exposure hazards.
4. Office of Facilities Engineering and Operations (OFEO): Office of Engineering Design and Construction, and Office of Facilities Management and Reliability shall:
- a. Ensure that LCM and LBP inspections are conducted by an EPA-certified and state-licensed Lead Inspector prior to construction or renovation projects under their respective control.
 - b. Serve as the Contracting Officers Technical Representative (COTR) for all contractor construction, renovation, and/or demolition projects involving LCM. Ensure this work and associated recordkeeping is conducted in accordance with SI Construction Specification Section 028300, "Work Activities Impacting Lead Containing Materials," and ensure these specifications are regularly revised pursuant to OSHEM advice. Contractor's work plans shall be reviewed and approved by OSHEM prior to start of work.
 - c. Ensure project managers and COTRs are knowledgeable of LCM and LBP locations within their assigned areas of responsibility, and are knowledgeable of applicable LBP abatement regulations and work practices as defined in the SI Construction Specification Section 028300, "Work Activities Impacting Lead Containing Materials."
 - d. Maintain files of all documentation and regulatory records required by contract specifications for each LBP abatement project under their respective control.
5. OFEO Real Estate Division shall:
- a. Ensure that all facilities considered for acquisition or lease by the SI are inspected for LBP and other LCM prior to acquisition.
 - b. Provide OSHEM with a list of all housing properties under SI ownership, and assist in complying with the provisions of this Chapter relative to

federal and state/local lead-hazard reduction and tenant notification requirements.

6. Office of the Chief Information Officer (OCIO) shall:
 - a. Ensure that service or other contractors directly under its control are aware of LBP locations in their areas of contract work, and be required to follow applicable OSHA safety and health provisions, in addition to Smithsonian policy regarding working on or around LCM and LBP and SI Construction Specification Section 028300, "Work Activities Impacting Lead Containing Materials",
 - b. Ensure that service contractors submit their LCM and LBP control procedures, per submittal requirements of the SI Construction Specification Section 028300, "Work Activities Impacting Lead Containing Materials" and subject to review and approval by OSHEM, prior to the start of work.
 - c. Ensure OCIO employees and OCIO COTRs are knowledgeable of LCM and LBP locations within their assigned projects, and are knowledgeable of applicable lead abatement regulations and work practices as defined in the SI Construction Specification Section 028300, "Work Activities Impacting Lead Containing Materials".
7. Office of Safety, Health and Environmental Management (OSHEM) shall:
 - a. Provide technical assistance to Directors in carrying out their responsibilities under this Chapter, including: assistance in conducting LCM and LBP inspections, assistance in revising contractor specifications for LCM and LBP work projects, reviewing and approving construction projects involving LCM and LBP abatement, coordinating or providing required training, and assistance in developing SI staff work procedures.
 - b. Conduct exposure assessments and medical surveillance for SI staff exposed to lead, and provide affected employees and supervisors with documentation of results and recommendations for further actions.
 - c. Maintain medical monitoring and surveillance examinations as required by OSHA standards and [Chapters 8, "Program Reporting and Recordkeeping Procedures"](#), and [39, "Exposure Assessment and Medical Surveillance"](#), of this *Manual*.
 - d. Conduct lead awareness training as required by this Chapter.

C. HAZARD IDENTIFICATION

1. Supervisors, with assistance of Safety Coordinators and OSHEM, will identify tasks that pose the potential for employee exposure to lead, in order to assess the exposure and develop controls to mitigate the hazard. Examples of tasks that involve contact with lead-containing materials include:
 - a. soldering, welding, torching, brazing, or cutting on lead materials,
 - b. spray painting with lead-based paint,
 - c. abrasive blasting on lead-coated or lead-containing substrates,
 - d. handling of lead-containing collections objects,
 - e. cleaning surfaces covered with lead dust or paint chips, and
 - f. LBP abatement, interim controls (e.g., paint film stabilization), construction, renovations, or general maintenance and repair,
2. For purposes of meeting the requirements of this Chapter, the following definitions apply:
 - a. Lead-containing materials (LCM) are any materials that contain or are coated with a detectable quantity of lead, which then mandates OSHA requirements for employee monitoring and protection.
 - b. Lead-based paint (LBP) is defined as paint or other surface coatings that contain lead equal to or greater than 1.0 milligram per square centimeter of surface area, or 0.5 percent by weight or 5,000 parts per million by weight, as defined by the USEPA mandating licensed abatement actions. As state and local jurisdictions may recognize lower concentrations of lead as the definition of LBP, the more stringent (i.e., lower) shall take precedence.
3. Testing and analysis for lead shall follow the protocols in [Attachment 1](#).
4. Maximum allowable environmental concentrations of lead in soil, water, and surface dust are detailed in [Attachment 2](#).
5. If the presence of lead on a facility structure is unknown, and the structure in which work is being performed was built before 1978, it shall be assumed that lead is present in painted surfaces and other building materials. All potable water piping solder joints prior to 1986 shall be assumed to contain lead.

6. Personal Exposure Monitoring

- a. When notified by a facility of a work task that may be covered by this Chapter, OSHEM shall conduct initial and periodic assessments to determine the extent of potential employee exposure from that task, in accordance with [Chapter 39, "Exposure Assessment and Medical Surveillance"](#), of this *Manual*. Monitoring frequency, protocols and assessment of risk will be in accordance with requirements of either OSHA 29 CFR 1910.1025 (general industry) or OSHA 29 CFR 1926.62 (construction, renovation, repair and maintenance activities), whichever is applicable. Results of the hazard assessment will form the basis for further medical surveillance measures, personal protective equipment, and work practice controls.
- b. Within 5 working days of receiving personal exposure monitoring results, OSHEM shall notify, in writing, the affected employee(s) and their supervisor(s) of the results and any recommendations for corrective action, as warranted.

D. HAZARD CONTROL

1. Limits on Use

- a. Only "non-lead paint" (defined by the U.S. Consumer Product Safety Commission as containing less than 0.06 percent dry weight of lead) is to be used on any interior or exterior surface in SI-owned housing, any other interior facility surface, or any facility area that contains a child-occupied facility or affects a play area.
 - b. Only "lead free" pipe, solder or flux may be used in the installation or repair of any plumbing in residential or non-residential facility providing water for human consumption, which is connected to a Public Water System (Section 1417 (a) (i), Safe Drinking Water Act [SDWA]). Under section 1417(d), of the act, "lead free" means that solders and flux may not contain more than 0.2 percent lead, and pipes, pipe fittings, and well pumps may not contain more than 8.0 percent lead.
 - c. The use of lead in associated roofing materials shall be minimized to the greatest extent possible. New application of lead-coated copper roofs is prohibited.
2. Actions to be Taken Prior to the Start of Construction, Renovation, Repair, Painting and Maintenance Activities Performed by SI Staff
 - a. Prior to work as defined in 6.c above, in an SI facility that may disturb

suspect LCM surfaces, the presence and location of LBP/LCM/lead contamination within the work area must be verified using existing facility survey reports and/or new inspection reports. Inspections shall be conducted in accordance with this Chapter and its Attachments.

- b. All surfaces painted prior to 1978 within the work area must be presumed to contain lead until an inspection is conducted, or documentation shows lead abatement work was performed. All potable water piping solder joints prior to 1986 must be presumed to contain lead.
3. Additional Work Practice Requirements for Construction, Renovation, Repair, Painting and Maintenance Activities by SI Staff
 - a. Work practices for abatement, construction, renovation, repair, painting or maintenance activities shall follow applicable sections in OSHA 29 CFR 1910.1025, 29 CFR 1926.62, the EPA Renovation, Repair and Painting (RRP) Rule and the SI Construction Specification Section 028300, "Work Activities Impacting Lead Containing Materials". Requirements outlined in HUD 24 CFR Part 35 Lead Safe Housing Rule shall apply for activities conducted in residential housing. Abatement and interim control work that disturbs LCM or LBP on more than 2 square feet of interior surface, 20 square feet on exterior surfaces, or 10 percent of the total surface area on an interior or exterior type of component with a small surface area (e.g., window sills, baseboards, trim) shall only be done by a certified and licensed lead abatement contractor or by staff trained, certified, and licensed in accordance with Section H of this Chapter.
 - b. Detailed information on work practice methodologies is located in "HUD: Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing."
 - c. All work on lead-containing surfaces that will generate airborne dust, fume, or mist, shall be conducted under the appropriate local exhaust ventilation system to reduce potential employee exposures to below 30 $\mu\text{g}/\text{m}^3$ (8-hour TWA).
 - d. All lead-contaminated debris, vacuum cleaner bags and filters, cloths, mop heads, protective clothing, and respirator filters must be disposed of as lead waste according to SI policy and the procedures of this Chapter.
 - e. Surface clearance levels shall be used when hazard reduction is the goal of the work being performed, and to arrange for testing of the materials suspected of containing lead/lead shall follow the SI Construction Specification Section 028300, "Work Activities Impacting Lead Containing Materials". Methodologies to be consulted include EPA: *Residential Soil*

Sampling for Lead: Protocols for Dust and Soil Sampling (EPA Report No. 7474-R-95-001).

4. Performance of Work

- a. At a minimum, all renovation, repair and painting work disturbing lead-based paint (LBP), or paint that has not been tested for lead content, in pre-1978 SI-owned/leased facilities, housing and child-occupied facilities, must be conducted in accordance with the requirements of the *EPA Final Rule on Lead; Renovation, Repair and Painting Program (RRP)* and rule revisions. The rule applies to maintenance and repair activities where 6 square feet or more of paint is disturbed in a room, or where 20 square feet or more of paint is disturbed on the exterior. Employees/individuals performing this work must be Certified Renovators who are trained by EPA-approved training providers to follow lead-safe work practices.
- b. Lead-based paint hazards generated by renovation, repair and painting work shall be adequately cleaned after work is finished and before the work areas are re-occupied. Visual inspection and dust wipe clearance testing of the work areas after tasks shall be performed by an accredited Dust Sampling Technician, Inspector Technician, or Risk Assessor in accordance with the regulations.
- c. The cleaning verification (CV) card testing option for clearance will not be accepted unless approved by OSHEM.

5. Prohibited Work Practices.

The following work practices shall not be used for lead-related work:

- a. Open flame burning or torching.
- b. Machine sanding or grinding without a high-efficiency particulate air (HEPA) local exhaust control.
- c. Abrasive blasting or sandblasting without HEPA local exhaust control.
- d. Heat guns operating above 1100 degrees Fahrenheit or charring the paint.
- e. Dry sanding or dry scraping, except dry scraping with heat guns or within 1.0 foot of electrical outlets, or when treating defective paint spots totaling no more than 2 square feet in any one interior room or space, or totaling no more than 20 square feet on exterior surfaces.

- f. Paint stripping in poorly ventilated space using a volatile stripper that is a hazardous substance (e.g., methylene chloride).
 - g. Cleaning by compressed air unless used in conjunction with a ventilation system designed to capture the airborne dust.
6. Safe Work Practices
- a. Supervisors/employees must suspend work activities and notify the Safety Coordinator for further evaluation when suspected LCM/lead is encountered and may be disturbed without proper controls and PPE in place.
 - b. Safe work practices shall be established by the supervisor for areas or job tasks in which a lead hazard is known or suspected. These shall include, as a minimum:
 - (1) Prevent unnecessary access to the work site.
 - (2) Carefully clean work site ongoing throughout the day in addition to a final meticulous clean-up at the conclusion of the job. Cleaning efforts must be effective in removing lead contaminated dust.
 - (3) Use a high-efficiency particulate (HEPA) vacuum attachment with power tools.
 - (4) Use wet methods such as misting surfaces before scraping to minimize the dispersion of lead contaminated dust.
 - (5) Use foot coverings or dedicated footwear to minimize the tracking of lead dust out of the work area.
 - (6) Employees conducting work, in areas where airborne exposures are expected to meet or exceed regulatory limits for lead exposure, shall shower at the end of their work shift. No clothing or equipment worn during this work shift shall leave the workplace. Employees shall wash their hands and face prior to eating, drinking, smoking, using the rest room, or applying cosmetics.
 - (7) Employees shall not eat, drink, smoke, or apply cosmetics in work areas where lead contamination is possible.
 - (8) All walking and working surfaces shall be maintained as free as practicable from accumulations of lead debris. Surface cleaning of lead debris or paint chips is to be done whenever possible by HEPA-

filtered vacuum cleaning. Wet sweeping, wet shoveling or wet brushing may be used only when vacuuming has been found to be ineffective.

7. Labels, Signage and Other Forms of Warning

- a. Lead hazard areas shall be marked with boundary tape and warning signs reading, "WARNING, LEAD WORK AREA, POISON, NO SMOKING OR EATING." Lead-contaminated equipment and debris shall also be marked with a warning of the lead hazard.
- b. Signage shall be posted immediately outside all entrances and exits to the lead work area at least 3 days in advance of removing or encapsulating lead paint except, that in emergency situations, posting shall be done as soon as possible. Each sign must be at least 20" by 14", state the date and place of the lead abatement project, and include the phrase "Caution Lead Hazard, Keep Out" in bold lettering at least 2 inches high.
- c. Lead-containing collections objects shall have a caution notation (e.g., "Caution: Contains Lead") on its tag and/or record so that unnecessary handling and exposure may be avoided.
- d. The presence of LCM/lead contamination shall be disclosed in the accompanying paperwork for all collections objects, and for all property transfers, including loans and property surplus actions. If possible, the property itself shall be labeled.

8. Personal Protective Equipment

- a. All respirators used to protect Smithsonian employees from lead exposure must conform to OSHA requirements specified in 29 CFR 1910.134, 1910.1025, 1926.62, and [Chapter 18, "Respiratory Protection"](#), of this *Manual*. All employees whose work requires the use of respiratory protection shall be medically approved to wear a respirator, fit-tested and properly trained in their use and maintenance by OSHEM. The minimum acceptable respirator for protection against lead is a half-mask, air-purifying type equipped with P100 (HEPA) filters. Until an exposure assessment can be completed by OSHEM, the respirator-type selection will be based on exposure assumptions as detailed in 29 CFR 1926.62.
- b. When body/clothing contamination by lead is possible in the course of work covered by this Chapter, an appropriate selection of protective equipment shall be worn (e.g., disposable whole-body coveralls, head covering, gloves, and/or foot coverings, and/or eye protection) and maintained, in accordance with [Chapter 17, "Personal Protective](#)

[Equipment](#)", of this *Manual*. All disposable protective clothing shall be placed in labeled containers for hazardous waste disposal in accordance with this Chapter. If non-disposable work clothing becomes contaminated with surface dust, it shall be cleaned by HEPA-vacuuming, or other method that removes dust without causing the lead to become airborne, before leaving the work site.

- c. Employees conducting work in areas where airborne exposures are expected to be meet or exceed $50 \mu\text{g}/\text{m}^3$ (8-hour TWA), shall shower at the end of their work shift. No clothing or equipment worn during this work shift shall leave the workplace. Employees are to wash their hands and face prior to eating, drinking, or smoking (activities that shall not be conducted in the work area).
- d. Gloves and other dermal protection shall be used when handling lead-containing collections objects.

9. Medical Surveillance

- a. Initial medical surveillance shall be provided, by OSHEM, to all Smithsonian employees currently certified through an EPA-approved training provider as lead workers or supervisors, and other staff who are potentially exposed to lead dust concentrations equal to or greater than $30 \mu\text{g}/\text{m}^3$ (8-hour TWA). This program shall include, as a minimum, baseline biological monitoring and respirator medical clearance to be completed before the employee(s) is allowed to work with or around lead and lead-based paint.
- b. Periodic medical surveillance shall be provided, by OSHEM, to all Smithsonian employees who are potentially exposed to lead dust concentrations equal to or greater than $30 \mu\text{g}/\text{m}^3$ (8-hour TWA) *for more than 30 days in any year*.
- c. The medical surveillance program shall include requirements of 29 CFR 1926.62(j) and 29 CFR 1910.1025(j) and appropriate local guidelines and regulations.
- d. Any employee with elevated blood lead levels, as specified in 29 CFR 1926.62(k) and 29 CFR 1910.1025(k), shall be covered by a medical removal protection program, as established by OSHEM.

10. Construction and Maintenance Compliance Plan.

Supervisors of employees engaging in lead work shall develop an OSHA Compliance Plan, in accordance with 29 CFR 1926.62(e) (2) and the example in [Attachment 1](#) of this Chapter. This plan is to be reviewed every

six months and updated, as necessary, to reflect the status of the program.

E. REQUIREMENTS FOR SMITHSONIAN-OWNED HOUSING

1. Smithsonian-owned housing constructed prior to 1978 shall be evaluated for the presence of LBP, LCM and LCM hazards for protecting young children from the health hazards associated with lead exposure by a certified "Lead Inspector/Risk Assessor", in accordance with the requirements of EPA 40 CFR Part 745 and the HUD Guidelines, Chapters 5 and 7.
2. Based on the evaluation results, a hazard reduction plan shall be developed by a certified "Lead Inspector/Risk Assessor" and implemented to include abatement and/or interim controls for each LCM hazard identified. Copies of an EPA-approved lead information pamphlet (such as (Protect Your Family From Lead in Your Home, EPA #747-K-99-001) and (Protect Your Child from Lead Poisoning) shall be given to each tenant.
3. All LCM activities, including work methods and post-abatement clearance procedures shall follow the requirements of EPA 40 CFR Part 745, OSHA Lead, Construction Standard 29 CFR 1926.62, and the SI Construction Specification Section 028300, "Work Activities Impacting Lead Containing Materials".
4. The SI shall provide a notice of evaluation and/or abatement to occupants and the jurisdiction having authority of the housing within 15 calendar days of receipt of the evaluation report and/or completion of hazard reduction activities. Such notice will follow the format specified in 24 CFR 35.125, 24 CFR 35.130, and/or 24 CFR Subpart A.
5. Prior to the closing of a sale of SI property constructed before 1960, the SI shall conduct a risk assessment and a LCM and LBP inspection in accordance with EPA 40 CFR 745.227 and the HUD Guidelines, Chapters 5 and 7. The SI is responsible for completion of abatement of identified LBP hazards prior to the closing of the sale, or in assuring that abatement is carried out by the purchaser before occupancy of the property, pursuant to HUD 24 CFR 35, Subpart C.
6. Prior to the sale of SI property constructed after 1959 and before 1978, the SI shall conduct a risk assessment and LCM and LBP inspection in accordance with EPA 40 CFR 745.227 and the HUD Guidelines, Chapters 5 and 7. The evaluation shall be completed before the closing of the sale, and the results shall be made available to prospective purchasers, in accordance with HUD 24 CFR 35, Subpart A.

F. REQUIREMENTS FOR SMITHSONIAN-OWNED CHILD OCCUPIED FACILITIES

1. Smithsonian-owned child-occupied facilities, including play areas, shall be evaluated for the presence of lead and LBP hazards, in accordance with the requirements of EPA and for protecting young children from the health hazards associated with lead exposure. All SI-owned child-occupied facilities, including the Smithsonian Early Enrichment Centers, and spaces hosting programs meeting the definition “child occupied facilities” (Section 2.B.3) of this Chapter, shall be certified as being free of lead hazards by a certified inspector/risk assessor. If the evaluation reveals the existence of lead or LBP hazards, a hazard reduction plan shall be immediately implemented to include abatement and/or interim controls for each lead or LBP hazard identified.
2. Prior to the renovating space for use as a SI child-occupied facility, the space to be used is to be evaluated for lead and LBP hazards, in accordance with the requirements of EPA 40 CFR Part 745. All lead and LBP hazards identified are to be abated prior to occupancy.
3. All LCM and LBP activities, including work methods and post-abatement clearance procedures shall follow the requirements of EPA 40 CFR Part 745, OSHA 29 CFR 1926.62, and the SI Construction Specification Section 028300, “Work Activities Impacting Lead Containing Materials.”

G. WASTE DISPOSAL

1. All lead-contaminate debris, vacuum cleaner bags and filters, cloths, mop heads, protective clothing and respirator filters must be disposed as lead waste, pursuant to SI policy. The SI facility Hazardous Waste Coordinator (HWC) shall assist in the management of hazardous waste from work generating lead-contaminated waste by SI employees. Contactors who generate a lead waste stream from SI facilities are subject to the terms of their contract.
2. All lead-related waste disposal shall follow the requirements of the SI Hazardous Waste Management program (refer to [Chapter 29, “Hazardous Waste Management”](#), of this *Manual*), and the requirements of the SI Construction Specification Section 028300, “Work Activities Impacting Lead Containing Materials.
3. The waste generator (i.e., either contractor or SI) shall segregate the

abatement waste into distinct waste streams (e.g., disposable suits, lead-contaminated polyethylene sheeting, lead-contaminated waste water, hazardous chemical sludge, etc). The waste generator (through the facility HWC) shall submit samples to an accredited laboratory for Toxicity Characteristic Leachate Procedure (TCLP) analysis.

4. Waste shall be considered as “hazardous waste” for the purpose of disposal if the results of the TCLP indicate a lead leachate concentration of greater than or equal to 5 parts per million (ppm), or if the waste meets other EPA hazardous waste regulatory definitions.
5. Hazardous lead waste shall be containerized securely, according to EPA, Department of Transportation (DOT), and all applicable federal, state, and local regulations for hazardous waste containers. Each container shall be labeled with the words “HAZARDOUS WASTE”, and marked with its accumulation start date. A Profile Sheet shall accompany/be affixed to each container that includes all major constituents and hazardous components of the waste by chemical name. Acronyms or trade names shall not be used.
6. All non-hazardous lead waste may be contained in either sealed disposal drums, or two layers of 6-mil thick poly sheeting or poly bags, sealed with adhesive spray and/or duct tape.
7. Lead waste from lead-abatement projects conducted in residential or child-occupied facilities must be removed from the jobsite within 48 hours after completing cleanup. All other hazardous waste must be removed from the site of a lead abatement project within 90 days of completion of the project. Disposal of all hazardous waste must be in compliance with all applicable hazardous waste regulations. The facility Hazardous Waste Coordinator shall retain copies of all related paperwork including Hazardous Material Profile Sheets and completed Hazardous Waste Manifests.
8. All hazardous waste shall be transported by a licensed hazardous waste transporter to an approved/licensed treatment, storage and disposal facility (TSDF). The licensed hazardous waste transporter shall provide evidence of previous experience transporting lead-contaminated waste. The licensed hazardous waste transporter shall provide permanent labeling for all containers, as required by federal, state, and local regulations.

H. TRAINING

1. Work activities impacting lead-containing material must be conducted by personnel trained and accredited in accordance with state or federal requirements for the location where the work is being performed. At a minimum

lead awareness training must be provided in accordance with OSHA Standard 29 CFR 1926.62, Lead in Construction.

2. SI staff potentially exposed to lead hazards shall receive annual "Lead Hazard Awareness" training from OSHEM. This training shall meet the requirements of both OSHA 29 CFR 1910.1025, (General Industry) and 29 CFR 1926.62, (Construction);
3. Any employee conducting LBP abatement, inspections, risk assessments, or project design, for the express purpose of hazard reduction, shall be certified and/or licensed in the appropriate State of employment. Certification and licensing fees will be the responsibility of the Smithsonian Institution.

I. RECORDS AND REPORTS

1. OSHEM shall maintain records of personal and environmental monitoring for lead, related medical surveillance records, for at least 40 years, or the duration of the worker's employment plus 30 years, whichever is longer.
2. Facilities shall maintain all employee training records for 1 year beyond the last date of employment of each employee.
3. OFEO shall maintain all records of SI lead-based paint assessments for an indefinite period of no less than 75 years.
4. OSHEM shall maintain all records of OSHEM-conducted bulk sample analyses for an indefinite period of no less than 75 years.
5. Lead-based paint inspection reports and bulk sample identification records obtained independently by a facility (i.e., not by OFEO and/or OSHEM) shall be maintained by that facility for an indefinite period of no less than 75 years.
6. Hazardous waste generators shall maintain their respective lead waste manifests for an indefinite period of no less than 75 years.

J. REFERENCES

1. **OSHA: U.S. Department of Labor, Occupational Safety and Health Administration**, including but not limited to:
 - a. OSHA Respiratory Protection Standard 29 CFR 1910.134
 - b. OSHA General Industry Lead Standard 29 CFR 1910.1025

- c. OSHA Lead, Construction Standard 29 CFR 1926.62
- 2. **DOT: Department of Transportation** but not limited to the 49 CFR Parts 171 and 172 Hazardous Substances
- 3. **EPA: U.S. Environmental Protection Agency**, including but not limited to:
 - a. 40 CFR 260 and 265 Resource Conservation and Recovery Act (RCRA)
 - b. 40 CFR 745 Lead-Based Paint Activities: Training, Certification, and Work Practice Requirements
 - c. Title 42 of United States Code (42 U.S.C.) Safe Drinking Water Act
 - d. 40 CFR 141.80 National Primary Drinking Water Regulations
- 4. **HUD: U.S. Department of Housing and Urban Development**, including, but not limited to the 24 CFR 35 Lead-Based Paint Poisoning Prevention in certain Residential Structures and Part 58 Environmental Procedures for Entities Assuming HUD Environmental Responsibilities
- 5. **STATE LEAD-BASED PAINT ACTIVITIES (Abatement & Licensing Requirements)**
 - a. Arizona Department of Environmental Quality
<http://www.azdeq.gov/environ/air/plan/lead.html>
 - b. Arizona Department of Health Services
<http://azdhs.gov/phs/oeh/invsurv/lead/>
 - c. District of Columbia
http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495190,ddoeNav_GID,1486,ddoeNav_31375|31377|.asp
 - d. Florida Department of Health
http://floridashealth.com/Environment/medicine/lead/Protective_Policy_Workgroup.htm
 - e. Florida Department of the Environment
http://www.dep.state.fl.us/secretary/news/2009/01/0128_01.htm
 - f. Hawaii Department of Health Lead Laws
<http://hawaii.gov/health/environmental/noise/about.html>
 - g. Maryland Department of the Environment
<http://www.mde.maryland.gov/programs/Land/LeadPoisoningPrevention/Pages/Programs/LandPrograms/LeadCoordination/index.aspx>

- h. Maryland Occupational Safety and Health (MOSH)
<http://www.dllr.state.md.us/labor/mosh/>
- i. Massachusetts Lead Laws
<http://www.lawlib.state.ma.us/subject/about/lead.html>
- j. Massachusetts Department of Environmental Protection
http://www.mass.gov/dep/air/aq/aq_lead.htm
- k. New York City Department of Housing Preservation & Development (HPD)
http://www.nyc.gov/html/hpd/html/homeowners/lead_paint.shtml
- l. New York City Lead Laws
<http://www.nyc.gov/html/doh/html/lead/lead.shtml>
- m. New York State Department of Environmental Conservation
<http://www.dec.ny.gov/outdoor/9223.html>
- n. New York State Department of Health Lead Laws
http://www.health.state.ny.us/environmental/lead/laws_and_regulations/index.htm
- o. New York State Department of Health Public Health Laws
http://www.health.state.ny.us/regulations/public_health_law/article_13/title_10/index.htm
- p. Virginia Department of Professional and Occupational Regulation (DPOR): DPOR is responsible for all company and individual licensure in Virginia.
<http://www.dpor.virginia.gov/dporweb/dpormainwelcome.cfm>
- q. Virginia Department of Environmental Quality
<http://www.deq.state.va.us/>

Lead Monitoring, Testing and Analysis Procedures

1. Laboratories used to conduct lead analyses shall participate in the EPA's National Lead Laboratory Accreditation Program, NLLAP.
2. Sampling for lead-in-paint shall be performed by persons trained and licensed by the appropriate state and local agencies to perform lead inspections. Sampling shall be performed generally following the protocols included in HUD's "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing" Chapter 7 – 1997 version using either an XRF Lead Paint Analyzer or by bulk paint chip sampling. Analysis of bulk paint chips for lead shall be performed by an accredited laboratory.
3. Sampling for lead-in-air shall be performed generally following the "Sampling Airborne Particulate for Lead (NIOSH Method 7082)" procedure as outlined in HUD's "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing".
4. Lead dust wipe sampling shall be performed generally following the "Wipe Sampling for Settled Lead-Contaminated Dust" procedure as outlined in HUD's "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing".
5. Lead-in-soil sampling shall be performed generally following the procedures outlined in HUD's "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing".
6. Bulk samples of waste for TCLP analysis shall be representative samples of the waste and shall be collected following the procedure indicated by the selected laboratory performing the TCLP analysis. TCLP samples shall be collected by the SI IH.

Attachment 2

Limits on Employee Exposure and Environmental Contamination

1. Employee exposures to lead shall not exceed the OSHA Permissible Exposure Limit of 50 micrograms of lead per cubic meter of air ($\mu\text{g}/\text{M}^3$) as an 8-hour time-weighted average (TWA) concentration, for Smithsonian employees who might contact lead dust in the normal course of work. It is the goal of the Smithsonian program to control any potential exposure to less than the OSHA Action Level of 30 $\mu\text{g}/\text{M}^3$ (8-hour TWA).
2. The maximum allowable concentration of lead in drinking water is 15 parts per billion, for water systems for 90 percentile, in accordance with the Safe Drinking Water Act , (Title 42 of the United States Code), and the National Primary Drinking Water Regulations found in 40 CFR 141.80.
3. Dust wipe clearance levels, for evaluating post abatement clean-up in housing and child-occupied facilities, and abatement in any other locations specifically for hazard reduction, shall meet the following EPA/HUD requirements:
 - (a) Bare and Carpeted floors: Less than or equal to 40 μg lead per square foot of area,
 - (b) Interior window sills: Less than or equal to 250 μg lead per square foot of area, and
 - (c) Window troughs: Less than or equal to 400 μg lead per square foot of area.
 - (d) Exterior horizontal surfaces: Less than or equal to 400 μg lead per square foot of area.
4. Dust wipe clearance levels, for evaluating clean-up in general construction and renovation projects (not conducted for hazard reduction), shall not exceed the pre-abatement baseline dust-wipe results. Criteria to determine acceptable pre-abatement baselines shall follow the SI Lead-Based Paint Abatement Specifications.
5. Soil (bare) concentrations shall meet the following the EPA/HUD requirements:
 - (a) 400 parts per million (ppm) for bare soil associated with a SI-owned housing or child-occupied facilities where there is child contact (e.g., play area).
 - (b) 1,200 ppm for other areas of bare soil around SI-owned housing where there is minimal child contact (e.g., dripline)

Attachment 3

OSHA Compliance Plan - Lead Abatement, Renovation, and Maintenance Jobs

(to meet requirements of 29 CFR 1926.62)

FACILITY/DEPARTMENT:

Date Reviewed _____ (required by OSHA every 6 mos.) Signature

List all expected abatement or repair tasks that involve lead or lead-based paint:

Task No.	Describe Task	Authorized Staff / LBP Supervisor	Training Rec'd., incl. Respirator
	(Edit these examples:) Replacement of _____ Paint removal on _____ Encapsulation of _____ Paint film stabilization of _____ Friction surface treatment of _____ Impact surface treatment of _____ Dust removal/custodial _____		

List work procedures and exposure controls (incl. ppe and equipment):

Task No.	Describe work practice and exposure controls, or attach NIBS O&M Guidelines.

Air Monitoring Data

Task No.	Describe representative personal sampling data (add wipes, bulks, or clearances if appropriate. Reference memos.

REQUIRED BY DISTRICT OF COLUMBIA

List each LBP activity, date, amount removed:
