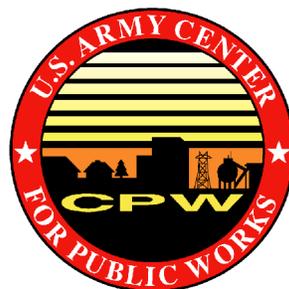


PUBLIC WORKS TECHNICAL BULLETIN

420-70-2

20 FEBRUARY 1997

INSTALLATION LEAD HAZARD MANAGEMENT



Public Works Technical Bulletins (PWTBs) are published by the U.S. Army Center for Public Works, Alexandria, VA. They are intended to provide information on specific topics in areas of Facilities Engineering and Public Works. They are not intended to establish new Department of the Army (DA) Policy.

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FACILITIES ENGINEERING
Buildings and Structures

INSTALLATION LEAD HAZARD MANAGEMENT

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Glossary

Chapter 1 Introduction

1-1. Purpose. This U.S. Army Center for Public Works Technical Bulletin (PWTB)--

a. Provides technical guidance to identify and control lead hazards from lead-contaminated paint, dust, and soil, and from other sources in Army owned or leased target housing and child-occupied facilities constructed prior to 1978, or as required by final governing standards.

b. Supplements technical guidance contained in Memorandum, Office of the Assistant Secretary of the Army, (Installations, Logistics, and Environment) Subject: Lead-Based Paint Policy Guidance, 28 April 1993.

c. Supplements technical guidance contained in Memorandum, Assistant Chief of Staff for Installation Management (ACSIM), DAIM-FDF-B, Subject: Policy Guidance - Lead-Based Paint and Asbestos in Army Properties Affected by Base Realignment and Closure, 5 November 1993.

1-2. Applicability. This PWTB applies to installation Directorates of Public Works, Directorates of Engineering and Housing, or other engineering activities that operate and maintain Active and Reserve Army facilities.

1-3. Objectives. The objectives of this PWTB are to--

a. Provide technical guidance to perform installation lead hazard management through a program which stresses risk assessment, on-going monitoring, interim controls, and abatement, as prescribed by AR 40-5, AR 200-1, AR 210-50, AR 420-70, and AR 608-10.

b. Assist installations to--

(1) Comply with applicable Army, Federal, state, and local regulations.

(2) Identify, control, and abate sources of lead and lead hazards.

c. Educate personnel about lead hazards and methods of control.

d. Provide technical guidance on protection of children from lead exposure.

e. Provide technical guidance to protect workers from overexposure to lead.

1-4. References. Required and related publications are listed in appendix A.

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1-5. Explanation of abbreviations and terms. The glossary contains the abbreviations and terms used in this PWTB.

1-6. Points of contact for policy and technical assistance

a. For **POLICY** assistance, contact the office of:

(1) Assistant Chief of Staff for Installation Management, Facilities and Housing Directorate, ATTN: DAIM-FDF-B, (703) 428-6176 or DSN 328-6176, E-mail nixbj@pentagon-acsim3.army.mil.

(2) Assistant Chief of Staff for Installation Management, Environmental Programs Directorate, ATTN: DAIM-ED-C, (703) 693-0545 or DSN.223-0545, E-mail kraft@pentagon-acsim1.army.mil.

(3) U.S. Army Center for Health Promotion and Preventive Medicine, Industrial Hygiene Field Services Program, ATTN: MCMH-DC-OFS, (410) 671-3118 or DSN 584-3118, E-mail victoria_belfit@chppm-ccmail.apgea.army.mil.

b. For **TECHNICAL** assistance, contact:

(1) Major Army command (MACOM):

(a) U.S. Army Forces Command (FORSCOM), ATTN: AFPI-ENE, (404) 669-7513, E-mail Jacksonc@ftmcpshn-emhl.army.mil.

(b) U.S. Army Training and Doctrine Command (TRADOC), ATTN: ATOB-GF, (804) 727-3678, E-mail richardw@emh10.monroe.army.mil.

(c) U.S. Army Materiel Command (AMC), ATTN: AMCEN-F, (703) 617-8122 or DSN 767-8122, E-mail cfoster@hqamc.army.mil.

(d) U.S. Army Military District of Washington (MDW), ATTN: ANEN-IS, (202) 685-2920 or DSN 325-2920, E-mail tarnopolj@mcnair-emh2.army.mil.

(e) U.S. Army Medical Command (MEDCOM), ATTN: MCFA-D, (210-221-6441 or DSN 471-6441, E-mail gilbert_gonzalez@smtplink.medcom.amedd.army.mil.

(f) U.S. Army Reserve Command (USAR), ATTN: DCS-EN, (404) 629-8223, E-mail munsonmi@mindspring.com.

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(g) U.S. Army Europe and 7th Army (USAREUR), ATTN: AEAEN-ENVR, DSN 370-7699. E-mail nicholls@dcsengr.hqusareur.army.mil.

(h) U.S. Army Pacific Command (USARPAC), ATTN: APEN-E, (808) 438-9763, E-mail busdquetk@shafter-emh3.army.mil.

(i) U.S. Headquarters Forces Korea and Eighth U.S. Army (EUSA), ATTN: FKEN-E, 011-822-7913-5049, E-mail fken-epo@emh6.korea.army.mil.

(2) U.S. Army Corps of Engineers, Center for Public Works (CECPW), ATTN: CECPW-EB, (703) 806-5979 or DSN 656-5979, E-mail fidel.j.rodriguez@cpw01.usace.army.mil and/or (703) 806-5025 or DSN 656-5025, E-mail charles.w.racine@cpw01.usace.army.mil.

(3) U.S. Army Environmental Center, ATTN: SFIM-AEC-ECC, (410) 612-7076 or DSN 584-7076, E-mail mcworsha@aec.apgea.army.mil.

(4) U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM), Industrial Hygiene Field Services, ATTN: MCHB-DC-OFS, (410) 671-3118 or DSN 584-3118, E-mail victoria_belfit@chppm-ccmail.apgea.army.mil.

(5) Chief of Staff, U.S. Army Safety Office, ATTN: DACS-SF, (703) 695-7291 or DSN 225-7291, E-mail gibsonja@pentagon-hqdadss.army.mil.

(6) U.S. Army Corps of Engineers, Safety Office, Industrial, ATTN: CESO-I, (202) 761-8566 or DSN 763-8566, E-mail robert.e.stout@usace.army.mil.

Chapter 2

Lead Hazard Management Strategy

2-1. Lead hazard management program. The installation lead hazard management program must --

- a. Comply with Federal, state, and local lead-based paint (LBP) regulations. Army policy is to follow the more stringent regulation.
- b. Comply with requirements in accordance with guidance issued by MACOMs and consistent with Final Governing Standards (overseas installations only).
- c. Establish an installation lead hazard management team.
- d. Ensure communication between members of the installation lead hazard management team and residents, tenants, and workers.
- e. Focus on reducing lead exposure by --
 - (1) Managing the source of lead. For example:
 - (a) Lead-contaminated paint and lead-containing materials in vinyl miniblinds. (Refer to appendix B.)
 - (b) LBP on playground equipment. (Refer to appendix C.)
 - (2) Controlling the pathway (i.e., household dust and soil).
 - (3) Educating the affected population (i.e., children, parents, and workers).

2-2. Lead hazard management strategy. It is an Army requirement to provide a lead hazard-free living and working environment for soldiers and their families. To this end, an effective program will --

- a. Be based on criteria that measure the condition of facilities and not on criteria that measure the health of occupants.
- b. Provide occupants of target housing and child-occupied facilities with a safe and healthful environment free of lead hazards.
- c. Identify and manage in-place lead hazards associated with lead-contaminated paint.

- d. Identify and abate lead-contaminated dust.
- e. Identify and manage in place or abate lead-contaminated soil.
- f. Identify and dispose of all lead-contaminated solid waste per applicable Federal, state, and local regulations.
- g. Dispose of facilities painted with lead-contaminated paint in a cost effective manner as required by applicable Federal, state, and local regulations.

2-3. Medical policy guidance. The Childhood Lead Poisoning Prevention (CLLP) Program on each installation consists of a multi-disciplinary core of experts who develop an overall program of lead risk reduction. Program elements include a child blood screening program; lead exposure risk questionnaires; clinically indicated screening; elevated blood lead (EBL) case management; and outreach, education, and training. Refer to AR 40-5 for additional guidance.

2-4. Environmental policy guidance. Environmental policy includes--

- a. Characterization of solid waste resulting from demolition of a facility or removal of individual architectural components in compliance with Federal, state, or local regulations. The U.S. Army Environmental Hygiene Agency (AEHA) CHPPM has developed a protocol on waste characterization for demolition of buildings as a single waste stream. This protocol should be followed and coordinated with prevailing state and local requirements.
- b. Environmental compliance requirements for handling, storage, management, and disposal of solid waste as described in AR 200-1.
- c. Management of lead-contaminated soil in place, unless economic, operational, or regulatory requirements dictate removal and disposal.
- d. Environmental Program Requirement (EPR) Report used to plan, program, budget, and forecast costs to manage the environment, to practice good environmental stewardship, and to attain and maintain compliance with existing Federal, state, and local environmental laws and regulations.

2-5. American Society for Testing and Materials guidelines for lead hazards. The American Society for Testing and Materials (ASTM) Sub-committee EO6.23, Abatement of Lead Hazards in Buildings was established by the U.S. Department of Housing and Urban Development (HUD) in 1991 to develop consensus guidelines for abating and mitigating lead hazards in and around buildings. The sub-committee has developed and continues to develop guidelines and standards to be used in dealing with lead hazards associated with paint, dust, airborne particulates,

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and soil. ASTM consensus standards and guidelines include:

a. Management of lead hazards

(1) PS 81, Standard Guide for Identification and Management of Lead Hazards in Facilities.

(2) E 1605, Standard Terminology Relating to Abatement of Hazards From Lead-Based Paint on Buildings and Related Structures.

b. Collection of field samples. Field samples will be collected following ASTM standards listed below.

(1) Air Particulates: E 1553, Standard Practice for the Collection of Airborne Particulate Lead During Abatement and Construction Activities.

(2) Soil: E 1727, Standard Practice for Field Collection of Soil Samples for Lead Determination by Atomic Spectrometry Techniques.

(3) Dust Wipe: E 1728, Standard Practice for Field Collection of Settled Dust Samples Using Wipe Sampling Methods for Lead Determination by Atomic Spectrometry Techniques.

(4) Paint Film: E 1729, Standard Practice for Field Collection of Dried Paint Samples for Lead Determination by Atomic Spectrometry Techniques.

(5) Dust (DVM): PS 46, Provisional Standard Practice for the Collection of Surface Dust by Air Sampling Pump Vacuum Technique for Subsequent Lead Determination.

(6) Dust Wipe Specification: E 1792, Standard Specification for Wipe Sampling Materials for Lead in Surface Dust.

c. Preparation of samples for analysis. Samples will be prepared for analysis following ASTM standards listed below.

(1) Dust Wipe: E 1644, Standard Practice for Hot Plate Digestion of Dust Wipe Samples for the Determination of Lead by Atomic Spectrometry.

(2) Paint Film: E 1645, Standard Practice for the Preparation of Dried Paint Samples for Subsequent Lead Analysis by Atomic Spectrometry.

(3) Soil: E 1726, Standard Practice for Sample Digestion of Soils for the Determination of Lead by Atomic Spectrometry.

(4) Air Particulate: E 1741, Standard Practice for Preparation of Airborne Particulate Lead Samples Collected During Abatement and Construction Activities for Subsequent Analysis by Atomic Spectrometry.

d. Sample analysis (FAA, ICP, GFAA). Samples will be analyzed following ASTM standard E 1613, Standard Test Method for Analysis of Digested Samples for Lead by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES), Flame Atomic Absorption (FAAS) or Graphite Furnace Atomic Absorption (GFAAS) Techniques.

e. Encapsulation. The following ASTM Standards apply to the selection and use of encapsulants.

(1) Non-reinforced liquid encapsulant specification: E 1795, Standard Specification for Non-Reinforced Liquid Coating Encapsulation Products for Leaded Paint in Buildings.

(2) Encapsulant selection and use: E 1796, Standard Guide for the Selection and Use of Liquid Coating Encapsulation Products for Leaded Paint in Buildings.

(3) Reinforced liquid encapsulant specification: E 1797, Standard Specification for Reinforced Liquid Coating Encapsulation Products for Leaded Paint in Buildings.

f. Field assessments. Field assessments will be conducted following ASTM standards listed below.

(1) Use of spot test kits for detecting lead in paint: E 1753, Standard Practice for the Use of Qualitative Chemical Spot Test Kits for Detection of Lead in Paint Films.

(2) Evaluating performance of on-site extraction and electrochemical and spectrophotometric analysis: E 1775, Standard Guide for Evaluating Performance of On-site Extraction and Field-Portable Electrochemical for Spectrophotometric Analysis for Lead.

(3) Evaluating performance of spot test kits for paint: E 1828, Standard Guide for Evaluating the Performance Characteristics of Qualitative Chemical Spot Test Kits for Lead in Paint.

g. Quality assurance and safety.

(1) Evaluating traditional laboratories: E 1583, Practice for Evaluating Laboratories

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Engaged in the Determination of Lead in Paint, Dust, Airborne Particulates, and Soil Taken From and in and Around Buildings and Related Structures.

(2) Quality systems for organizations engaged in field assessments: PS 45, Provisional Standard Practice for Evaluating Quality Systems of Organizations Engaged in Conducting Facility and Hazard Assessments to Determine the Presence and Extent of Lead in Paint, Dust, Airborne Particulate, and Soil in and Around Buildings and Related Structures.

2-6. Review checklist. The review checklist provided at appendix D is intended to assist an installation to evaluate the effectiveness of its lead hazard management program. This checklist is similar to the Installation Status Report (ISR) and suggests quality condition indices of “Green,” “Amber,” and “Red.”

Chapter 3 Implementation of the Installation Lead Hazard Management Program

3-1. Implementation. This chapter provides technical guidance to implement an installation lead hazard management program. The process is listed in table 3-1 shown below. Required actions are explained in paragraph 3-2.

Table 3-1. Installation Lead Hazard Management Process and Actions

Steps	Action
1	Establish an installation lead hazard management team.
2	Understand key terms and regulatory requirements of lead hazard management.
3	Develop an installation lead hazard management plan.
4	Train personnel involved in lead hazard management activities.
5	Develop and implement a lead hazard public awareness program.
6	Conduct medical screening and testing for lead in children and workers.
7	Identify facilities for disposal.
8	Perform risk assessments and EBL investigations of target housing and child-occupied facilities.
9	Identify lead hazards in paint, dust, and soil.
10	Determine and implement interim controls and abatement actions.
11	Conduct clearance inspections.
12	Conduct ongoing monitoring.

3-2. Process. Identification and management of lead hazards in paint, dust, and soil consist of conducting risk assessments and taking actions to manage in place or abate lead hazards and their sources. The steps outlined below are keyed to Table 3-1 and Figure 3-1.

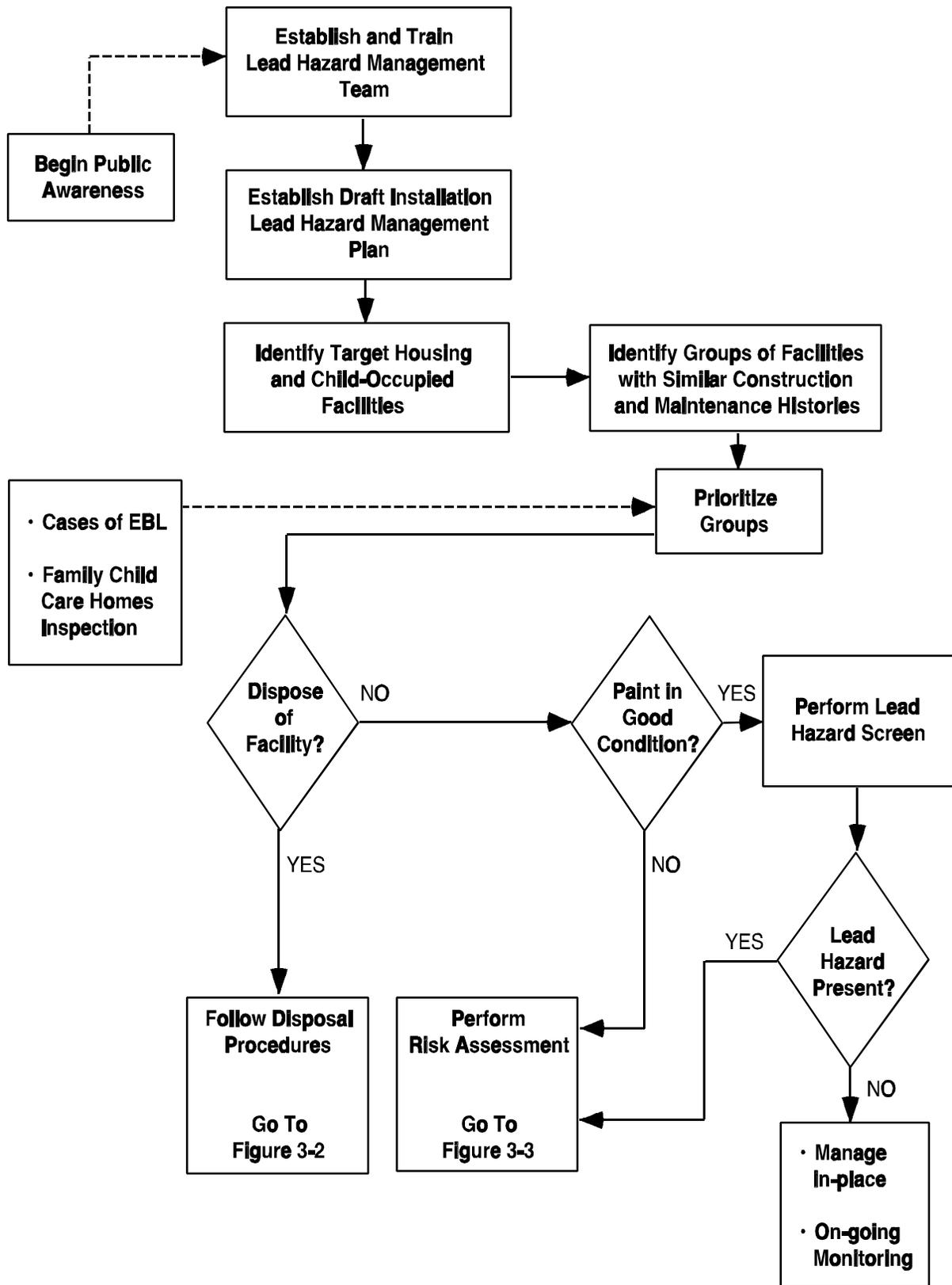


Figure 3-1. Lead Hazard Management for Pre-1978 Target Housing and Child-Occupied Facilities

a. **Step 1 - Establish an installation lead hazard management team.** The most effective way for an installation commander to comply with Federal, state, and local lead-based paint regulations is to appoint a Lead Hazard Management coordinator and establish an installation lead hazard management team. The team can be established as a standing installation team, an ad hoc or process action team, a subcommittee of the Installation Environmental Quality Control Committee, or any other method determined by the installation commander.

(1) The team will develop the installation lead hazard management plan including project documentation and programming for funds.

(2) The team will develop public awareness and worker education programs to communicate the risks associated with exposure to lead hazards, ways to prevent or control exposures, and corrective actions to prevent, manage, and abate hazards.

(3) Team membership should include representatives from command, engineering, environmental, housing, medical, safety, legal, and public affairs. Membership can also include housing, community health, child development, contracting, labor union, community services, and Corps of Engineers representatives. The Women, Infant, and Children coordinator can make significant contributions in public awareness.

b. **Step 2 - Understand key terms and regulatory requirements of lead hazard management.** Key terms and procedures of lead hazard management are explained in the glossary. Army, Federal, state and local requirements must be reviewed and understood by team members. Additional supporting documentation related to the lead hazard management program is listed in appendix E .

c. **Step 3 - Develop an installation lead hazard management plan.** Develop and document a lead hazard management plan to identify and control exposures to lead hazards from lead-contaminated paint, dust, and soil.

(1) The lead hazard management plan must be integrated with other installation programs, such as environmental compliance, Base Realignment and Closure (BRAC), Whole-Neighborhood Revitalization, and the EPR Report.

(2) Lead hazard management activities must be carefully planned and documented to ensure regulatory compliance and to provide a historical record for legal liability and future project planning.

(3) Elements of the plan, maintained by the appropriate lead hazard management team member, include--

- (a) Identification and prioritization of target housing and child-occupied facilities.
- (b) Summaries of construction and maintenance histories taken from real property records, contract documents, and other local sources.
- (c) Summaries of child and worker blood lead level screening and testing data.
- (d) Identification of similar groupings of facilities for risk assessment and interim controls. (See HUD Guidelines, Chapter 5.)
- (e) Results of previous paint inspections.
- (f) Results of risk assessments identifying lead hazards.
- (g) Recommended interim controls and abatement actions based on results of risk assessments.
- (h) Records of actions taken for children with EBLs.
- (i) Records of training and certification of personnel involved in LBP activities.
- (j) Medical surveillance records of personnel involved in LBP activities.
- (k) Results of clearance and on-going monitoring inspections showing recommended changes to interim control procedures and abatement plans.
- (l) Abatement project lists, including Whole-Neighborhood Revitalization and other major repair projects.
- (m) Records of solid waste characterization and disposal actions.
- (n) Copies of contract documents/reports specifically cited in the lead management plan.
- (o) Identification of sources of funding and planning, programming, budgeting, and execution plans.
- (p) Lists of projects submitted to higher headquarters through the EPR Report.

d. Step 4 - Train personnel involved in lead-hazard management activities.

(1) Training which complies with U.S. Environmental Protection Agency (EPA), State, and local requirements will be provided for all personnel involved with lead hazard management activities. Lead hazard and health training services are defined in 40 Code of Federal Regulations (CFR) Part 745, Subpart L.

(2) Individuals conducting hazard management activities in target housing and child-occupied facilities will be properly trained and certified. Training programs will be accredited by EPA.

(3) Training activities for personnel involved in lead hazard management are contained in appendix F.

e. Step 5 - Develop and implement a lead hazard public awareness program.

Community awareness is the process by which the installation lead hazard management team communicates the health effects and known or suspected extent of lead hazards. It includes providing information concerning actions planned or taken and encourages feedback to the team. The process educates the community about the health effects of lead, the pathways of exposure, sources for additional information, and supporting actions, such as well-baby checkups and housekeeping practices. Public law requires the disclosure of known lead-based paint and/or lead-based paint hazards to new occupants of family housing. (See appendix G.)

(1) Occupants will be notified at the time of assignment to quarters concerning the known presence of lead-based paint and/or lead-based paint hazards, and precautions they can take to protect their children from lead poisoning.

(2) Occupants will be notified of the results of risk assessments and actions planned to implement interim controls or abatement.

(3) Occupants with young children must receive information on protecting their children from lead poisoning. The importance of wet mopping or wet wiping with detergent to control lead dust levels and of washing children's hands must be stressed.

f. Step 6 - Conduct medical screening and testing for lead in children and workers.

Medical screening of all military family members under the age of six years shall be conducted in accordance with the procedures and guidelines set forth in Memorandum, Office of the Surgeon General, DASG-PSG, subject: Childhood Lead Poisoning Prevention, dated 26 May 1993. Medical surveillance programs for workers exposed to lead are outlined in:

(1) Occupational Safety and Health Administration (OSHA), 29 CFR Part 1910.1025, Lead Standard for Non-Construction Activities Such as Routine Maintenance.

(2) OSHA, 29 CFR Part 1926.62, Lead Exposure in Construction; Interim Final Rule.

(3) HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing.

g. Step 7 - Identify facilities for disposal

(1) When target housing is disposed of by sale, transfer, or demolition, public law requires that certain actions must be performed. (See figure 3-2.) When facilities containing LBP are demolished, demolition debris will be characterized and disposed of in accordance with Federal, state, and local solid waste management regulations.

(2) HUD, 24 CFR Subtitle A, Part 35, Lead-Based Paint Poisoning Prevention in Certain Residential Structures, Subpart E, Elimination of Lead-Based Paint Hazards in Federally-Owned Properties Prior to Sale for Residential Habitation, implements Section 302 of the Lead-Based Paint Poisoning Prevention Act (Title X PL 102-550). This regulation requires that prior to occupancy of property constructed before 1978, where its use subsequent to sale is intended for residential habitation, the federal agency selling the property shall ensure that the following steps are taken:

(a) All surfaces will be inspected to determine whether defective paint exists. Assume that these defective surfaces are lead-based paint hazards. (It may be cost effective to test defective surfaces to confirm the presence of lead-based Paint.)

(b) Defective paint surfaces will be treated to eliminate lead hazards by covering or removing of defective paint.

(c) Disclosure requirements of 24 CFR Part 35 Subpart E have been superseded by the HUD/EPA joint final disclosure rule. (See appendix G.)

(3) Implementation of Section 1013, Disposition of Federally-Owned Housing, of Title X (PL 102-550) will apply to the disposition (sale) of pre-1978 Army target housing, and will:

(a) Require hazard evaluation and abatement of LBP hazards in certain pre-1978 housing. Hazard evaluation includes paint inspections and risk assessments.

(b) Allow waiver of requirements for certain pre-1978 housing.

(c) Establish required practices for occupant protection and worksite preparation, monitoring, and control of hazards.

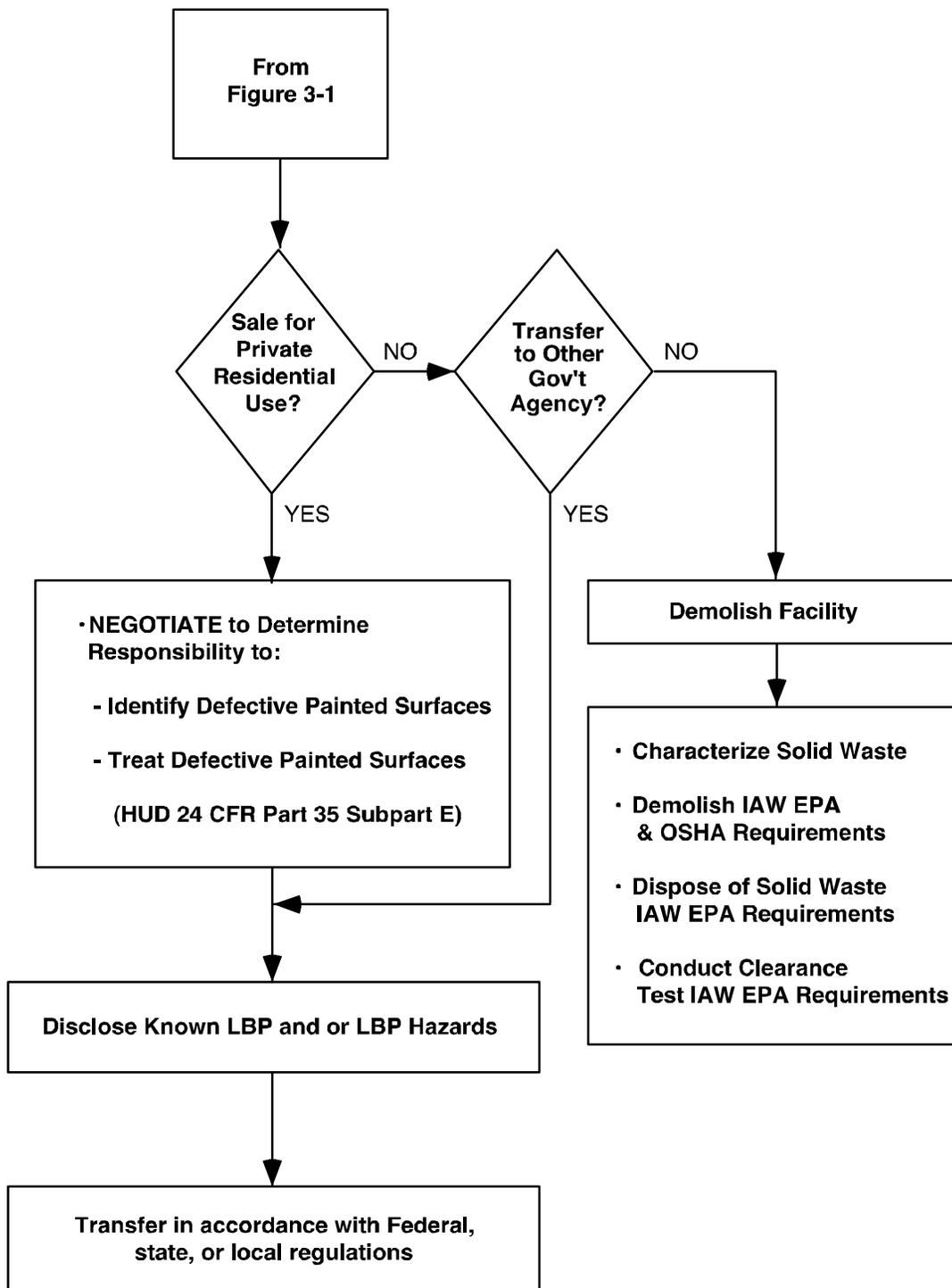


Figure 3-2. Disposal of Pre-1978 Target Housing

h. Step 8 - Perform risk assessments and EBL investigations of target housing and child-occupied facilities. Risk assessments will be performed to identify, document, and develop a plan for the control or elimination of lead hazards in target housing and child-occupied facilities.

(1) The Army has adopted, as the minimum standard of care, the procedures for performance of EBL investigations found in the HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, Chapter 16. If and when a consensus standard procedure is adopted for the EBL investigation, it shall take precedence over the HUD procedure.

(2) The Army has adopted, as the minimum standard of care, the procedures for performance of risk assessments found in the HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, Chapter 5.

(3) The elements of a risk assessment include--

(a) Gathering of information regarding the age and maintenance history of the facility, the likelihood of occupancy by children under age 6, and known findings of EBL levels in children.

(b) Identification of the presence of lead hazards through a combination of visual inspections and paint, dust, and soil analysis using limited numbers of samples and soil environmental sampling techniques. Refer to HUD Guidelines, Chapter 5, Table 5.3 for condition categories (Intact, Fair, Poor) of painted surfaces.

(c) Provision of a report identifying lead hazards and establishing a lead hazard management plan for future actions ranging from interim controls to full abatement.

(d) Identification of past maintenance practices that need to be changed to prevent creation of future lead hazards.

(e) Recommended schedules for ongoing monitoring.

(f) Community and worker education plans.

(4) Types of risk assessments include lead hazard screens and risk assessments. Selection of the type of risk assessment to be used is based on the age of facilities, occupancy, and the condition of painted surfaces.

(a) Lead hazard screens. A lead-hazard screen is performed only in facilities which have substrates and painted surfaces that are in good (intact) condition with no significant deterioration. Lead hazard screens rely on limited sampling and more sensitive hazard

identification criteria to avoid the higher costs of risk assessment. Lead hazard screenings do not include collection of soil samples.

(b) Risk assessments. These assessments (see figure 3-3) are performed in facilities which contain paints and substrates in fair or poor condition that could result in lead exposure and adverse health effects to humans.

(5) When conducting a risk assessment, a sampling strategy for groupings of facilities with similar construction and maintenance histories must be selected. The presence, nature, and extent of lead hazards can be characterized by using either targeted, worst-case, or random sampling techniques. The selection of the type of sampling strategy to be used is based on the desired degree of confidence and on economic factors which consider the number of samples required and the availability of historical maintenance information. (See figure 3-3.)

(a) Targeted sampling. Targeted sampling uses existing historical maintenance records to select facilities that are most likely to contain lead hazards. The results of targeted sampling should adequately identify the lead hazards that may exist in other facilities in the sample population but the degree of certainty associated with the findings is not quantifiable. The cost of targeted sampling is less than worst-case and random sampling.

(b) Worst-case sampling. Worst-case sampling is used when historical maintenance records are incomplete and is based on a visual walk through of all facilities to identify those that are most likely to contain lead hazards. The number of facilities sampled and the reliability of the results obtained are similar to those of targeted sampling, except the sampling cost is increased due to visual walk through inspections.

(c) Random sampling. Random sampling provides a significant degree of confidence about the existence of lead hazards and is based on statistical methods. Random sampling in groupings of twenty or more similar facilities will increase the cost of the risk assessment compared to targeted or worst-case sampling.

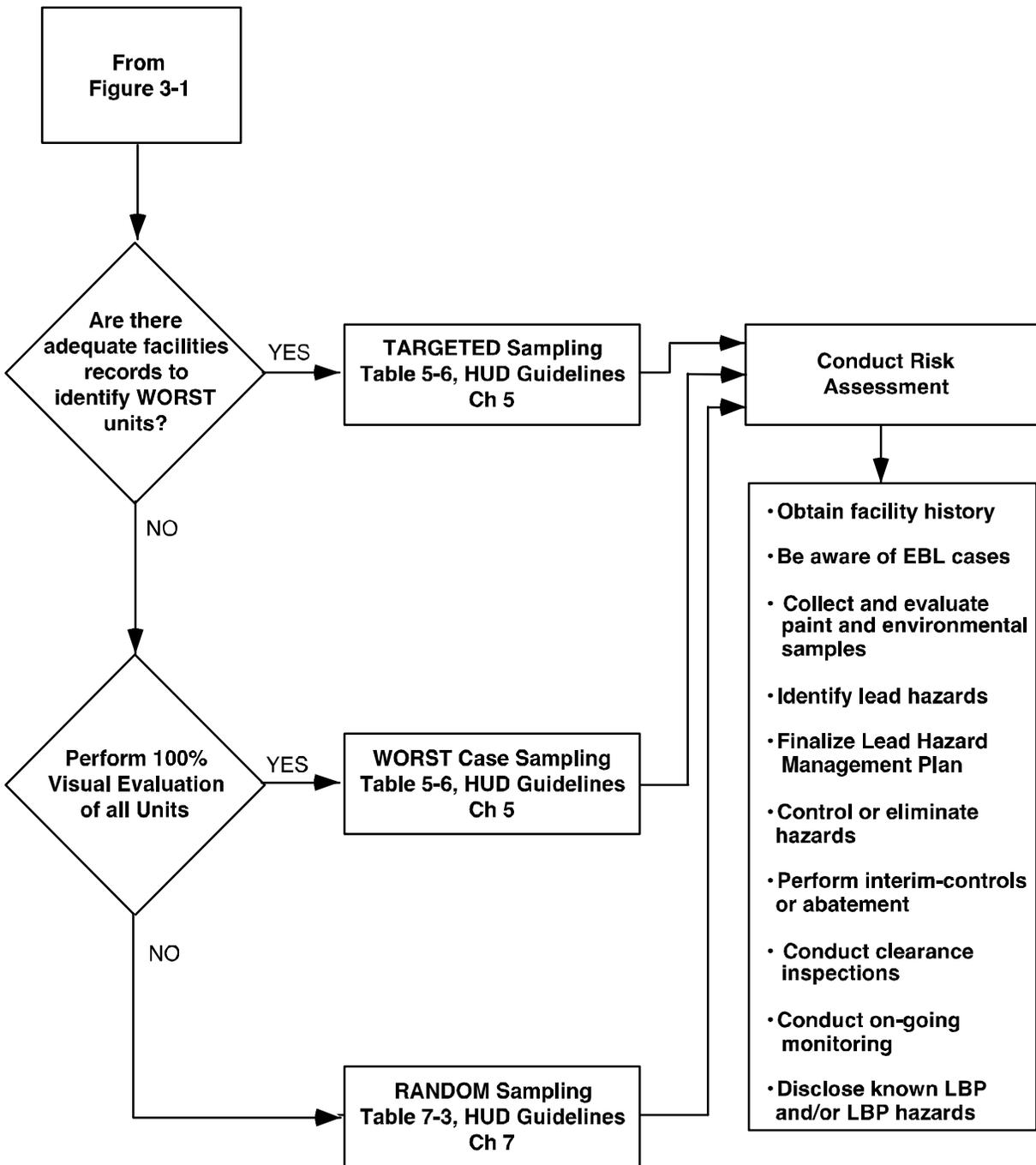


Figure 3-3. Risk Assessment for Pre-1978 Target Housing and Child-Occupied Facilities

i. **Step 9 - Identify lead hazards in paint, dust, and soil.** Determination of the existence of lead hazards in paint, dust, and soil is explained in HUD Guidelines, Chapter 5.

j. **Step 10 - Determine and implement interim controls and abatement actions.** The preferred method for controlling lead hazards and their sources is interim control. Interim control is designed to reduce human exposure or likely exposure to lead hazards. The objective of interim control is to protect occupants from lead exposure in facilities pending total removal of lead-contaminated paint. Where interim controls are not effective in controlling lead hazards, the source of the lead hazard must be abated. Abatement will only occur when interim controls are ineffective or when economically justified.

(1) The fundamental objective of all interim control strategies is to protect children from exposure to lead-contaminated paint chips and lead-contaminated dust. In most cases, the most significant sources of lead-contaminated dust are--

(a) Lead-contaminated paint which is not intact (chalking, chipping, peeling, or flaking), including deteriorated paint on friction and accessible surfaces.

(b) Exposed soil with high levels of lead contamination.

(2) Interim control strategies are normally instituted subsequent to risk assessments and should continue until the removal of lead hazards and the sources of lead hazards. Interim controls are intended to keep facilities lead-safe and include any measure designed to control exposure to lead hazards and their sources. Interim controls include--

(a) Dust removal.

(b) Treatment of defective lead contaminated paints.

(c) Treating bare, lead-contaminated soil.

(d) Educating residents and training workers.

(e) Conducting scheduled ongoing monitoring.

(3) Information on lead hazards, proposed method of abatement, specific worker protection requirements, and methods for cleaning and clearance will be included in the lead hazard management plan. The Army has a contract for LBP abatement for installations in the continental United States.

(4) Interim controls meet different needs in three general situations.

(a) Interim controls treat damaged lead-contaminated paint, lead-contaminated dust, and lead in soil in hazards identified through the course of risk assessments.

(b) Interim controls prevent deterioration of lead contaminated paint from creating health risks in the future.

(c) Interim controls institute precautions to avoid inadvertently disturbing lead-contaminated paint or otherwise creating lead-contaminated dust or soil hazards in the course of other maintenance, repair, or revitalization work.

(d) Interim controls include a rigorous clean-up at the conclusion of projects which disturb lead-contaminated paint. Clean-up and clearance procedures will be performed in accordance with HUD Guidelines, Chapter 14.

(5) Major repairs or Whole-Neighborhood Revitalization projects will include abatement of all existing lead-based paint hazards and lead-contaminated paint on surfaces disturbed by the work.

(6) Worker protection must be stressed and assured for all lead hazard management activities that disturb lead-contaminated paint in accordance with OSHA 29 CFR 1910.1025 and OSHA 29 CFR 1926.62.

(a) Activities will be conducted according to reliable, effective, and safe work practice standards such as the "Operations and Maintenance Work Practices Manual for Homes and Buildings", available from the National Institute of Building Sciences (NIBS), 1201 L Street N.W., Suite 400, Washington, D.C. 20005-4014, telephone (202) 289-7800, FAX (202) 289-1092.

(b) Great care must be exercised to protect workers from excess lead exposures and to prevent them from taking lead dust home on their clothing or belongings which could then poison their children.

(7) Interim controls and abatement methods for LBP are found in HUD Guidelines, Chapters 11 and 12. Examples include--

(a) Planting grass, sod, hedges, etc., on bare, lead-contaminated soil.

(b) Covering bare, lead-contaminated soil by paving or spreading mulch.

(c) Removal of lead-based paint by chemical or mechanical means.

(d) Enclosure or covering of lead-based paints with a permanent surface.

(e) Encapsulation. Encapsulation of friction, impact, and chewable surfaces is to be discouraged because of the high probability of those surfaces being damaged in the future.

(f) Replacement of components.

(g) Replacement of bare, lead-contaminated soil. This method is recommended only as a last resort. Disposal costs for solid waste generated by removal may be prohibitive.

k. **Step 11 - Conduct clearance inspections.** Clearance inspections (see HUD Guidelines, Chapter 15) involve the collection and laboratory analysis of samples to quantitatively determine the amount of lead in dust and soil upon completion of abatement work or interim control activities which disturb lead-contaminated paint.

(1) Clearance inspections must be conducted prior to release of the contractor or re-occupancy of the facility. Visual inspection to determine proper clean-up of work sites will be conducted prior to performing clearance inspections.

(2) Allowable levels of lead in paint, dust, and soil are established by EPA and are listed in appendix H.

l. **Step 12 - Conduct ongoing monitoring.**

(1) Ongoing monitoring is required in all target housing and child-occupied facilities where lead-contaminated paint is known or suspected to be present, regardless of the paint's present condition. Ongoing monitoring is performed for previously identified and managed or abated lead hazards and determines if interim control measures have been effective or if new hazards have developed. On-going monitoring includes a report of findings and recommendations.

(2) The Army has adopted, as the minimum standard of care, the procedures for performance of ongoing monitoring in HUD Guidelines, Chapter 6.

(3) Ongoing monitoring must be conducted until all sources of lead hazards are abated.

(4) Between occupancy, target housing should be reinspected --

(a) To verify that previously controlled or abated lead hazards have not recurred.

(b) To identify the occurrence and extent of new lead hazards.

(c) To notify occupants that there is damage to painted surfaces.

3-3. Documented procedures needed for lead hazard management activities. To manage lead and lead hazards, it is essential to have, and follow, documented procedures. Some or all lead hazard management activities may be performed under contract and must meet quality system and competency requirements that provide a minimum and definable standard of practice based on national consensus standards.

a. Management of lead hazards involves planning, interim control, and abatement activities based on data obtained from the initial risk assessment. Assessment will determine paint condition, the presence of lead-contaminated dust and soil above the HUD action levels.

b. Sampling and analysis are essential to obtaining the information needed in making decisions in support of the installation lead hazard management program. Title X has directed the EPA to establish a program for accrediting laboratories used in providing data associated with LBP. In response to this directive the EPA has established the National Lead Laboratory Accreditation Program (NLLAP). The only laboratories acceptable to use in providing data for lead hazard management activities are NLLAP recognized laboratories. The NLLAP accreditation is granted on a matrix specific basis, that is the laboratory is accredited for each type of sample matrix (i.e., paint chips, dust wipes, soil). The standard of care: **ONLY USE NLLAP ACCREDITED LABORATORIES**, accredited for the matrices of interest. (See HUD Guidelines, Chapter 3.)

FOR THE DIRECTOR:

FRANK J. SCHMID, P.E.
Director of Engineering

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Appendix A References

Section I Required publications

AR 40-5
Preventive Medicine. (Cited in paras 1-3a and 2-3.)

AR 200-1
Environmental Protection and Enhancement. (Cited in paras 1-3a and 2-4b.)

AR 210-50
Housing Management. (Cited in para 1-3a.)

AR 420-70
Buildings and Structures. (Cited in para 1-3a.)

AR 608-10
Child Development Services (Cited in para 1-3a.)

Section II Related publications

Memorandum, Office of the Assistant Secretary of the Army (Installations, Logistics, and Environment), subject: Lead-Based Paint Policy Guidance, 28 April 1993. (Cited in para 1-1b.)

Memorandum, Headquarters, Department of the Army, Office of the Assistant Chief of Staff for Installation Management, DAIM-FDF-B, subject: Policy Guidance - Lead-Based Paint and Asbestos in Army Properties Affected by Base Realignment and Closure, 5 November 1993. (Cited in para 1-1c.)

Memorandum, Office of the Surgeon General, SGPS-PSP, subject: Childhood Lead Poisoning Prevention, 26 May 1993. (Cited in para 3-2f.)

Department of Housing and Urban Development, Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, June 1995. (This publication may be obtained from Director, Office of Lead-Based Paint Abatement and Poisoning Prevention, U.S. Department of Housing and Urban Development, 451 Seventh Street SW., Room B-133, Washington, D.C. 20410, telephone 1-800-245-2691.) (Cited in paras 3-2c, 3-2f, 3-2h, 3-2i, 3-2j, 3-2k, and 3-2l.)

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Housing and Community Development Act of 1992 (PL 102-550), 28 October 1992, Title X, Residential Lead-Based Paint hazard Reduction Act of 1992. (Cited in para 3-2g.)

40 CFR Part 745 Subpart L, Lead; Requirements for Lead-Based Paint Activities in Target Housing and Child-Occupied Facilities, Final Rule, 29 August 1996. (Regulations under Title X, Secs 402 and 404: training, certification, work practice standards, requirements for State programs.) (Cited in para 3-2d.)

24 CFR Part 35, Lead-Based Paint Poisoning Prevention in Certain Residential Structures.

(1) Subpart E, Elimination of Lead-Based Paint Hazards in Federally-Owned Properties Prior to Sale for Residential Habitation, 4-1-95 Edition.

(2) Subpart H, Disclosure of Known Lead-Based Paint and/or Lead-Based Paint Hazards Upon Sale or Lease of Residential Property, 6 March 1996. (Cited in para 3-2g.)

29 CFR Part 1910.1025, Occupational Safety and Health Administration, Lead Standard for Non-Construction Activities Such as Routine Maintenance. (Cited in paras 3-2g and 3-2g.)

29 CFR Part 1926, Occupational Safety and Health Administration, Lead Exposure in Construction; Interim Final Rule, 4 May 93. (Cited in paras 3-2f and 3-2j.)

National Institute of Building Sciences (NIBS). Lead-Based Paint: Operations and Maintenance Work Practices Manual for Homes and Buildings (May 95). (Cited in para 3-2j.)

Appendix B

Technical Guidance on Lead in Vinyl Miniblinds

B-1. General

a. On June 25, 1996, the Consumer Product Safety Commission (CPSC) issued press release #96-150, entitled "CPSC Finds Lead Poisoning Hazard for Young Children in Imported Vinyl Miniblinds." The CPSC release applies only to nonglossy vinyl plastic miniblinds imported from China, Taiwan, Mexico, and Indonesia. They are made with plastics containing lead, which is released when the plastic surfaces deteriorate from heat or sunlight.

b. The CPSC has not actually recalled any vinyl miniblind products; however, the CPSC recommends removing these miniblinds in housing where young children live. Complying with the CPSC recommendation is not only health-protective but practical, because of the relatively low cost of replacement products.

B-2. Policy. The Army's policy of providing a healthful living and working environment for soldiers, their families, and civilians includes controlling lead hazards from all sources, including miniblinds. Installation housing, environmental, safety, preventive medicine, legal and public affairs staff should cooperate in a lead hazard management team effort to identify, prioritize, remove, and dispose of these miniblinds, and to educate occupants on ways in which they can protect their families from lead exposure. Lead-containing miniblinds do not constitute an immediate health threat, but are a health concern.

B-3. Procedure. Where possible, determine whether miniblinds are lead-containing:

a. Inspect miniblinds to ensure that they are plastic, and do not have a high-gloss finish. Metal and high-gloss finish plastic miniblinds are not included in the CPSC warning.

b. Assume the miniblinds are lead-containing unless the supplier can confirm otherwise. Suppliers may be able to identify brands of miniblinds which contain lead and may be willing to exchange or offer refunds or credit on returns. The CPSC release notes that many miniblinds have been sold without a brand name. The Window Covering Safety Council, an industry association, confirms that virtually all non-gloss vinyl miniblinds (which they define as having one-inch wide slats) imported from the four countries named by CPSC contain lead. CHPPM does not recommend the use of chemical spot test kits or x-Ray fluorescence (XRF) devices to determine if non-gloss miniblinds contain lead. If an installation considers it essential to determine whether their miniblinds contain lead, then contact CHPPM for suggestions on sampling and analyses.

c. Prioritize the removal of lead-containing miniblinds from facilities that currently house or

are frequented by children under the age of 6 years and pregnant women. This includes family housing units, family child care homes, child development centers, and other nonresidential facilities where children may come into contact with miniblinds or the lead contaminated dust from deteriorated miniblinds. In addition, non-gloss miniblinds should be removed from facilities that may be occupied in the future by children under 6 years old and pregnant women.

d. Clean miniblinds only if necessary as a short term solution prior to removal. To minimize the possibility of disturbing and spreading dust, lead-containing miniblinds should not be cleaned in place. When miniblinds are removed prior to cleaning, wash window sills and bare floors to which dust may have spread. Provide suitable cleaners at the self-help store and advise occupants on proper cleaning methods and precautions. Cleaning solutions should be prepared by manufacturer's instructions. Use either a high-phosphate detergent (at least 5 percent trisodium phosphate (TSP), or a nonphosphate cleaner that is formulated specifically for lead dust removal. The use of high-phosphate detergents is banned in some states. TSP is an eye and skin irritant and may damage some finishes. Wear disposable rubber or plastic gloves. Use three containers: one for fresh cleaning solution; one for used cleaning solution; and one for clear water rinse. Keep cleaning compounds and cleaning solutions out of the reach of small children. Wash hands thoroughly after cleaning.

e. Remove miniblinds while wearing disposable gloves and then place the miniblinds in thick tear-resistant 6mm plastic bags. Handle miniblinds as gently as possible to minimize disturbing any dust on their surfaces. Store the removed miniblinds in locations inaccessible to children prior to proper disposal of the miniblinds. Clean the window sills and floors below the windows as soon as possible following removal. Installation personnel can be trained to remove the non-gloss miniblinds. Personnel involved in removal activities should wear protective clothing and equipment that fully covers the skin. If occupants remove miniblinds themselves, advise them of the potential hazard from spreading dust and how to protect themselves and their families, including proper removal and cleanup methods.

f. Dispose of miniblinds from residential structures as general trash in an authorized landfill or municipal incinerator in accordance with the Resource Conservation and Recovery Act (RCRA) household waste exclusion in 40 CFR 261.4(b). Dispose of miniblinds in small quantities as they are generated, rather than accumulating larger volumes, to reduce the possibility of exceeding the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Reportable Quantity for lead (1 pound in a 24-hour period).

(1) Since waste from non-residential structures is not exempt from RCRA, and since preliminary Toxicity Characteristic Leaching Procedure (TCLP) data indicate that the miniblinds contain leachable lead at levels that far exceed the hazardous waste (HW) regulatory limit, miniblinds removed from these structures should be disposed of as a HW. Because of this preliminary data, use generator knowledge to characterize this waste as hazardous instead of

using expensive analytical tests.

(2) Try to return any large volumes of unused miniblinds in storage to the manufacturer. Several companies have indicated that refunds and/or credit may be given for unused items. If the manufacturers will not accept the miniblinds, dispose of them. Have a representative TCLP test performed to determine whether there is leachable lead above the HW limit (unused miniblinds may not leach to the same extent as used blinds since they have not been exposed to light and heat). CHPPM may be requested to provide limited analytical support. Facilities independently performing TCLP on miniblinds are requested to furnish a copy of the results to CHPPM. Questions relating to disposal may also be addressed to the U.S. Army Environmental Center (AEC), DSN 584-7076. Ensure that disposal complies with all federal, state, and local requirements.

g. Replace lead-containing miniblinds, do not install any lead-containing miniblinds, and cancel or amend orders or procurement actions that may result in the purchase of lead-containing miniblinds. Contact the supplier to exchange lead-containing miniblinds for lead-free miniblinds. Metal or reformulated plastic miniblinds are suitable replacements but may cost more.

h. Document the installation's decisions and actions concerning vinyl miniblinds to protect against future liabilities.

B-4. Technical points of contact

a. Medical point of contact. Mr. Geoffrey Braybrooke, Ms. Victoria F. Belfit, and Ms. Deborah A. Brown, CHPPM, DSN 584-3118.

b. Environmental points of contact

(1) Mr. Michael C. Worsham, AEC, DSN 584-7076.

(2) Mr. F. Matthew Walter, CHPPM, DSN 584-3651.

c. Facilities point of contact. Mr. Fidel J. Rodriguez, U.S. Army Center for Public Works (CECPW), DSN 656-5979.

Appendix C

Controlling Lead Paint on Public Playground Equipment

C-1. Introduction. The purpose of this appendix is to report U.S. Consumer Product Safety Commission (CPSC) findings that indicate a potential lead paint poisoning hazard for young children (6 years and younger) from some public playground equipment; and to provide recommendations for identifying and controlling the hazard to reduce the risk of childhood lead poisoning from playground equipment.

C-2. Background

a. Ingestion of lead from deteriorating paint is a major source of lead poisoning for children 6 years old and under. The effects of lead ingestion are cumulative. In children, behavioral problems, learning disabilities, hearing problems, and growth retardation have been associated with sustained blood lead levels as low as 10 micrograms per deciliter ($\mu\text{g}/\text{dl}$). In 1978, CPSC banned the sale of paint containing in excess of 0.06 percent lead intended for consumer use. It also banned toys and other articles intended for use by children, such as playground equipment, that uses paint with a lead content in excess of 0.06 percent because they present a risk of lead poisoning in young children (16 CFR Part 1303).

b. Nationwide efforts to address lead paint hazards in homes and elsewhere have used 0.5 percent lead by weight as the level of lead in paint that should be targeted for lead hazard control measures. This level, cited in the 1992 Residential Lead-Based Paint Hazard Reduction Act (Pub.L. 102-550, Title X, October 28, 1992), has helped focus attention and resources on controlling the most significant lead paint hazards.

c. Testing by CPSC and some state and local jurisdictions has shown that many school, park, and community playgrounds across the United States have painted metal or wood playground equipment that present an additional potential lead paint poisoning hazard for young children. The equipment was painted with lead paint, and over time, the paint has deteriorated into chips and dust containing lead, due to exposure to sunlight, heat, moisture, and normal wear and tear. The lead paint chips and lead dust can be ingested by young children who put their hands on the equipment while playing and then put their hands in their mouths.

C-3. Health Risk Assessment

a. CPSC, the Centers for Disease Control and Prevention (CDC), EPA, HUD, and other Federal agencies, state that blood lead levels above 10 $\mu\text{g}/\text{dl}$ are a health concern and recommend community-wide preventive measures (CDC, 1991 and CPSC, 1992a,b). Sustained blood lead levels of 10 $\mu\text{g}/\text{dl}$ or greater have been associated with a variety of adverse health effects including deficits in neurobehavioral function and intellectual performance, developmental delays,

decreased stature, and diminished hearing acuity. To prevent young children from exceeding the 10 $\mu\text{g}/\text{dl}$ blood lead level of concern, CPSC suggests that chronic ingestion (about 15-30 days considered surrogate for chronic ingestion) of lead from paint and other consumer products not exceed 15 μg lead/day (CPSC, 1990). The limit of 15 μg lead/day is based on human chronic exposure models relating ingested lead to blood lead levels (CPSC, 1989, 1990, 1992a,b). Included in the 15 $\mu\text{g}/\text{day}$ limit is consideration of several parameters such as amount of lead ingested, lead absorption, weight of lead paint, and other background sources of lead.

b. CPSC has determined that daily ingestion over about 15-30 days of as little as one-tenth of a square inch of paint (about the size of the head of a pencil eraser) could result in blood lead levels at or above the 10 $\mu\text{g}/\text{dl}$ amount the Federal government considers a health concern, especially for young children. This determination is based upon the median level of lead found on playground equipment that exceeds the 0.5 percent lead level (1.47 percent) and assumes an absorption of 30 percent.

C-4. Recommendations

a. Deteriorating lead paint in homes poses the most significant lead poisoning health risk to young children and requires immediate attention. Playground equipment with deteriorating lead paint is an additional and avoidable source of lead to which children may be exposed. Since the health effects of lead are cumulative, exposure to lead from playground equipment can contribute to the overall risk to children.

b. CPSC investigation of older playground equipment reveals a wide range of lead levels and paint conditions. Just knowing that a playground has paint containing lead may not indicate if there is a hazard. CPSC does not consider playground equipment with lead paint that is intact and in good condition to be a hazard. Over time, paint will deteriorate from exposure to sunlight, heat, moisture, and normal wear and tear. If that paint contains lead, it does present a hazard once it deteriorates, and requires attention.

c. To be consistent with the intent of Title X to focus attention and resources on areas with the highest levels of lead, responsible authorities should give priority attention to playground equipment with lead levels at 0.5 percent lead and above. CPSC believes that a reduced priority, but nevertheless important for authorities to consider, is the risk that exists to children from lead paint at levels between 0.06 percent and 0.5 percent.

d. To reduce the risk of childhood lead poisoning, CPSC recommends the following strategy for identifying and controlling the lead paint hazard associated with older public playground equipment. The strategy complements the framework described in the 1995 Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing that was developed by HUD and other Federal agencies to support the requirements of Title X.

e. The appropriate control measures must be determined on a case-by-case basis, considering such factors as condition of the paint; percent of lead present; the playground equipment's age, location, use, and overall safety; the financial resources available to address this and other lead paint hazards; the relative costs of control measures; and the regulatory requirements of individual states, cities, and localities. Continued monitoring (visual inspection) may be an appropriate control measure for intact paint even if it contains lead.

f. When and how to check and test playground equipment for lead hazards - lead hazard assessment. A lead hazard assessment for playground equipment may include a visual inspection, examination of records, paint testing, characterization of the hazard, identification of potential control measures, and a plan for establishing the priority for the implementation of control measures.

(1) Conduct a visual inspection of the playground and the equipment.

The visual inspection should:

(a) Examine the condition of the entire painted surface. Any painted surface that has not been repainted after 1977 should be assumed to contain lead, since the ban on lead paint did not come into effect until 1978. Even if the surface has been repainted after 1977, the paint should be considered suspect unless records have been maintained showing that nonleaded paint was used. Also, the original paint may contain lead, and this paint may become available for ingestion when the repainted surface deteriorates.

(b) Identify areas of visible paint chips and dust accumulation. Lead chips and dust are generated as lead paint deteriorates over time due to weathering, aging, and moisture; or is disturbed in the course of renovation or repair. Check for the presence of paint chips underneath the playground equipment.

(c) Evaluate the need for significant structural repairs or changes to the equipment that are likely to affect the integrity and condition of the painted surface.

(2) Evaluate the results of the visual inspection.

(a) If the paint is intact and in overall good condition, there is no visible paint dust or paint chips, and significant repairs or equipment changes are not needed, one of two alternatives can be taken: monitoring (periodic visual inspection) or laboratory testing to determine if the paint contains lead.

(b) Lead paint is not considered to be a hazard until it deteriorates. Accordingly, CPSC staff recommends that such equipment be monitored (visually inspected) on a regular basis to ensure that the paint has not deteriorated. This inspection can be coordinated with regular

safety inspections. For information on playground safety, consult the CPSC Handbook for Public Playground Equipment Safety. The handbook is available from CPSC (1-800-638-2772 or info@cpsc.gov). If at any time, the painted surface begins to deteriorate, paint samples should be collected and analyzed for lead.

(c) If laboratory testing is conducted on intact paint and the presence of lead is confirmed, continued monitoring (visual inspection) can be implemented as a control measure to ensure that the paint does not deteriorate. If the paint is in a deteriorating condition (as noted by its peeling, cracking, chipping, or chalking), paint samples should be collected from several locations on the playground equipment (sampling each type and color of paint) for laboratory testing. Red, orange, yellow, green, and brown paint are the colors most likely to contain lead. Priority should be given to collecting and analyzing deteriorating paint from playground equipment that you know has been painted or repainted before 1978.

(d) The amount of lead in the paint is one important factor in deciding whether control measures are needed. If the visual inspection indicates the need for significant structural repairs or changes to the equipment that are likely to affect the integrity and condition of the painted surface (i.e., will result in peeling, cracking, chipping, chalking), the paint should be tested to determine if it contains lead before any repair work begins. Laboratory analysis is the most accurate and reliable way to determine the presence and amount of lead in a paint sample.

(3) Evaluate the results of the laboratory tests.

(a) If the laboratory analysis indicates that the paint contains lead levels that are equal to or exceed 0.5 percent by weight, and the paint is deteriorated, the extent of the hazard should be characterized and control measures undertaken. Control measures for lead paint between 0.06 percent and 0.5 percent are to be considered, however, priority should be given to implementing control measures for deteriorating paint at, or above, 0.5 percent.

(b) EPA is currently developing an addendum to their July 14, 1994 (60 Federal Register: 47248) guidance on lead-based paint, lead-contaminated dust, and lead-contaminated soil. The addendum will address the issue of soil and playgrounds.

(c) Playground equipment should be inspected and regularly maintained to ensure that it meets safety guidelines and provides a safe environment for children, regardless of whether it contains lead paint.

(4) Characterize the hazard. The surface area of paint containing 15 μg of lead that a child would need to ingest over about 15-30 days to exceed a blood lead level of 10 $\mu\text{g}/\text{dl}$ was estimated by CPSC. The surface area was estimated using a range of lead concentrations that have been found, or might be found in playground paint samples, and the easily extracted lead

percentages (bioavailability surrogate representing the amount of lead absorbed by the body) found in samples tested by CPSC's Health Sciences Laboratory.

g. How to control the lead hazard from public playground equipment - lead hazard controls

(1) Just knowing that a playground has paint containing lead may not indicate if there is a hazard. CPSC does not consider playground equipment with lead paint that is intact and in good condition to be a hazard. Therefore, continued monitoring (visual inspection) is essential, and may be an appropriate control measure for intact paint containing lead.

(2) Over time, paint will deteriorate due to exposure to changing weather conditions and normal wear and tear. If that paint contains lead, it does present a hazard once it deteriorates, and requires attention.

(3) Priority should be given to controlling deteriorating leaded paint on public playground equipment containing lead in amounts equal to or exceeding 0.5 percent by weight. Because playground equipment is intended for use by children, consideration of measures that permanently eliminate the potential hazard posed by lead paint are recommended. In general, interim control measures for playground equipment may be considered appropriate if the playground is slated for repair or the equipment is expected to be replaced within a few years.

(4) While interim control measures often have a lower initial cost than permanent control measures, they require regular monitoring and re-evaluation to ensure that the lead paint is still intact. In some cases, permanent control measures may be more cost-effective over the long-term than interim control measures when the cost of monitoring is considered.

h. Interim control measures

(1) Stabilize and cover the lead paint surface with nonleaded paint or an encapsulant. Because outdoor metal and wood playground equipment is continually subject to deterioration due to exposure to sunlight, heat, moisture, and wear and tear through normal play activities, covering the lead paint surface with nonleaded paint or encapsulants will only temporarily reduce human exposure to lead. Covering the lead paint surface requires ongoing and regular monitoring because lead paint is still present and may become hazardous in the future. Sanding, scraping, and using power tools to prepare the surface to be repainted or encapsulated can increase the hazard by spreading lead paint chips and dust. Precautionary measures outlined in the 1995 HUD Guidelines and the 1996 EPA Section 402 Rule, Lead Requirements for Lead-Based Paint Activities, should be followed to ensure that lead control measures are conducted safely.

(2) Encapsulants are coatings that provide a barrier between the lead paint and the environment. They vary in their effectiveness and how long they are expected to last. The degree

of adherence depends on the encapsulant used and the substrate to which it will be applied. While some encapsulants may last for many years, they were developed for use in interior spaces. Their effectiveness and longevity in outdoor environments where they are subject to deterioration from changing weathering conditions is uncertain. Therefore, encapsulants for playground equipment should be considered only as an interim measure.

(3) In addition, according to the 1995 HUD Guidelines, encapsulants are generally not effective on metal surfaces that are prone to rust or corrosion unless a proper corrosion-control primer is used before the application of the encapsulant.

(4) Playground equipment that has been covered with an encapsulant or nonleaded paint requires regular monitoring (visual inspection) throughout the life of the equipment. Such monitoring would allow detection if the surface does not remain in good condition throughout changing weather conditions and wear due to normal play activities.

i. Permanent control measures

(1) Replace the playground equipment. Replacing playground equipment or component parts that contain lead paint is the most definitive way to eliminate the risk of lead poisoning from exposure to lead paint on playground equipment. Because of varying regulations regarding hazardous waste storage, transport, and disposal, state/local health departments or environmental agencies should be contacted to find out what laws are applicable.

(2) Remove lead paint. Removal of LBP should be performed by a lead paint removal professional who is trained, certified, or licensed to remove lead hazards. Removing lead paint improperly can increase the hazard by spreading lead chips and dust around the play area. Surfaces should be repainted with paint containing no more than 0.06 percent lead, according to CPSC regulations.

**Appendix D
Lead Hazard Management Program Review Checklist**

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PROGRAM PERFORMANCE		
GREEN	AMBER	RED
<ul style="list-style-type: none"> ▶ 1. The installation has an active lead management program which is focused on children under six years of age, pregnant women, and workers. Training and certification are current. ▶ 2. A written installation lead management plan has been developed which provides a safe and healthy living and working environment. The program identifies work methods, quality assurance, quality control, and clearance procedures to be used when performing in-place management, repair, alteration, or demolition work which may result in the disturbance of known or suspected leaded paint. ▶ 3. All target housing and other child-occupied facilities have been inspected and assessed for lead hazards. High risk facilities have been identified. Facility use/assignment policies prevent lead exposure to children under six years of age from high risk facilities. ▶ 4. An in-place management plan for target housing and child-occupied facilities has been implemented to identify and treat defective lead containing paint and lead in household dust and soil. Where in-place management is not effective, a plan has been implemented to abate sources of lead hazards. 	<ul style="list-style-type: none"> ▶ The installation is developing a lead management program. Training needs have been identified but training and certification are in process. ▶ A lead management plan is being developed. Actions which result in disturbance of known or suspected lead containing paint are managed on a case by case basis. ▶ Inspection and assessment of target housing and child related facilities are programmed or underway. High risk facilities have been tentatively identified. Children are protected from lead exposure in suspected high risk facilities. ▶ An in place management plan is being developed. Probable sources of lead hazards have been identified and abatement actions are being developed. 	<ul style="list-style-type: none"> ▶ The installation does not have a lead management program. ▶ There is no lead management plan. Occupants and workers are not protected from work which disturbs lead containing paint. ▶ Target housing and child-occupied facilities have not been inspected and assessed. High risk facilities have not been identified. Children are not protected from lead exposure in high risk facilities. ▶ No in place management plan has been developed.

PROGRAM PERFORMANCE (Cont'd)		
GREEN	AMBER	RED
<p>► 5. Records and data are current, complete, and accurate to document historical construction and maintenance data, results of lead testing and risk assessments, worker surveillance and exposure, and hazardous waste management.</p>	<p>► Records and data are not current, complete, or accurate.</p>	<p>► Records are not maintained or do not exist.</p>

MISSION IMPACT		
GREEN	AMBER	RED
<p>► 1. Lead containing paint is managed so that there is no significant impact on the quality of life of soldiers and their families</p>	<p>► Lead containing paint is managed so that there is minor impact on the quality of life of soldiers and their families.</p>	<p>► Lead containing paint has a significant impact on the quality of life of soldiers and their families.</p>

D-3

ENVIRONMENTAL HEALTH		
GREEN	AMBER	RED
<ul style="list-style-type: none"> ▶ 1. Children and pregnant women are not exposed to high risk conditions. ▶ 2. Construction workers are protected from exposure to lead. A medical monitoring program for workers has been implemented. Workers and supervisors are properly trained and certified. ▶ 3. High risk conditions have been identified and abated. ▶ 4. Children are screened and tested for elevated levels of lead in blood. No children require environmental or medical intervention. 	<ul style="list-style-type: none"> ▶ No indicator. ▶ A medical monitoring program for workers is being developed. Workers and supervisors are being trained and certified. ▶ High risk conditions have been identified and are programmed for abatement and in place management is effectively controlling the risk. ▶ No children have tested above 19 $\mu\text{g}/\text{dl}$. Cases requiring environmental intervention have been investigated and corrective actions successfully completed. 	<ul style="list-style-type: none"> ▶ Children and pregnant women are exposed to high risk conditions. ▶ A medical monitoring program is being considered. Workers and supervisors have not been trained and certified. ▶ High risk conditions are not identified, controlled, or programmed for abatement. ▶ Children have tested above 19 $\mu\text{g}/\text{dl}$. Environmental and medical interventions have not been performed or completed.

COMPLIANCE		
GREEN	AMBER	RED
<ul style="list-style-type: none"> ▶ 1. The installation is in compliance with applicable Army, Federal, state, and local regulations with respect to prevention of childhood lead poisoning, training, health monitoring and surveillance, waste characterization and disposal, and worker protection. ▶ 2. All known TSCA Title IV requirements (Class I and II) are identified on RCS 1383 and funded in the current year, as well as Program Management projects necessary to achieve or sustain compliance. ▶ 3. Waste characterization of lead contaminated structural building components and debris from demolition of entire buildings is performed based on current Army guidance and solid waste is disposed of following applicable requirements. 	<ul style="list-style-type: none"> ▶ The installation is generally in compliance with regulations concerning lead containing paints. Action is being taken to ensure full compliance. ▶ All known legal requirements are identified in RCS 1383 and are funded in the current year, as well as Program Management projects necessary to achieve or sustain compliance. However, significant potential exists for slippage of execution of projects due to unresolved issues. ▶ No indicator. 	<ul style="list-style-type: none"> ▶ The installation is not in compliance with applicable regulations concerning lead containing paints or the installation has received enforcement actions which have not been fully resolved. ▶ All known legal requirements are not identified in RCS 1383, as well as Program Management projects necessary to achieve or sustain compliance. ▶ Waste characterization of lead contaminated building components and debris from demolition of entire buildings is not performed based on current Army guidance and hazardous waste is not disposed of following applicable requirements.

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Appendix E

Supporting Lead Hazard Management Documentation

The documents listed below provide additional supporting material related to the lead hazard management program.

DoD Memorandum, SUBJECT: Lead-Based Paint (LBP) - Risk Assessment, Associated Health Risk in Children, and Control of Hazards in Housing and Related Structures, 24 Nov 92 (Facilities, medical, and environmental policy).

DoD Memorandum, SUBJECT: Modification of Pediatric Blood Lead Screening Program, 26 Jun 95.

DoD Memorandum, SUBJECT: Asbestos, Lead and Radon Policies at BRAC Properties, 31 Oct 94 (excerpt for lead).

DoD Interagency Lead-Based Paint Task Force, Lead: A Quick Reference Guide for the Industrial Hygienist, Apr 95 (Also available on the InterNet, <http://131.92.168.27//Armyih/Docs/lead-guide.htm>).

DoD Interagency Lead-Based Paint Task Force, Lead: A Quick Reference Guide for the Industrial Hygienist, Apr 1995.

Memorandum, HQDA, Assistant Chief of Staff for Installation Management, DAIM-FDF-C, subject: Lead-Based Paint Contaminated Debris - AEHA Guidance, 29 Mar 1994.

DA Memorandum, SUBJECT: Lead-Based Paint Policy Guidance, 28 Apr 93 (Facilities and Environmental Policy).

DA Memorandum, SGPS-PSP, SUBJECT: Childhood Lead Poisoning Prevention, 26 May 93 (Medical policy).

DA Memorandum, DAIM-FDH-F, SUBJECT: Army Lead-Based Paint Management, 23 Jul 96.

DA Memorandum, DAIM-FDH-F, SUBJECT: Disclosure Requirements for Lead-Based Paint Hazards in Army Family Housing, 24 July 96 (for 24 CFR 35 disclosure rule).

USACE Guide Specifications CEGS 02090, Lead Based Paint (LBP) Abatement and Disposal, Apr 1994.

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USACE Guide Specification CWGS-09940, Painting: Hydraulic Structures, Dec 1995
(Applicable to all outdoor steel structures).

HUD 24 CFR 35/EPA 40 CFR 745 (6 Mar 96) Lead: Requirements for Disclosure of Known Lead-Based Paint and Lead-Based Paint Hazards in Housing; Final Rule. (Regulations under Title X, Sec 1018: information to be provided to new occupants of Army family housing.)

HUD 24 CFR 35-37 (7 Jun 96) Requirements; Notification, Evaluation, and Reduction of Lead-Based Paint Hazards in Federally Owned Residential Property and Housing Receiving Federal Assistance (for regulations under Title X, Sections 1012-1013: potential requirements for BRAC).

Memorandum, U.S. Environmental Protection Agency, subject: Guidance on Residential Lead-Based Paint, Lead Contaminated Dust, and Lead Contaminated Soil, 14 July 1994 (codified in Federal Register 11 September 1995).

EPA Guidance on Identification of Lead-Based Paint Hazards. Federal Register v 60 n 175 pp 47247-47257 (11 Sep 95) (Interim guidance for lead hazard evaluation pending Proposed Rule under Title X, Sec 403: health-based standards for lead in paint, dust and soil. Reprint of Lynn Goldman memorandum of 14 Jul 94).

EPA Pamphlet 747-K-94-001, Protect Your Family from Lead in Your Home (May 95)
(Developed for 24 CFR 35 disclosure rule compliance - may be reproduced locally, or obtained free as camera-ready copy in English or Spanish by FAXED request to National Lead Information Center, NLIC (Attn: Ana Rita), (202-659-1192).

EPA Pamphlet 747-R-94-002, Reducing Lead Hazards When Remodeling Your Home (Apr 94)
(May be reproduced locally, or obtained free in limited numbers from NLIC Hotline, 1-800-424-LEAD).

USACHPPM, Mission-area Guide to Lead-Exposure Control (Mar 96) (Discussion of personnel exposures to lead from all known or suspected sources).

USACHPPM Fact Sheet 93-001-1294 through 93-013-1294 (Tech Guide No. 203), various topics.

USACE Lead Based Paint (LBP) Lead Hazard containment Setup Drawings (1994) (Includes notes).

U.S. Army Center for Health Promotion and Preventive Medicine Technical Guide 198, A Commander's Guide to Childhood Lead Poisoning Prevention/Lead-Based Paint Management

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Program on DOD Installations, June 1993. [Available from CDR, USACHPPM, ATTN: MCHB-CS-IIS, Aberdeen Proving Ground, MD 21010-5422, (410) 671-1021 or DSN 584-1021.]

Centers for Disease Control (CDC), 1991. Preventing Lead Poisoning in Young Children. A Statement by the Centers for Disease Control - October 1991.

U.S. Consumer Product Safety Commission (CPSC), 1992b. 57 Federal Register: 18418. Regulatory Investigation: Lead in Paint.

Title 42, United States Code 4821 (42 USC 1971), The Lead-Based Paint Poisoning Prevention Act of 1971.

U.S. Department of Labor, OSHA Instruction CPL 2-2.58, subject: 29 CFR 1926.62, Lead Exposure in Construction; Interim Final Rule -- Inspection and Compliance Procedures, December 13, 1993.

EPA Memorandum, OSWER Directive # 9355.4-12, SUBJECT: Revised Interim Soil Lead Guidance for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Sites and Resource Conservation Recovery Act (RCRA) Corrective Action Facilities (14 Jul 94).

EPA Pamphlet 812-B-94-002, Lead in Drinking Water in Schools and Non-Residential Buildings (Apr 94).

USAEHA Technical Guide No. 198, A Commander's Guide to Childhood Lead Poisoning Prevention/Lead-Based Paint Management Program on DOD Installations (Jun 93).

USAEHA Interim Final Report - Lead-Based Paint Contaminated Debris Waste Characterization Study No. 27-26-JK44-92, May 1992-May 1993 (Study with protocol for waste characterization).

National Institute of Building Sciences (NIBS). Guide Specifications for Reducing Lead-Based Paint Hazards (May 95)

Appendix F

Lead Hazard Management Training Program

F-1. Training requirements

The U.S. Environmental Protection Agency (EPA), the Occupational, Safety, and Health Administration (OSHA), and state and local agencies have established qualifications and training requirements for personnel who perform inspections, risk assessment, interim control, and abatement activities in lead hazard management.

F-2. U.S. Environmental Protection Agency training requirements

Individuals identified below are required (except for project designer) to be trained by an accredited training program, as defined by 40 CFR Part 745, Subpart L, and certified by EPA pursuant to 40 CFR Part 745.226 (See Federal Register, 29 August 1996, pages 45777-45830, "Lead; Requirements for Lead-Based Paint Activities in Target Housing and Child-Occupied Facilities; Final Rule). This EPA final rule establishes training and certification for lead-based paint activities mandated by the Toxic Substances Control Act (TSCA), Section 402.

- a. **Certified Inspector.** A person who conducts a surface-by-surface investigation to determine the presence of lead-based paint and the provision of a report explaining the results of the investigation of samples for the presence of lead in dust and soil for the purposes of abatement clearance testing.
- b. **Certified Risk Assessor.** A person who conducts an on-site investigation to determine the existence, nature, severity, and location of lead-based paint hazards, and the provision of a report by the individual or the firm conducting the risk assessment, explaining the results of the investigation and options for reducing lead-based paint hazards. A certified risk assessor also samples for the presence of lead in dust and soil for the purposes of abatement clearance testing.
- c. **Certified Project Designer.** A person who prepares abatement project designs, occupant protection plans and abatement reports. EPA does not require that a Certified Project Designer be used for work covered by 40 CFR Part 745, Subpart L. It is the building owner option to determine whether to use a trained project designer or not. EPA does, however, provide for training accreditation and certification in this discipline.
- d. **Certified Supervisor.** A person who supervises and conducts abatements, and who prepares occupant protection plans and abatement reports.
- e. **Certified Abatement Worker.** A person who performs abatement work.

F-3. Occupational, Safety, and Health Administration training requirements

The Occupational, Safety, and Health Administration (OSHA) has established training requirements for supervisors and workers that apply regardless if the work is considered abatement or interim controls. For on-site supervisors, designated OSHA competent persons, and workers who perform work activities covered by OSHA standards 29 CFR Part 1926.62 (lead in construction) and 29 CFR 1910.1025 (lead in general industry), training is required which complies with those standards for the specific type of work to be performed.

F-4. State and local training requirements

A number of states and local agencies have established qualification, training, and other requirements for work associated with lead abatement and lead hazard control activities. In addition, 40 CFR Part 745, Subpart L provides a mechanism for states and local agencies to apply, obtain approval, administer, and enforce their own lead-based paint activities programs. For states and local agencies that obtain such approval, personnel identified in para F-1 above shall meet those qualification and training requirements. For States and local agencies that do not apply to administer and enforce their own lead-based paint activities programs, the EPA requirements shall apply.

Appendix G
Disclosure of Known Lead-Based Paint and/or Lead-Based Paint Hazards

G-1. General

a. On 6 March 1996, HUD and EPA jointly issued identical final rules, codified as 24 CFR Part 35, Subpart H, and 40 CFR Part 745, Subpart F. Both rules are titled: Disclosure of Known Lead-Based Paint and/or Lead-Based Paint Hazards in Housing. These final rules implement Section 1018, Disclosure of Information Concerning Lead Upon Transfer of Residential Property, of Title X (Public 102-550).

b. The HUD final rule (24 CFR Part 35, Subpart H) supersedes notification requirements in 24 CFR Part E, Subpart 35.

G-2. HUD/EPA Final Rule. The final rule (effective September 6, 1996) applies to the lease or sale (BRAC or similar actions) of pre-1978 military housing. HUD views military family housing on active installations as leased housing. Housing to be disposed of by BRAC or similar actions is covered by this disclosure rule. Exempt from the disclosure rule is housing that is:

a. Sold at foreclosure.

b. Intended for lease and is found to be free of LBP by an inspector certified under the Federal Certification Program or under a federally accredited State certification program.

c. Intended for lease for a period of less than 100 days.

d. Intended for renewal of a lease in which all required information has been previously disclosed to the lessee and where no new information has come into the possession of the military department.

G-3. Disclosure Requirements. EPA and HUD consider disclosure to have occurred when the seller or lessor has provided the following items to the purchaser or lessee:

a. A lead hazard information pamphlet approved by the EPA. An example of an approved pamphlet entitled Protect Your Family From Lead in Your Home (EPA #747-K-94-001), is available from EPA (telephone: 1-800-LEAD-FYI).

b. Notice of the presence of known LBP and/or lead-based paint hazards available to the seller or lessor.

G-4. Opportunity to Conduct an Evaluation. Purchasers of target housing have a 10-day

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period to conduct an assessment or inspection for the presence of LBP and/or lead-based paint hazards. This requirements may be shortened, extended, or waived by mutual consent.

G-5. Certification and Acknowledgment of Disclosure. Each contract to lease target housing must include:

- a. A "Lead Warning Statement."
- b. A statement disclosing the presence of known lead-based paint or hazards.
- c. A list of records or reports that have been provided to the lessee.
- d. A statement by the lessee affirming receipt of the information and reports.

Sample disclosure formats are provided at the end of this appendix, figures G-1 and G-2.

G-6. Enforcement. Both EPA and HUD provide for civil and criminal sanctions and monetary penalties for any person who knowingly fails to comply with any provision of the regulation. Any person who knowingly violates the provisions of the regulation shall be jointly and severally liable to the purchaser or lessee in an amount equal to 3 times the amount of damages incurred by such individual.

**Disclosure of Information on Lead-Based Paint and
Lead-Based Paint Hazards for Target Housing Rentals and Leases**

Lead-Warning Statement - Housing built before 1978 may contain lead-based paint. Lead from paint, paint chips, and dust can pose health hazards if not taken care of properly. Lead exposure is especially harmful to young children and pregnant women. Before renting pre-1978 housing, landlords must disclose the presence of known lead-based paint and lead-based paint hazards in the dwelling. Tenants must also receive a Federally approved pamphlet on lead poisoning prevention.

Lessor's Disclosure (initial)

_____ (a) Presence of lead-based paint and/or lead-based paint hazards (check one below):

- Known lead-based paint and/or lead-based paint hazards are present in the housing (explain).

- Lessor has no knowledge of lead-based paint and/or lead-based paint hazards in the housing.

_____ (b) Records and reports available to the lessor (check one below):

- Lessor has provided the lessee with all available records and reports pertaining to lead-based paint and/or lead-based paint hazards in the housing (list documents below).

- Lessor has no reports or records pertaining to lead-based paint and/or lead-based paint hazards in the housing.
-

Lessee's Acknowledgment (initial)

_____ (c) Lessee has received copies of all information listed above.

_____ (d) Lessee has received the pamphlet *Protect Your Family from Lead in Your Home*.

Agent's Acknowledgment (initial)

_____ (e) Agent has informed the lessor of the lessor's obligations under 42 USC 4582(d) and is aware of his/her responsibility to ensure compliance.

Certification of Accuracy

The following parties have reviewed the information above and certify, to the best of their knowledge, that the information provided by the signatory is true and accurate.

_____ Lessor	_____ Date	_____ Lessor	_____ Date
_____ Lessee	_____ Date	_____ Lessee	_____ Date
_____ Agent	_____ Date	_____ Agent	_____ Date

Figure G-1. Sample Disclosure Format for Target Housing Rentals and Leases

**Disclosure of Information on Lead-Based Paint and
Lead-Based Paint Hazards for Target Housing Sales**

Lead-Warning Statement - Every purchaser of any interest in residential real property on which a residential dwelling was built prior to 1978 is notified that such property may present exposure to lead from lead-based paint that may place young children at risk of developing lead poisoning. Lead poisoning in young children may produce permanent neurological damage, including learning disabilities, reduced intelligence quotient, behavioral problems, and impaired memory. Lead poisoning also poses a particular risk to pregnant women. The seller of any interest in residential real property is required to provide the buyer with any information on lead-based paint hazards from risk assessments or inspections in the seller's possession and notify the buyer of any known lead-based paint hazards. A risk assessment or inspection for possible lead-based paint hazards is recommended prior to purchase.

Seller's Disclosure (initial)

_____ (a) Presence of lead-based paint and/or lead-based paint hazards (check one below):

- Known lead-based paint and/or lead-based paint hazards are present in the housing (explain).
- _____

- Seller has no knowledge of lead-based paint and/or lead-based paint hazards in the housing.

_____ (b) Records and reports available to the seller (check one below):

- Seller has provided the purchaser with all available records and reports pertaining to lead-based paint and/or lead-based paint hazards in the housing (list documents below).
- _____

- Seller has no reports or records pertaining to lead-based paint and/or lead-based paint hazards in the housing.

Purchaser's Acknowledgment (initial)

_____ (c) Purchaser has received copies of all information listed above.

_____ (d) Purchaser has received the pamphlet *Protect Your Family from Lead in Your Home*.

_____ (e) Purchaser has (check one below):

- Received a 10-day opportunity (or mutually agreed upon period) to conduct a risk assessment or inspection for the presence of lead-based paint and/or lead-based paint hazards; or
- Waived the opportunity to conduct a risk assessment or inspection for the presence of lead-based paint and/or lead-based paint hazards.

Agent's Acknowledgment (initial)

_____ (f) Agent has informed the seller of the seller's obligations under 42 USC 4582(d) and is aware of his/her responsibility to ensure compliance.

Certification of Accuracy

The following parties have reviewed the information above and certify, to the best of their knowledge, that the information provided by the signatory is true and accurate.

_____ Seller	_____ Date	_____ Seller	_____ Date
_____ Agent	_____ Date	_____ Agent	_____ Date
_____ Purchaser	_____ Date	_____ Purchaser	_____ Date

Figure G-2. Sample Disclosure Format for Target Housing Sales

Appendix H
Significant Lead Concentrations in Matrices

Matrix	Concentration	Agency	Application	Basis
Paint	1.0 mg/cms ²	HUD	Dried Film - LBP (Abatement)	Technology
	5000 ppm (μg/g) (0.5%)	HUD	Dried Film - LBP (Abatement)	Technology
	<600 ppm (μg/g) (0.6%)	CPSC	Liquid Form - Lead-Free (OK for Residential Application)	Impurity Level
Dust	100 μg/ft ²	EPA	Uncarpeted Floor - Risk Assessment and Clearance	Health
	500 μg/ft ²	EPA	Window Stool (Sill) - Risk Assessment and Clearance	Health
	800 μg/ft ²	EPA	Window Trough - Risk Assessment and Clearance	Health
Water	0 ppb (μg/l)	EPA	Maximum Contaminant Level Goal (MCLG)	Health
	15 ppb (μg/l)	EPA	Public Notice	Health
Potable Water	0.2%	EPA	Solder	Health
	8.0%	EPA	Pipes and Fixtures	Technology

Matrix	Concentration	Agency	Application	Basis
Bare Soil	Areas Expected to be Used by Children 400 - 5000 ppm	EPA	Public Notice. Interim Controls (Change Use Patterns and Provide Barriers for Children)	Health
Air	1.5 $\mu\text{g}/\text{m}^3$ 30 $\mu\text{g}/\text{m}^3$ 50 $\mu\text{g}/\text{m}^3$	EPA OSHA OSHA	Quarterly Time Weighted Average (TWA) Action Level (8-Hour TWA) Permissible Exposure Level (8-Hour TWA)	Air Quality Health Health
Solid Waste	5 ppm Leachable Lead	EPA	Hazardous Waste Characterization	Environment
Blood	10 $\mu\text{g}/\text{dl}$ 40 $\mu\text{g}/\text{dl}$ 50 $\mu\text{g}/\text{dl}$	CDC OSHA OSHA	Child Goal Worker Return to Work Level Worker Medical Removal Level	Health Health Health
Ceramic or Pottery Glasses	3 ppm 2 ppm 1 ppm 0.5 ppm	FDA FDA FDA FDA	Plates, Saucers, and Flatware Small Hollow-Ware (Cereal Bowls) Large Hollow-Ware Cups, Mugs, and Pitchers	Health Health Health Health

Note: State and local regulations may establish more stringent concentrations of lead in matrices.

Glossary

Section I Abbreviations

ACSIM
Assistant Chief of Staff for Installation Management

AEHA
U.S. Army Environmental Hygiene Agency

AR
Army Regulation

ASTM
American Society for Testing and Materials

BRAC
Base Realignment and Closure

CDC
Centers for Disease Control

CERCLA
Comprehensive Environmental Response, Compensation, and Liability Act

CFR
Code of Federal Regulations

CHPPM
U.S. Army Center for Health Promotion and Preventive Medicine

CLLP
Childhood Lead Poisoning Prevention (Program)

CPSC
U.S. Consumer Product Safety Commission

DA
Department of the Army

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EBL
elevated blood lead

EPA
U.S. Environmental Protection Agency

EPR
Environmental Program Requirement Report

FDA
Food and Drug Administration

HUD
U.S. Department of Housing and Urban Development

HW
hazardous waste

ISR
Installation Status Report

LBP
Lead-based paint

MACOM(s)
major Army command(s)

MCLG
maximum contaminant level goal

mg/cm²
milligram per square centimeter

NLLAP
National Lead Laboratory Accreditation Program

OSHA
Occupational, Safety, and Health Administration

ppb
parts per billion

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ppm
parts per million

PWTB
Public Works Technical Bulletin

RCRA
Resource Conservation Recovery Act

TWA
time weighted average

µg/g
microgram per gram

µg/ft²
microgram per square foot

µg/l
microgram per liter

µg/m³
microgram per cubed meter

µg/dl
microgram per deciliter

XRF
x-Ray fluorescence

Section II

Terms

abatement

Any measure or set of measures designed to permanently eliminate lead-based paint hazards. Abatement strategies include the removal of lead-based paint and lead-contaminated dust, the permanent enclosure or encapsulation of lead-based paint, the replacement of lead-painted surfaces or fixtures, and the removal or covering of lead-contaminated soil: and all preparation, cleanup, disposal, and post-abatement clearance testing activities associated with such measures.

accessible surface

Any protruding interior or exterior surface, such as an interior window sill, that a young child can mouth or chew.

accredited training program

A training program that has been accredited by EPA pursuant to § 745.225 to provide training for individuals engaged in lead-based paint activities.

bare soil

Soil not covered with grass, sod, some other similar vegetation, or paving, including the sand in sandboxes.

base realignment and closure (BRAC)

A process directed by Federal law to mandate closure, consolidation, and realignment of defense installations.

child-occupied facilities

Child occupied facilities are buildings, or portions of buildings, constructed prior to 1978, visited regularly by the same child, six years of age or under, on at least two different days within any week, provided that each day's visit lasts at least three hours and the combined weekly visit lasts at least six hours and the combined annual visits last at least 60 hours. Child-occupied facilities may include, but are not limited to, day-care centers, pre-schools, kindergarten classrooms, and family child care homes.

containment

Containment is a process to protect workers and the environment by controlling exposures to the lead-contaminated dust and debris created during abatement.

deteriorated paint

Deteriorated paint is paint that is cracking, flaking, chipping, peeling, or otherwise separating from the substrate of a building component.

disposal (of hazardous waste)

The discharge, deposit, injection, dumping, spilling, leaking, or placement of solid or hazardous waste on land or in water so that none of its constituents can pollute the environment by being emitted into the air or discharged into a body of water, including groundwater.

elevated blood lead (EBL), child

Excessive absorption of lead that is a confirmed concentration of lead in whole blood of 20 µg/dl (micrograms of lead per deciliter of whole blood) for a single venous test or of 15-19 µg/dl in two consecutive tests taken 3 to 4 months apart.

encapsulation

Encapsulation is the application of an encapsulant that forms a barrier between lead-based paint and the environment using a liquid-applied coating (with or without reinforcement materials) or an adhesively bonded covering material.

enclosure

Enclosure is the use of rigid, durable construction materials that are mechanically fastened to the substrate to act as a barrier between the lead-based paint and the environment.

Environmental Program Requirement (EPR) Report

A report used to plan, program, budget, and forecast costs to manage the environment, to practice good environmental stewardship, and to attain and maintain compliance with existing and pending Federal, state, and local environmental laws and regulations. It is used to shop past accomplishments and expenditures; to indicate the status of current projects; to refine and validate requirements for the budget year; and to support planning, programming and budgeting for the outyears to build the Program Objective Memorandum. The EPR Report satisfies the Army's reporting requirements identified in Executive Order 12088 and Office of Management and Budget Circulars A-106 and A-11.

family child care home

An authorized family housing unit, other than the child's home, in which a family member provides child care to one or more unrelated children on a regular basis.

friction surface

Any interior or exterior surface, such as a window or stair tread, subject to abrasion or friction.

hazardous waste

Hazardous waste is a solid waste, not specifically excluded from the restrictions of Federal regulations, that meets the criteria listed in 40 CFR part 261 or is specifically named as a hazardous waste in Federal regulations. For lead-based paint abatement waste, hazardous waste is waste that contains more than 5 ppm of leachable lead as determined by the TCLP test, or is

waste that is corrosive, ignitable, or reactive and not otherwise excluded.

interim controls

A set of measures designed to temporarily reduce human exposure or possible exposure to lead-based paint hazards. Such measures include specialized cleaning, repairs, maintenance, painting, temporary containment, and management and resident education programs. Monitoring, conducted by owners, and reevaluations, conducted by professionals, are integral elements of interim control. Interim controls include dust removal; paint film stabilization; treatment of friction and impact surfaces; installation of soil coverings, such as grass or sod; and land-use controls.

investigation (pertaining to EBL case)

The process of determining the source of lead exposure for a child or other resident with elevated blood lead level. Investigation consists of administration of a questionnaire, comprehensive environmental sampling, case management, and other measures as directed by the installation medical authority.

lead

Lead includes metallic lead and inorganic or organic compounds of lead.

lead-based paint

Paint or other surface coatings that contain lead equal to or in excess of 1.0 milligrams per square centimeter or more than 0.5 percent by weight (5,000 ppm).

lead hazard

Any condition that causes exposure to lead from lead-contaminated dust, lead-contaminated soil, or lead-contaminated paint that is deteriorated or present on accessible surfaces, friction surfaces, or impact surfaces that would result in adverse human health effects. Lead hazards identified through risk assessments are referred to by HUD and EPA as lead-based paint hazards.

lead hazard screen

A type of risk assessment performed only in buildings in good condition using fewer samples but more stringent evaluation criteria (standards) to determine lead hazards.

lead-containing material

Materials that contain any detectable amount of lead as measured, using a valid detection method, for the presence of lead.

lead-contaminated dust

Surface dust in residential dwellings, or child-occupied facilities that contains an area or mass concentration of lead at or in excess of levels identified by EPA.

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lead-contaminated soil

Bare soil on residential real property and on the property of a child-occupied facility that contains lead in excess of levels identified by EPA.

ongoing monitoring inspections

In lead hazard control work, the combination of a visual assessment and collection of environmental samples performed by a certified risk assessor to determine if a previously implemented lead-based paint hazard control measure is still effective and if the dwelling remains lead-safe.

paint in poor condition

More than 10 square feet of deteriorated paint on exterior components with large surface areas; or more than 2 square feet of deteriorated paint on interior components with large surface areas (e.g., walls, ceilings, floors, doors); or more than 10 percent of the total surface area of the component is deteriorated on interior and exterior components with small surface areas (window sills, baseboards, soffits, trim).

paint inspection

A surface-by-surface investigation to determine the presence and location of lead-based paint and a report of the results.

permanently covered soil

Soil which has been separated from human contact by the placement of a barrier consisting of solid, relatively impermeable materials, such as pavement or concrete. Grass, mulch, and other landscaping materials are not considered permanent coverings.

risk assessment

(1) An on-site investigation to determine the existence, nature, severity, and location of lead-based paint hazards, and (2) the provision of a report by the individual or the firm conducting the risk assessment, explaining the results of the investigation and options for reducing lead-based paint hazards.

solid waste

Any garbage, refuse, or sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility. It includes other discarded material such as solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities. The term does not include solid or dissolved material in domestic sewage, solid or dissolved materials in irrigation return flows, industrial discharges which are point sources subject to permits under the Clean Water Act, or special nuclear or byproduct material as defined by the Atomic Energy Act of 1954.

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target housing

Any housing constructed prior to 1978, except housing for the elderly or persons with disabilities (unless any one or more children under 6 years of age resides or is expected to reside in such housing for the elderly or persons with disabilities).

toxicity characteristic leaching procedure

A laboratory test to determine if excessive levels of lead or other hazardous materials could leach from a sample into groundwater; usually used to determine if waste is hazardous based on its toxicity characteristics.

visual inspection for clearance testing

The visual examination of a residential dwelling or a child-occupied facility following an abatement to determine whether or not the abatement has been successfully completed.

Whole-Neighborhood Revitalization

The Department of the Army has established a Whole-Neighborhood Revitalization Program to identify the required work and to provide a systematic approach to accomplishing improvement, repair, and deferred maintenance concurrently. The objective of the Whole-Neighborhood Revitalization Program is to upgrade family housing to a level comparable to new construction standards for energy efficiency, life safety, habitability, durability, and functional requirements while simultaneously improving neighborhood amenities and support facilities.

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