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Standard Guide for Conducting Lead Hazard Assessments of Dwellings and of Other Child-Occupied Facilities[1]

This standard is issued under the fixed designation E2115; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide covers how to conduct, document, and report findings of a lead hazard assessment of dwellings and of other child-occupied facilities.

1.2 Procedures for assessment of personal items, such as toys, dishes, and hobby materials that may contribute to elevated lead levels in blood are not included in this guide.

1.3 Procedures for random sampling of units within dwellings having multiple units are not included.

1.4 This guide contains notes, which are explanatory, and are not part of the mandatory requirements of this guide.

1.5 The values stated in SI units are to be regarded as the standard.

1.5.1 *Exception*—The inch-pound and SI units shown for wipe sampling data are to be individually regarded as standard for wipe sampling data.

1.6 *Methods described in this guide may not meet or be allowed by requirements or regulations established by local authorities having jurisdiction. It is the responsibility of the user of this standard to comply with all such requirements and regulations.*

1.7 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.8 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1356 Terminology Relating to Sampling and Analysis of Atmospheres

D4840 Guide for Sample Chain-of-Custody Procedures

E631 Terminology of Building Constructions

E1583 Practice for Evaluating Laboratories Engaged in Determination of Lead in Paint, Dust, Airborne Particulates, and Soil Taken From and Around Buildings and Related Structures

E1605 Terminology Relating to Lead in Buildings

E1613 Test Method for Determination of Lead by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES), Flame Atomic Absorption Spectrometry (FAAS), or Graphite Furnace Atomic Absorption Spectrometry (GFAAS) Techniques (Withdrawn 2021)[3]

E1644 Practice for Hot Plate Digestion of Dust Wipe Samples for the Determination of Lead

E1645 Practice for Preparation of Dried Paint Samples by Hotplate or Microwave Digestion for Subsequent Lead Analysis

E1726 Practice for Preparation of Soil Samples by Hotplate Digestion for Subsequent Lead Analysis

E1727 Practice for Field Collection of Soil Samples for Subsequent Lead Determination

E1728/E1728M Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Lead Determination

E1729 Practice for Field Collection of Dried Paint Samples for Subsequent Lead Determination

E1753 Practice for Use of Qualitative Chemical Spot Test Kits for Detection of Lead in Dry Paint Films

E1979 Practice for Ultrasonic Extraction of Paint, Dust, Soil, and Air Samples for Subsequent Determination of Lead

E2051 Practice for the Determination of Lead in Paint,

[1] This guide is under the jurisdiction of ASTM Committee D22 on Air Quality and is the direct responsibility of Subcommittee D22.12 on Sampling and Analysis of Lead for Exposure and Risk Assessment.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The last approved version of this historical standard is referenced on www.astm.org.

Settled Dust, Soil and Air Particulate by Field-Portable Electroanalysis (Withdrawn 2010)[3]
E2119 Practice for Quality Systems for Conducting In Situ Measurements of Lead Content in Paint or Other Coatings Using Field-Portable X-Ray Fluorescence (XRF) Devices
E2239 Practice for Record Keeping and Record Preservation for Lead Hazard Activities
E2252 Practice for Selection of Lead Hazard Reduction Methods for Identified Risks in Residential Housing or Child Occupied Facilities
E2255/E2255M Practice for Conducting Visual Assessments for Lead Hazards in Buildings
E3193 Test Method for Measurement of Lead (Pb) in Dust by Wipe, Paint, and Soil by Flame Atomic Absorption Spectrophotometry (FAAS)
E3203 Test Method for Determination of Lead in Dried Paint, Soil, and Wipe Samples by Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES)

2.2 *Other Documents:*

40 CFR 745 Environmental Protection Agency (EPA), Lead-Based Paint Poisoning Prevention in Certain Residential Structures (especially subparts D, L, and Q)[4]
HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, 2nd Edition, July 2012[5]

3. Terminology

3.1 *Definitions*—For definition of terms not appearing here, refer to Terminologies D1356, E631, and E1605.

3.1.1 *lead hazard assessment, n*—an investigation of buildings and associated areas in the immediate vicinity of the buildings conducted to determine the location, type, and severity of lead hazards.

4. Summary of Guide

4.1 This guide discusses the conduct of a lead hazard assessment, in a stepwise progression, using a systematic application of the three general tasks listed below. Simultaneous conduct of several activities within these tasks generally is performed.

4.1.1 *Task 1*—Pre-site visit activities: Preparing for the on-site visit.

4.1.2 *Task 2*—On-site activities: Conducting field work.

4.1.3 *Task 3*—Post-site visit activities: Analyzing information and reporting.

NOTE 1—The procedures described in this guide are based on the hazard identification portion of a risk assessment of dwellings and other facilities frequented by children as described in 40 CFR 745 and the HUD Guidelines.

5. Significance and Use

5.1 This guide is intended to help prevent lead poisoning of children by providing standardized procedures for conducting a lead hazard assessment and providing information needed to develop and recommend lead hazard control options as described in Practice E2252.

5.2 This guide is applicable for use in either occupied or unoccupied dwellings and in other child-occupied facilities.

5.3 The procedures in this guide, when supplemented by recommendations for controlling lead hazards, provide for the conduct of a lead risk assessment of a dwelling or of other child-occupied facilities.

5.4 This guide may be used to supplement assessment procedures used to determine the causes of elevated blood lead (EBL) levels in young children.

NOTE 2—In cases of EBL levels, investigation of the total living environment of the child and a pediatric medical evaluation may also be needed. Reference should be made to documents such as *Managing Elevated Blood Lead Levels Among Young Children*,[6] *Preventing Lead Poisoning in Young Children (1991)*,[7] the HUD Guidelines, and *Screening Young Children for Lead Poisoning (1997)*.[7]

5.5 Although this guide was developed for dwellings and for other child-occupied facilities, this guide may be suitable for lead hazard assessments in non-residential buildings and other properties following agreement between assessor and client on appropriate lead action levels.

5.6 This guide is not intended for use in identifying building materials that when abraded or otherwise degraded, such as that which may occur in remodeling or renovation activities, may result in lead hazards.

5.7 Lead hazard assessment reports describe lead hazards identified at the time the assessment was performed. The locations, types, or severities of lead hazards can change over time as a result of property improvement or deterioration, significant changes in property use, or other factors.

NOTE 3—The term "lead-free" should never be used to describe the absence of lead hazards because testing methodologies are not designed to measure the total absence of lead. Small amounts of lead present in building materials and components or soil may result in a hazard with changes in building conditions or as a result of activities that create dust that contains lead.

5.8 This guide is applicable for assisting professionals, homeowners, owners or occupants of rental property, lenders, insurers, and others with a property interest in determining the presence of lead hazards.

5.9 This guide also is applicable for assisting designers of lead hazard mitigation projects to target resources toward lead hazard controls that are deemed most likely to result in the prevention of lead poisoning in young children.

6. Requirements for a Risk Assessor

6.1 The reliability of a lead hazard assessment depends on the training, experience and knowledge of the lead Risk Assessor. Lead hazard assessments shall be carried out by Risk

[4] Available from U.S. Government Printing Office, Superintendent of Documents, 732 N. Capitol St., NW, Washington, DC 20401-0001, http://www.access.gpo.gov.

[5] Available from U.S. Department of Housing and Urban Development (HUD), 451 7th Street, SW, Washington DC 20410, https://www.hud.gov.

[6] Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention, Centers for Disease Control and Prevention (CDC), March 2002. Available from Centers for Disease Control & Prevention (CDC), 1600 Clifton Rd., Atlanta, GA 30329-4027, http://www.cdc.gov.

[7] Available from Centers for Disease Control and Prevention (CDC), 1600 Clifton Rd., Atlanta, GA 30329-4027, http://www.cdc.gov.

Assessors qualified as required through certification or licensing by applicable regulations promulgated by authorities having jurisdiction.

7. Conducting a Lead Hazard Assessment

7.1 Lead hazard assessments are conducted using a systematic approach consisting of a series of activities within three general tasks. Although several of the activities within a task may be conducted simultaneously in this guide, they are discussed in a stepwise progression.

Task 1—Pre-site visit activities: Preparing for the on-site visit
- Prepare a specifications document
- Gather property information
- Prepare property profile
- Acquire releases
- Assemble assessment supplies
- Determine and document qualifications of personnel and laboratories
- Prepare summary of collected information

Task 2—On-site activities: Conducting field work
- Conduct visual inspection
- Review collected information
- Conduct personal interviews
- Summarize information
- Make decision either to conduct environmental testing or to assume presence of lead above action levels
- Conduct environmental testing

Task 3—Post-site visit activities: Analyzing information and reporting
- Process collected environmental samples
- Identify lead hazards
- Catalog lead hazards
- Prepare a Lead Hazard Assessment Summary
- Prepare a Lead Hazard Assessment Report

7.2 When applicable, ensure that all requirements of regulations promulgated by authorities having jurisdiction for conduct of a lead hazard assessment are met. Consideration should favor the application of the more stringent regulation, if more than one applies.

8. Task 1—Pre-Site Visit Activities: Preparing for the On-Site Visit

8.1 *Prepare a Specification Document*—For most lead hazard assessments performed for compensation, a specification document serves to define the scope of work and is used in the contract between the Risk Assessor and the client (see Note 4). Otherwise, it serves to define the scope of work for use in a project plan, for example, for staff work assignments. This document, at a minimum, should include:

NOTE 4—In most cases, this document will be generated from boilerplate materials that are modified as needed to fit the conditions and requirements of the specific site being assessed, as agreed upon by the client and assessor. It may or may not include approvals by the client or contingencies regarding the successful receipt of signed releases for information gathering from the client and occupants.

8.1.1 *Scope*—A description of the work to be performed including a description of the area to be assessed and the minimum number and types of environmental tests (for example, paint, dust, and soil) to be performed during the assessment.

NOTE 5—Some geographical areas are susceptible to lead contamination in water. Visual inspection of plumbing for the presence of potentially leaded components is generally believed to be unproductive beyond a general assessment regarding whether older or modern materials appear to have been used. It is recommended practice for a lead Risk Assessor to inform the client that collection of water may be of value should older plumbing materials be observed during the visual inspection, particularly if the site is located in a susceptible geographic area. Agreement between the assessor and client should be reached regarding water sampling. A first-draw sample that collects water that has remained in the plumbing system undisturbed overnight may be needed. To collect this sample, either the Risk Assessor must obtain access to the site before the occupants use water for that day or provide the occupants with instructions and materials to collect a first-draw sample themselves.

8.1.2 *Cost*—The cost for conducting the work, if the lead hazard assessment is performed for compensation.

8.1.3 *Regulatory Requirements*—A summary of the applicable regulatory requirements for the lead hazard assessments and subsequent hazard mitigation procedures for the area and structures being assessed including identification of the regulatory agencies having jurisdiction.

8.1.3.1 Include regulatory lead action levels promulgated by authorities having jurisdiction, as appropriate.

8.1.3.2 Action levels more stringent than those promulgated by the authorities having jurisdiction may be used following agreement between assessor and client.

8.1.3.3 In the absence of action levels in regulations by authorities having jurisdiction, agreement between assessor and client shall be addressed prior to field work.

8.1.4 *Personnel Qualifications*—A summary of the qualifications required for conduct of a lead hazard assessment as prescribed in regulations promulgated by authorities having jurisdiction.

8.1.5 *Laboratory Qualifications*—Laboratories analyzing samples obtained during the assessment of lead hazards from buildings or other child occupied facilities shall conform to Practice E1583, or shall be recognized for lead analysis as promulgated by authorities having jurisdiction, or both.

NOTE 6—The United States of America requires that all laboratories used for analysis of samples from dwellings and other child occupied facilities shall be recognized as capable of such analyses under the Environmental Protection Agency (EPA) National Lead Laboratory Accreditation Program (NLLAP).

8.2 *Gather Property Information*—Acquire background information on the building to be assessed, as feasible, from the client or occupants, such as:

8.2.1 Building construction or structural records including construction date,

8.2.2 Existing floor plans,

8.2.3 Past property usage records,

8.2.4 Home inspection records,

8.2.5 Any appropriate existing environmental testing records such as a lead hazard or risk assessment, lead-based paint inspection, or other lead or lead hazard testing,

8.2.6 A statement as to the current general use of the structure,

8.2.7 The number of occupants, and the approximate ages of children, if any, and

8.2.8 Any exposure related records from the occupants of the structure.

8.3 *Prepare a Property Profile*—Include in the profile, if feasible:

8.3.1 Name and address of client, and relationship to property (owner, buyer, tenant, lender, insurer, and so forth),

8.3.2 Address of property assessed,

8.3.3 Description of the property assessed (home, apartment, commercial structure, and so forth),

8.3.4 Age of property,

8.3.5 Past, current, or planned renovations or repainting,

8.3.6 Existing lead testing, or inspection reports or previous Lead Hazard Assessment Reports, or a combination thereof,

8.3.7 Incidents of lead poisoning in the property,

8.3.8 Repair or maintenance work orders of activity recently carried out, and

8.3.9 Other information on sources of lead in the property.

8.4 *Acquire Releases*—Acquire signed permission releases needed to enter the property to conduct the lead hazard assessment, as necessary. Examples of such releases include:

8.4.1 Permission to enter the property,

8.4.2 Permission to acquire and review available property construction records, inspection records, previous lead hazard assessment or risk assessment records, and any other records appropriate to the conduct of the lead hazard assessment,

8.4.3 Permission to conduct dust sampling, soil sampling, in situ paint testing, water sampling, and any intrusive paint chip sampling deemed necessary or appropriate, and

8.4.4 Permission to conduct interviews of the client, the client's personnel, and of occupants, as appropriate.

8.5 *Assemble Assessment Supplies*—Assemble, inventory, and pack for shipment to the assessment site testing and sampling materials and protocols that may be needed during the lead hazard assessment.

8.6 *Determine and Document Qualifications of Personnel and Laboratories:*

8.6.1 Document that all personnel to be involved in the assessment meet the requirements in 8.1.4. Include in the documentation copies of appropriate licenses and certifications.

8.6.2 Document that all laboratories to be used for analysis of environmental samples meet the requirements in 8.1.5. Include in the documentation copies of appropriate licenses and certifications. See Note 6.

8.7 *Prepare Summary of Collected Information*—Review all the information obtained and prepare a summary to use in making decisions during the on-site visit. Attach signed permission releases to the summary for quick reference. At a minimum, the summary should list physical locations targeted for environmental testing.

9. Task 2—On-Site Activities: Conducting Field Work

9.1 *General Conduct of Field Work:*

9.2 *Conduct Visual Inspection*—Conduct a visual inspection of the area to be assessed in accordance with Practice E2255/E2255M to identify suspected lead hazards.

9.2.1 Ensure that each potential friction surface (for example, sash and sill of a double hung operable window, jamb or frame of a door, and painted floor or stair tread) is assessed for evidence of abrasion.

9.2.2 Ensure that each potential impact surface (for example, door and door jamb) is assessed for damaged paint.

9.2.3 Ensure that each potential chewable surface (for example, interior window sill) is assessed for damaged paint.

9.3 *Review Collected Information*—Review and summarize the visual assessment data and previously collected information to provide an improved frame of reference for conducting personal interviews.

9.4 *Conduct Personal Interviews*—Personal interviews with the occupants of the dwelling or with occupants of other child-occupied facilities are recommended to better understand the use and use patterns of the dwelling or facility being assessed. If personal interviews with the occupants cannot be conducted, then, if possible, conduct interviews with persons familiar with the dwelling or facility to be assessed, such as the owner, previous occupants, neighbors, or maintenance personnel. If interviews are not possible, use professional judgment to make assumptions regarding children's use or use patterns with respect to both interior and exterior areas. The use pattern information is used in assigning a potential lead-risk hazard category to each item identified as a lead hazard.

9.4.1 *Interview Questions*—Attempt to get answers to as many of the questions shown in Table 1 as possible. Table 1 is not an exhaustive list and should be supplemented with additional questions deemed necessary to provide useful information regarding the use and use patterns of the building. Use of pre-configured interview questionnaire forms with columns provided to record answers and other observations can provide a convenient method of recording interview data minimizing the need for extensive writing during the next review and summarization step.

9.5 *Summarize Information*—Summarize all interview and other previously collected information to assist in determining living areas and locations within the living areas for environmental testing.

9.5.1 Note on the floor or site plan the potential hazards that residents may frequently contact based on use patterns for suitable locations for environmental testing.

9.6 *Make Decision either to Conduct Environmental Testing or to Assume Presence of Lead above Action Levels:*

9.6.1 For suspected lead hazards listed in the paint/dust/debris or ground data forms, an assumption that lead is present above the applicable regulatory action level may be made with the permission of the client. However, environmental testing is needed to determine the absence of lead hazards.

9.6.2 If lead hazards are assumed to be present, go to 10.4.

9.7 *Conduct Environmental Testing*—Determine whether the testing guidelines given in this section meet the requirements of regulations promulgated by authorities having jurisdiction. If not, make appropriate changes to the guidelines given. Also consider testing areas that potentially represent the greatest lead risks as identified in 9.5.1. This approach to sampling provides for the potential identification of worst-case situations as opposed to a sampling design having an objective of identifying average situations.

NOTE 7—In the United States of America, some jurisdictions allow composite wipe samples from different rooms, citing an EPA regulation that expressly permits such samples. Other jurisdictions may not allow such samples. In composite sampling discussed here, the number of wipe samples collected remains the same, but two or more dust wipes from equal sized areas in different rooms are combined for single analysis. This guide does not include procedures for such use. See the HUD Guidelines,

TABLE 1 Standard Interview Questions

Category	Question
Demographic	Do you have any children? Are any children living here? What are their ages? Have any of the children had an elevated blood lead level?
Behavior	Do any children often put their hands into their mouths? Do any children often put non-food items into their mouths? Do any children tend to mouth any painted surfaces, such as window sills, furniture or toys?
Housing conditions	(Other than what was observed) are you aware of any deteriorated paint, any paint that is being abraded, or any painted surfaces subject to impact? Has any paint, dust, soil, water or other media been tested? Tested for lead? Do you have the results? Are you aware of any plumbing or roof leaks or other moisture penetration into the home? Are there any signs of paint chips in the exterior soil? Are there any window air conditioners or any windows that may have previously had a window air conditioner? Are there any other painted structures on property—for example, garage, shed, fence? What is the condition of gutters and down spouts? Where do down spouts drain? Are there any downspout drains that go underground and exit somewhere else in the yard? Does the house have a forced air system? Is there any outside play equipment? Do you have city water or a well? Has your water been tested (any parameters)? Do you have the results? Are any of your windows sealed or painted shut? What is the condition of neighboring property? Any recent renovations there?
Structure utilization by children	Where do the children sleep, eat, play (indoors and out)? Where are toys stored/kept? Do any children spend a lot of time at another residence, such as a day care center, etc.? Do you have any pets? Where do they sleep, both indoors and out? Do any children frequently play with the pet?

Appendix 13.1, if planning to conduct this type of composite dust wipe sampling.

9.7.1 *Select Living Areas for Paint and Dust Testing*—In the dwelling or facility to be assessed, select:

9.7.1.1 All, or a minimum of four, living areas that children under six are most likely to frequent,

9.7.1.2 Each additional living area with deteriorated paint that was identified in the visual assessment, and

9.7.1.3 In addition for dust, at each entryway from the exterior of the dwelling or facility.

9.7.2 *Identify Locations for Paint Sampling and Testing*—Identify a location(s) in each living area for each surface appearing to have a unique painting history in each of the following categories that apply:

9.7.2.1 Painted surfaces subject to friction, for example, windows, doors, and painted floors or stairs,

9.7.2.2 Painted surfaces subject to impact, for example, door frames,

9.7.2.3 Painted surface on which there is evidence of teeth marks, and

9.7.2.4 Painted surfaces having deteriorated paint that were not included above.

9.7.3 *Identify Sampling Locations for Surface Dust*—Identify a location(s) in each living area in each of the following categories that apply:

9.7.3.1 A minimum of one interior window sill in each living area.

9.7.3.2 Floor in every living area and entryway.

9.7.3.3 Horizontal surfaces directly beneath painted surfaces deteriorated by friction or impact. In cases where more than one painted surface is deteriorated by friction or impact in the living area, select representative horizontal surfaces using professional judgment.

9.7.3.4 All other horizontal surface(s) subject to friction, for example, stair treads.

9.7.4 *Identify Sampling Locations for Soil*—Determine locations in:

9.7.4.1 Each exterior play areas where bare soil is present,

9.7.4.2 Other yard locations with bare soil, and

9.7.4.3 Dwelling or facility roof dripline area where bare soil is present.

9.7.5 *Testing and Sampling for Paint Hazards*—Decisions regarding paint hazards can be supported using either results of appropriate on-site testing methods or field-operational or fixed-site laboratory analyses following sample collection or a combination of the two. See Note 6.

9.7.5.1 Use Practices E1753, or E2051, or E2119, or a combination thereof, in making on-site lead determinations as appropriate.[8] See Note 6.

9.7.5.2 Collect paint samples for laboratory analyses in accordance with Practice E1729. See Note 6.

9.7.6 *Sampling and Testing for Surface Dust Hazards:*

[8] OSHA Method OSS1, "Lead on Surfaces by Portable XRF," 2003, available from Occupational Safety and Health Administration (OSHA), 200 Constitution Ave., NW, Washington, DC 20210, http://www.osha.gov.

9.7.6.1 Collect all surface dust samples in accordance with Practice E1728/E1728M.

9.7.6.2 Analyze dust-wipe samples to determine the lead content. When using ultrasonic extraction and field portable electroanalysis (see Practice E2051), use only wipes that have been shown to be suitable for these procedures. Other procedures that can be considered include the use of portable XRF to measure lead in dust-wipes.[8, 9] See Note 6.

9.7.7 *Sampling and Testing for Soil Hazards:*

9.7.7.1 Collect all soil samples in accordance with Practice E1727.

9.7.7.2 Analyze soil samples using a laboratory to determine lead content. On-site field-portable electroanlysis shall be conducted according to Practice E2051. Other procedures that can be considered include the use of portable XRF to measure lead in soil samples. See Note 6.

10. Task 3—Post-Site Visit Activities: Analyzing Information and Reporting

10.1 *Process Collected Environmental Samples:*

10.1.1 Assure that each sample container is labeled with a unique sample identifier.

10.1.2 Initiate a chain-of-custody record in accordance with Guide D4840 for collected paint, surface dust, and soil samples. The chain-of-custody form shall include:

10.1.2.1 Unique sample identifiers,

10.1.2.2 Date of collection,

10.1.2.3 The dimensions of the areas from which paint samples or dust-wipe samples were collected, and

10.1.2.4 The dates of assumption and relinquishment of custody for each person who collected the samples and for each person or company/organization that obtains custody of any or all of the samples, at least the name(s) of the person(s).

10.1.3 Submit all samples to laboratories that meet 8.1.5. See Note 6.

10.1.4 Request that each laboratory provide a copy of their certificate(s) that recognizes that the laboratory meets the regulatory requirements of the authorities having jurisdiction. Verify that the laboratory's scope of accreditation includes the testing to be performed.

10.1.5 Request that each laboratory provide other information developed by the laboratory as specified in their quality system (for example, such as required in the United States of America by the EPA NLLAP).

10.1.6 Request laboratories analyze collected samples using Test Methods E1613, E3193, or E3203 or Practices E1644, E1645, E1726, E1979, or E2051.

10.1.7 *Dust-Wipe Samples*—Request that the laboratory provide:

10.1.7.1 Mass (micrograms, µg) of lead found in the sample,

10.1.7.2 The calculated mass of lead per unit area sampled (micrograms of lead per square metre or square foot ($\mu g/m^2$ or $\mu g/ft^2$)), and

10.1.7.3 The method reporting limit (MRL) or reporting limit (RL) in mass (µg) of lead per sample.

10.1.8 *Paint Samples*—Request that the laboratory provide:

10.1.8.1 Mass (micrograms, mg) of lead found in the sample,

10.1.8.2 Micrograms of lead per gram of paint sample, µg/g, if required,

10.1.8.3 The calculated mass of lead per unit area sampled (milligrams of lead per square centimetre (mg/cm^2), and

10.1.8.4 The method reporting limit (MRL) or reporting limit (RL) in mass (mg) of lead per sample.

10.1.9 *Soil Samples*—Request the laboratory report:

10.1.9.1 Micrograms of lead per gram of soil (µg/g), milligrams of lead per kilogram of soil (mg/kg), or parts per million (ppm) for soil, and

10.1.9.2 Method reporting limit (MRL) or reporting limit (RL) in micrograms of lead per gram of soil (µg/g), milligrams of lead per kilogram of soil (mg/kg), or parts per million (ppm) for soil.

10.2 *Identify Lead Hazards:*

10.2.1 For each suspected hazard listed on either the paint/dust/debris or ground data forms, record on the appropriate form the lead content or lead concentration determined by the analysis, including determinations less than the method reporting limit (< MRL) or reporting limit (< RL).

10.2.2 Eliminate as a potential hazard each sample having a lead content or lead concentration below the method reporting limit (< MRL) or reporting limit (< RL) except for those samples having such a small size that the appropriate action level is less than the MRL or RL.

10.3 *Catalog Lead Hazards:*

NOTE 8—The purpose of this step is to provide information for making recommendations as to the order in which hazard mitigations should be carried out to minimize risks of lead poisoning when available finances are limited. The lead level and physical dimensions of the hazard and the likelihood of individuals coming into contact with the hazard are considered.

10.3.1 Prepare a new form to be entitled the Potential Lead Hazard Risk Rating Form. List on this form all potential lead hazards identified in 10.2 (that is, do not include those eliminated in 10.2.2).

10.3.2 For each potential hazard listed on the Potential Lead Hazard Risk Rating Form, record:

10.3.2.1 The action level in regulations promulgated by authorities having jurisdiction or as agreed upon in 8.1.3 (for example, either the play area or rest-of-yard action level could be used in absence of a dripline area level in regulations promulgated by authorities having jurisdiction).

NOTE 9—In the United States of America, many jurisdictions follow the standards for lead hazards established by the EPA. Under these standards, a dust-lead hazard in a residential unit is determined by comparing the arithmetic mean of the collected dust samples to the applicable standard with appropriate weighting of the mean if composite dust wipe samples are collected. Soil-lead hazards in play areas and in the rest of the yard are determined by comparison of a composite soil sample or arithmetic mean of composite soils samples to the applicable standard for play areas or the rest of the yard.

10.3.2.2 The determined lead content or lead concentration.

10.3.2.3 All the descriptive information from either the paint/dust/debris or ground data form, including for paint a

[9] Harper, M., Hallmark, T. S., and Bartolucci, A. A., "A Comparison of Methods and Materials for the Analysis of Leaded Wipes," *Journal of Environmental Monitoring*, Vol 4, 2002, pp. 1025–1033.

potential cause of deterioration. (Descriptive information includes, sample code(s), the testing location, and observed condition.)

10.3.2.4 The surfaces represented by the sample.

NOTE 10—For painted surfaces, all surfaces assumed to have the same painting history as the surface tested are represented by the paint sample. For dust-testing, a set of floor samples collected in a residence may represent all the floors in that residence, and similarly for other surfaces tested. However, the floor dust sample or samples taken in a room, portion of a room, or room equivalent may represent only the floor in that room, portion of room or room equivalent, and similarly for other surfaces tested. For soil testing, the soil samples taken in the play area may be said to represent all the play area soil, and similarly, for other parts of the yard and other areas tested.

10.3.2.5 Appropriate use or use pattern notes determined during 9.4.

10.3.2.6 Include additional spaces on the form to record an extent-of-hazard rating, a lead level hazard classification, and a potential lead-hazard risk category for each lead hazard (see Table 2).

10.3.3 *Assign Extent-of-Hazard Rating*—For each potential hazard listed on the Potential Lead Hazard Risk Rating Form, assign an extent-of-hazard rating and record on the form.

10.3.3.1 *Deteriorated Paint*—Assign a "major" rating to hazards having an "observed condition" (from the paint/dust debris data form) of ≥2 m^2 (≥20 ft^2) on an exterior building face, ≥0.2 m^2 (≥2 ft^2) on an interior building component, on a room by room basis, or ≥10 percent of the total surface area of a component per unit on an exterior or interior component having small surface area. Assign a "minor" rating for observed conditions having less deterioration than that given above for a "major" rating.

10.3.3.2 *Deteriorated Paint on Friction, Impact and Chewable Surfaces*—Assign a "major" rating to all paint hazards associated with deteriorated paint on friction, impact and chewable surfaces.

10.3.3.3 *Dust*—Assign a "major" rating to all hazards associated with dust.

10.3.3.4 *Soil*—Assign a "major" rating to soil hazards having an "observed condition" from the ground data form of bare soil areas greater than approximately 0.1 m^2 (1 ft^2). Assign a "minor" rating to soil hazards having an observed condition of bare soil areas of less than approximately 0.1 m^2 (1 ft^2).

10.3.4 *Lead Level Hazard Classification*—For each lead hazard listed on the Potential Lead Hazard Risk Rating Form, compare the determined lead content with the appropriate regulatory action level. Classify each hazard into one of the following groups:

10.3.4.1 *Group A*—Lead content is less than the regulatory action level,

10.3.4.2 *Group B*—Lead content is equal to or greater than the action level, but not greater than 5 times the action level, and

10.3.4.3 *Group C*—Lead content is equal to or greater than 5 times the action level.

10.3.5 *Determine Potential Lead-Hazard Risk Rating*—Assign and record a potential lead-hazard risk category, that is, high, moderate, or low, to each hazard according to the guidance shown in Table 2.

10.4 *Prepare a Lead Hazard Assessment Summary*—Use the form entitled, Lead Hazard Assessment Summary, shown in Fig. 1, or an equivalent form, to prepare a summary document for use in reporting potential hazards to clients and recommending hazard mitigations procedures. Attach a copy of the Potential Lead Hazard Risk Rating Form. Record the following:

10.4.1 The complete mailing address for the site evaluated.

10.4.2 The dates when the on-site visit portion of the lead hazard assessment was performed.

10.4.3 An identifier that indicates the lead hazard assessment procedure used to determine the presence or absence of lead hazards. For example, if the guidance presented in this standard was used, then enter the ASTM number for this standard, E2115.

10.4.4 The type of lead hazard, that is paint, dust, soil, and water, that was found. Record for each type of lead hazard:

10.4.4.1 The action level used to make the hazard determination, and

NOTE 11—For example, if the regulations of a jurisdiction in the United States of America define lead-based paint as paint, varnish, stain, or other

TABLE 2 Potential Lead Hazard Categories for Various Identified Conditions

Use Pattern Indicates Frequent Contact with Item?	Extent-of-Hazard Rating	Lead Level Hazard Classification, from 10.3.4	Potential Lead Hazard Risk Category
Yes	Major	Group C	High
		Group B	High
		Group A	Moderate
	Minor	Group C	High
		Group B	Moderate
		Group A	Low
No	Major	Group C	Moderate
		Group B	Moderate
		Group A	Low
	Minor	Group C	Moderate
		Group B	Low
		Group A	Low