JOINT EPA - HUD CURRICULUM

October 2011; Revised March 2021

Model Certified Lead Dust Sampling Technician Training Course

INSTRUCTOR MANUAL

EPA-740-R-09-006

This Course Curriculum

The U.S. Environmental Protection Agency (US EPA) and Office of Housing and Urban Development (HUD) have produced this course to teach individuals how to conduct non-abatement lead dust clearance testing. This course is designed to be taught over an 8-hour time period with 2 hours devoted to hands-on training. For certification purposes, the course can be taught by either an EPA-accredited training provider, or a training provider accredited by an authorized State, Tribe, or Territory.

Objectives for the Course

At the end of the course, students will be able to:

- Understand the Federal, State, and Indian Tribe regulatory requirements for lead dust clearance testing;
- Conduct a visual inspection and correctly identify visible dust, debris, and deteriorated paint;
- Appropriately determine where to take dust samples and how to develop a sampling strategy.
- Collect dust samples in accordance with standard acceptable procedures;
- Interpret the results of a laboratory analysis for lead in dust correctly;
- Apply these skills to conduct an appropriate lead dust clearance test in post-renovation and other circumstances;
- Write a complete, accurate, and understandable report of sampling results.

Audience for the Course

Organizations that will be interested in this course include:

- State and local public agencies that administer Federal funds for housing;
- Non-profit and community housing organizations, particularly those that assist public agencies in administering Federal housing funds;
- State and local health departments;
- Home inspection firms; and
- Lead and other environmental services firms.

Appropriate staff to take this course will include:

- Housing quality standards (HQS) inspectors;
- Rehabilitation specialists;
- Home inspectors; and

- Other staff who are involved in evaluating buildings.

Overview of Lead Dust Sampling Technician Training Curriculum

This training course consists of three parts in the six chapters including:

Part 1: Introduction

- **Chapter 1: Introduction** provides an overview of the course, the role of a lead dust sampling technician, and the relevance of the EPA Renovation, Repair, and Painting (RRP) Rule and HUD's Lead Safe Housing Rule (LSHR).

Part 2: Skills

- **Chapter 2: Visual Inspection** explains how to perform a visual inspection for paint chips, dust and debris and, in some circumstances, deteriorated paint.
- **Chapter 3: Lead Dust Wipe Sampling** describes how to prepare for and collect dust wipe samples.
- **Chapter 4: Selecting a Laboratory and Interpreting Results** describes how to select a recognized lab, how to submit samples, and how to interpret the results.

Part 3: Application

- **Chapter 5: Writing the Report** covers how to prepare the report.
- **Chapter 6: Putting the Skills Together** gives the students an opportunity to put their new skills to the test in a series of desktop and hands on exercises that cover the issues of sample location selection, dust wipe sampling, interpreting laboratory results and writing a dust lead clearance report

Course Materials

Course materials include slides, an instructor manual, a student manual, and a *Lead Dust Sampling Technician Field Guide.*

- **Slides.** Each chapter in this course has slides that highlight key points to be made during the presentation. The slides also include pictures, diagrams, and other visual aids.
- **Instructor Manual.** The instructor manual includes copies of the slides and explanatory text. At the front of each chapter, there are brief instructor notes that describe the chapter objectives, the activities, and additional information if necessary. The back of each chapter includes attachments such as sample documents, exercises, etc. Finally, in the back of the manual there are 3 appendices that contain useful resources for both instructors and students.
- **Student Manual.** The student manual includes everything in the instructor manual except this instructor overview and the instructor notes that appear at the front of every chapter in the instructor manual.

- **Lead Dust Sampling Technician Field Guide.** The Lead Dust Sampling Technician Field Guide provides protocols for conducting post-renovation clearance under EPA's RRP Rule and clearance examinations under HUD's LSHR in housing and child-occupied facilities built before 1978. This guide also provides Federal standards for lead in dust. Refer students to the *Lead Dust Sampling Technician Field Guide* as appropriate.
- In presenting the course, instructors are encouraged to use the student materials in the following ways:
  - Recommend to the students that they follow along with the slides as they are presented and to take notes;
  - Refer students to the attachments and appendices and encourage them to mark pages with specific information, summaries, checklists, tables, or tools they can use; and
  - Refer students to the *Lead Dust Sampling Technician Field Guide* as appropriate.

Instructional Information

Instructor responsibilities. The success of each training session depends upon good preparation and effective delivery of course materials. While this manual provides specific guidance about presenting this course, instructors will need to use their professional expertise and training experience in preparing their lessons and adapting their deliveries to address the needs of students in each session. The key responsibilities of each instructor are to:

- Understand the course material, the relevant EPA and HUD regulations and documented methodologies including Chapter – 15 of the HUD Guidelines for the Identification and Control of Lead-based Paint Hazards in Housing.
- Prepare for each lesson based on the guidance and instructions in the instructor manual;
- Deliver lessons and accomplish objectives within each chapter;
- Make sure that questions from students are answered, or refer them to an appropriate resource; and
- Reinforce course objectives throughout the training session.

Instructional methods. This course is primarily discussion-based; however, it is designed to be interactive. Several of the chapters include exercises and activities. Throughout the presentation, instructors are encouraged to be conversational in tone and solicit student input. The instructor notes highlight some of the appropriate times to prompt students for input. Instructors may modify lesson activities, as long as the learning objectives for the chapter are accomplished, the key points are effectively covered, and the hands-on time is not reduced to less than 2 hours.

Preparing for a training session. Prior to each course delivery, instructors are responsible for making the following preparations:

- Planning the delivery of their lessons;

- Reviewing the participant registration forms to familiarize themselves with the students, their agencies/firms/organizations and positions, and any special issues they have identified;
- Ensuring that the training room is properly set up; and
- Confirming that all the necessary training supplies, materials, and equipment are available at the training site.
- Plan to administer the test. In addition to reinforcing participant learning and helping evaluate their understanding, passing the course test is required to allow each student to become an EPA Certified Lead Dust Sampling Technician. Certification includes successful completion of the training course and end-of-course test. You must develop a test blueprint from the course material and submit it to EPA for approval with the accreditation application.

Instructor's Checklist

Supplies of Materials for the Course
✓ Instructor manual – including notes and attachments
✓ Student manuals – including copies of instructor slides and attachments
✓ *Lead Dust Sampling Technician Field Guide*
✓ Slides
✓ Lead dust sampling materials
- Disposable lead dust wipes (individually wrapped)
- Disposable gloves
- Disposable shoe covers
- Sample tubes with caps
- Reusable or disposable templates (can be made or purchased)*
- Masking or painter's tape
- Ruler (measurements must begin at ruler's edge)
- Sample collection forms
- Chain-of-custody forms
- Markers, trash bags, labels, pens, re-sealable storage bags
- Calculator
- Sanitary wipes
✓ Flipchart and/or blank transparencies for recording additional information

*Instructors should provide samples of floor templates to the students during the course.

Guidance on Conducting Hands-On Activities: Hands-on training is a required element of this curriculum. It is recommended that trainers consider the following factors when planning for and conducting the hands-on training segments:

- Have the right kind of supplies available. Use the lists provided to plan appropriately and bring the right sorts of supplies to the training site. For example, household garbage bags are not equivalent to heavy-duty disposal bags. In addition, knowing the layout of the training room in advance would be helpful in determining whether or not windowsills or troughs can be sampled during the training. If the room does not have a window, then make certain there is a suitable prop resembling a windowsill or trough, like box tops, for example.

- Have supplies in adequate quantities. Depending on how you structure the activity, you may need varying numbers of supplies. For example, if the trainer demonstrates how to seal and gooseneck a disposal bag, you will use one bag. If each student practices this procedure, the training will consume a larger number of bags. Plan ahead so you have enough supplies.

- Have an adequate number of instructors. Depending on the class size, some hands-on activities require more than one instructor to properly supervise and provide feedback. Make sure you have enough trainers available to deliver the course to the number of students attending. This is important because each student will be evaluated individually. The training can be structured so that extra trainers need to be available only during the hands-on activities. It is recommended that, at most, a 6:1 student-to-trainer ratio (i.e., one trainer for every 6 students) for the hands-on exercises be maintained. Even with a 6:1 ratio, trainers should expect to be quite busy during the hands-on exercises.

- Carefully estimate the time you will need to conduct the hands-on exercises. This curriculum contains a large amount of course content. Be mindful of class size and time constraints when planning the hands-on exercises.

- Make sure your equipment is clean and in working order before the class. Test your equipment before the training begins. Trainers must not conduct training with lead-contaminated equipment such as dirty templates, tubes, or gloves.

- The use of actual lead-based paint for training purposes is not allowed. Participants are in your class to learn the skills to be a successful lead dust sampling technician. Should they make a procedural error during training, they should not be placed at risk of being exposed to lead.

- The training facility must be appropriate for this course. For example, some locations prohibit the use of water inside their facility. Know what is required for this course, and what is allowed in the facility to be used. Match course requirements to the facility to be used.

- Coach participants through the hands-on activities and document their proficiency. Hands-on activities in chapters 3, 4 and 6 list specific tasks that each participant must perform correctly

during that activity. Record achievement of these skills in a Participant Progress Log. See page vii of this Instructor Overview for an example Participant Progress Log.

Sample Agenda		
Registration and Introduction (Includes Taking Pictures of Students)	15-minute lecture/discussion	
Chapter 1: Introduction	30-minute lecture	The objective of this chapter is simply to introduce students to the course and cover basic information.
Chapter 2: Visual Inspection	45-minute lecture	The major objective of this chapter is to teach students to perform visual inspections.
Break	15 minutes	
Chapter 3: Lead Dust Wipe Sampling	60-minute lecture 60-minute hands-on activity	The major objective of this chapter is to teach students how to take a lead dust wipe sample.
Lunch	1 hour	
Chapter 4: Selecting a Laboratory and Interpreting Results	45-minute lecture	The major objective of this chapter is to teach students to understand the role of the laboratory and what to look for when they select a laboratory.
Chapter 5: Writing the Report	25-minute lecture	This chapter will teach students how to complete and deliver reports of their lead dust clearance tests.
Break	15 minutes	
Chapter 6: Putting the Skills Together	45-minute lecture 75- minute hands-on activity	This chapter is designed to help students apply all of the information they have been given in a hands-on activity.
Review	15 minutes	Take this time to review any last minute questions before the test.
Test	30 minutes	

Sample - Participant Progress Log – Sample
Hands-on Activities

Name of Trainee	**Chapter 3 Activity:** Let's Try It	**Chapter 4 Activity:** Interpreting Laboratory Results	**Chapter 6 Activity 1:** Where To Take Samples	**Chapter 6 Activity 2:** Dust Wipe Sampling	**Chapter 6 Activity 3:** Interpreting the Results	**Chapter 6 Activity 4:** Translating Results into a Written Report

Chapter 1: Introduction

INSTRUCTOR NOTES **CHAPTER 1: INTRODUCTION**

Objectives:	The objective of this chapter is to introduce students to the course and cover basic information. At the end of this chapter students will know: • Course objectives • Basic information on lead and lead in dust and debris • The role of a lead dust sampling technician • How this course relates to the lead-based paint inspector and risk assessor courses • The EPA RRP Rule's requirements related to clearance sampling and cleaning verification • HUD clearance requirements for non-abatement jobs
Introduction to this chapter:	This is the first chapter of the course. It outlines the course objectives, provides basic information about the class, and provides an overview of the lead-dust sampling technician's role and responsibilities.
Activities:	Introductions: On **Slide 1-3,** ask students to identify themselves and the organization they work with and tell how their work involves lead-based paint.
Review:	This chapter has no review.
Notes:	This chapter simply sets the stage for the rest of the course. The requirements for the HUD and EPA rule's can be complicated and may require extra time. Be sure to point out **Attachment 1-A: Comparing Lead Evaluation Professionals,** which describes the differences in capacity and responsibility of lead dust sampling technicians, lead-based paint inspectors, and risk assessors.

Chapter 1

Introduction

Lead Dust Sampling Technician
October 2011

Welcome to the Lead Dust Sampling Technician Training Course.

1-2

Course Objectives

- Understand what a lead-dust clearance test is.
- Identify steps in lead-dust clearance testing.
- Learn how to:
  - Conduct a visual inspection
  - Collect lead dust samples
  - Interpret results
  - Write a report
  - Explain the results to the client

Lead Dust Sampling Technician
October 2011

The EPA has provided this model curriculum to teach individuals how to conduct lead dust clearance testing after renovation activities.
Lead dust clearance testing is often performed to find out whether lead dust remains after renovation, repair, or painting. It is required by HUD's LSHR regulations for most renovations. By the end of the course, students will be able to perform the actions listed above.

Introduce Yourself

- Name
- Occupation/organization
- How does your work involve lead-based paint?

Overview of Student Materials

- Student Manual
- Attachments
- Appendices
- *Lead Dust Sampling Technician Field Guide*

Lead Dust Sampling Technician
October 2011

The student materials include a student manual, attachments, appendices, and a copy of the *Lead Dust Sampling Technician Field Guide*.

- The student manual contains copies of the slides that are used by the instructor during the course.
- The attachments and appendices provide important summaries, checklists, tables, and tools you can use.
- The *Lead Dust Sampling Technician Field Guide* outlines key points and procedures in one easy-to-read reference tool that can be taken along on the job.

1-5

Health Risks of Lead

- In children:
  - Damage to the brain and central nervous system; can cause decreased intelligence, reading and learning difficulties, behavioral problems, and hyperactivity.
  - Damage can be irreversible, affecting children throughout their lives.
- In pregnant women:
  - Damage to the fetus

Lead Dust Sampling Technician
October 2011

Children under 6 are most at risk from small amounts of lead.
Children are at a greater risk than adults. During normal and frequent playing or hand-to-mouth activity, children may swallow or inhale lead dust from their hands, toys, food, or other objects.
In children, lead may cause:

- Nervous system and kidney damage
- Decreased intelligence, attention deficit disorder, and learning disabilities
- Speech, language, and behavioral problems

Among adults, pregnant women are especially at risk from exposure to lead.
Lead is passed from the mother to the fetus and can cause:

- Miscarriage
- Premature birth
- Brain damage
- Low birth weight

Health Risks of Lead – (cont.)

- In workers:
  - Elevated blood pressure
  - Loss of sex drive and/or capability
  - Physical fatigue

Lead Dust Sampling Technician
October 2011

Health effects of lead in adults include:

- Elevated blood pressure
- Reproductive problems in men and women
- Digestive problems
- Nerve disorders
- Memory and concentration problems
- Sexual disorders
- Muscle or joint pain

1-7

Why Are Dust and Debris a Problem?

- Renovations that disturb lead-based paint create dust and debris.
- Very small amounts of lead dust can poison children.
- Adults can swallow or breathe lead dust during work activities.
- Workers can bring lead dust home and poison their families.

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October 2011

Dust and debris from renovation, repair, and painting jobs in pre-1978 housing and child-occupied facilities may contain lead.

Pre-1978 paint may contain lead.

Common renovation activities like sanding, scraping, cutting, and demolition can create hazardous lead dust and chips by disturbing lead-based paint.

Some tasks, such as power sanding, open flame burning, and the use of heat guns above 1100 degrees Fahrenheit, create large amounts of extremely fine lead dust that is very difficult to clean up.

Small amounts of lead dust can poison children and adults.

A tiny amount of lead can be extremely harmful.

Lead dust particles are often so small that you cannot see them, yet you can breathe or swallow them. These smaller, inhaled or swallowed lead dust particles are more easily absorbed by the body than larger particles, and can therefore more easily cause poisoning.

Lead dust may be breathed or swallowed by children, residents, and workers.

Through normal hand-to-mouth activities, children may swallow or inhale lead dust on their hands, toys, food, or other objects. Children may also ingest paint chips.

Adults can swallow or breathe lead dust during work activities.

- When workers perform activities such as scraping and sanding by hand, or use a power sander or grinding tool, dust is created. The dust goes into the air that they breathe.
- If workers eat, drink, smoke, or put anything into their mouths without washing up first, they may swallow the lead dust present.

1-8

Regulations Addressing Lead Hazards in Housing

- To address the issue of lead hazards in housing, EPA and HUD have issued several regulations.
- EPA currently oversees the training and certification of abatement contractors, inspectors, and risk assessors.
- HUD's Lead Safe Housing Rule (LSHR) addresses lead hazards in Federally owned and assisted housing.
- In April 2008, EPA issued the Renovation Repair and Painting (RRP) Rule to address lead hazards created during renovation.

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1-9

Overview of the Lead Hazard Evaluation Courses

- **Lead Dust Sampling Technician**
- Lead-Based Paint Inspector
- Risk Assessor
  - All three disciplines can conduct dust clearance testing after an RRP project

EPA

Lead Dust Sampling Technician
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There are three courses for professionals who wish to be certified to conduct evaluations for lead dust, lead hazards and/or lead-based paint:

- **Lead Dust Sampling Technician:** This 8-hour training course teaches you how to become a lead dust sampling technician. You will learn how to conduct a visual inspection, collect dust wipe samples, interpret results, and write a lead dust clearance test report.
- **Lead-Based Paint Inspector:** To become a certified lead-based paint inspector, you must take a 24-hour training course. In the lead-based paint inspector course, you will learn the skills and protocols for conducting a paint inspection. A lead-based paint inspection is a surface-by-surface investigation to locate all lead-based paint on a property. We will talk more about what a paint inspection is in the next chapter.
- **Risk Assessor:** To become a certified risk assessor, you must successfully complete a lead-based paint inspector course plus an additional 16-hour risk assessor course. In the risk assessor course, you will learn the skills and protocols necessary for conducting risk assessments. A risk assessment is an on-site investigation to identify all lead-based paint hazards on a property.

Today you are taking the LDST Training Course.

Refer to **Attachment 1-A: Comparing Lead Evaluation Professionals** for additional information.

Lead Dust Sampling Technician

- EPA's RRP rule also established the lead dust sampling technician discipline.
- To work as a dust sampling technician, an individual must successfully complete this training course. The course completion certificate will serve as your certification.
- Dust sampling technicians are used in both EPA's and HUD's regulations.

1-11

A Lead Dust Sampling Technician *Can*...

- Perform post-renovation lead dust clearance testing under EPA's RRP Rule
  - Determines whether the work area has been sufficiently cleaned of lead dust after renovation, repair, or painting
- Perform a clearance examination after hazard reduction or maintenance activities in most properties covered by HUD's LSHR

Lead Dust Sampling Technician
October 2011

A lead dust sampling technician can perform lead dust clearance testing, but not if associated with an abatement.

The purpose of lead dust clearance testing after renovation, repair, or painting activities that disturb lead-based paint is to determine if a work area is safe for re-occupancy. These activities can create lead dust, so proper cleanup is critical.

1-12

A Lead Dust Sampling Technician Is *Not Allowed To*...

- Perform clearance after an abatement
  - Lead abatement jobs are designed to permanently eliminate lead-based paint hazards.
  - Clearance after an abatement must be done by a certified risk assessor or lead-based paint inspector and may not be done by a lead dust sampling technician.
- Sample paint for lead content
- Sample soil for lead

EPA Lead Dust Sampling Technician October 2011

While lead dust sampling technicians can conduct post-renovation lead dust clearance testing, they are not allowed to conduct post-abatement clearance. Clearance after abatement must be done by a certified risk assessor or a lead-based paint inspector.

Abatements are projects designed to permanently remove or eliminate lead-based paint and lead-based paint hazards.
Abatement does not include renovation, remodeling, landscaping, or other activities, when such activities are not designed to permanently eliminate lead-based paint hazards, but, instead, are designed to repair, restore, or remodel a given structure or dwelling, even though these activities may incidentally result in a reduction or elimination of lead-based paint hazards.
So, if a renovation job involves abatement, the lead dust sampling technician cannot perform lead dust clearance testing on the abatement part of the job. Make sure you understand what type of work was done before conducting lead dust clearance testing.
In addition, a lead dust sampling technician is not trained to test paint for lead content. Paint sampling must be done by a lead-based paint inspector, risk assessor or certified renovator.
Finally, a lead dust sampling technician is not trained to sample soil. Soil sampling must be done by a certified lead-based paint inspector or risk assessor.

HUD NOTE: HUD does not allow sampling technicians to work on abatement projects. HUD also requires that a certified risk assessor or a certified lead-based paint inspector approve the work of the clearance sampling technician and sign the clearance report. Sampling technicians may work on single-family properties or individually-specified dwelling units and associated common areas in a multi-unit property as directed by a certified risk assessor or a certified lead-based paint inspector, but may not themselves select dwelling units or common areas for testing.

EPA's RRP Rule

- Common renovation activities like sanding, cutting, and demolition can create hazardous lead dust and chips by disturbing lead-based paint.
- On April 22, EPA issued a rule requiring the use of lead-safe practices and other actions aimed at preventing lead poisoning.
- Beginning on April 22, 2010, all contractors performing renovation and all dust sampling technicians must be trained and certified.

EPA

Lead Dust Sampling Technician
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Beginning April 22, 2010, contractors performing RRP projects that disturb lead-based paint in homes, child care facilities, and schools built before 1978 must be certified and must follow specific work practices to prevent lead contamination.

EPA's RRP Rule – (cont.)

- Upon completion of renovation activity, the RRP Rule requires either:
  - cleaning verification by a certified renovator, or
  - lead dust clearance testing by a certified LDST, lead-based paint inspector, or risk assessor

- "Cleaning verification" need not be done if both lead dust clearance testing and achieving clearance is required by:
  - the contract between the renovator and the property owner, or
  - another Federal, State, or local law

EPA Lead Dust Sampling Technician October 2011

The cleaning verification process involves a visual inspection of the work area, followed by wiping of the windowsills, floors, and countertops with wet disposable cleaning cloths and comparing the wipes to a cleaning verification card.

Cleaning verification must be performed by a certified renovator; it cannot be done by the lead dust sampling technician and sampling technicians are not allowed to perform clearance on abatement projects or on abatement parts of renovation projects.

See **Appendix A** for a portion of the EPA RRP final rule.

HUD Note: A certified sampling technician may work on HUD-assisted single-family properties or individually-specified dwelling units and associated common areas in a multi-unit property. The sampling technician may work on a random sampling of dwelling units or common areas in multifamily properties only as directed by a certified risk assessor or a certified lead-based paint inspector, but the sampling technician may not select dwelling units or common areas for testing, and the risk assessor or inspector must approve the sampling technician's work and sign the clearance report for the report to be acceptable.

EPA's RRP Rule – (cont.)

- You must be a certified LDST to perform post-renovation clearance testing under EPA's RRP Rule.
- Successful completion of this course completes the certification process.
- You will be certified by either EPA, or if they are an authorized program, the State, Tribe, or Territory in which you work.

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To conduct a post-renovation clearance examination, the individual must be a certified lead dust sampling technician, lead-based paint inspector, or risk assessor.

EPA LDST certification allows the certified individual to perform post-renovation lead dust clearance testing in residential housing and child-occupied facilities. Certified lead dust sampling technicians cannot conduct post-abatement clearance testing.

When going to a worksite, lead dust sampling technicians must have a copy of their initial course completion certificate and most recent refresher training course completion certificate.

EPA's RRP Rule – (cont.)

- Before conducting dust clearance sampling after a renovation, a visual inspection of the work area for dust and debris is required.
- Results of dust clearance testing must be interpreted according to the EPA/HUD clearance standards and provided to the client.
- All surfaces represented by a failed clearance test must be re-cleaned and re-tested until the clearance level is met.

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More details on all these topics are discussed later in the course.

HUD's Lead Safe Housing Rule – (LSHR)

1-17

- HUD requires clearance testing on all but very small renovation or maintenance jobs.
- Clearance must be performed by a clearance examiner who is independent of those performing work (third party).
- This clearance must be performed by either a certified lead-based paint inspector, risk assessor, or sampling technician.
- HUD requires a visual inspection (assessment), dust sampling, laboratory analysis, and submission of a clearance report.

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HUD's LSHR requires that lead hazards be corrected in target housing receiving Federal housing assistance or being sold. It also requires clearance dust sampling as a routine part of every such activity, unless very small amounts of paint are disturbed.

1-18

HUD's LSHR – (cont.)

- HUD clearance generally covers an entire dwelling unit, common areas, and exteriors.
- Worksite-only clearance is permitted on certain renovation or maintenance jobs.
  - For ongoing lead-based paint maintenance
  - Rehabilitation assistance up to and including $5,000 per unit
- Clearance report must include specifics of property, results of visual inspection, laboratory information, dates, written description of work performed, and dust testing results.

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Clearance must be on the entire unit unless the worksite has been properly contained or the LSHR specifically permits worksite-only clearance. The LSHR permits worksite-only clearance for units receiving rehabilitation assistance up to and including $5,000 and for ongoing lead-based paint maintenance activities.

Sampling requirements will be discussed in later chapters.

1-19

HUD's LSHR – (cont.)

- Use EPA/HUD clearance standards to interpret dust sampling results.
- HUD requires that all surfaces represented by a failed clearance test be re-cleaned and re-tested until the clearance level is met.
- If the work area fails the visual inspection, the sampling technician must stop and require the renovator to re-clean.
- The sampling technician must then re-inspect before dust testing.

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Details on these topics are provided later in the course.

Attachment 1-A: Comparing Lead Evaluation Professionals

	LEAD DUST SAMPLING TECHNICIAN	LEAD-BASED PAINT INSPECTOR	LEAD-BASED PAINT RISK ASSESSOR
Is qualified to perform the following types of evaluations	▪ Post-renovation clearance testing ▪ Clearance after hazard reduction or maintenance activities in HUD-covered properties	▪ Paint inspections ▪ All clearance	▪ Risk assessments ▪ Paint inspections ▪ All clearance
Is <u>not</u> qualified to perform	▪ Post-abatement clearance ▪ Soil and paint testing	▪ Risk assessments	
Training/Certification required to perform evaluations	▪ Certification ▪ 8 training hours	▪ Certification ▪ 24 training hours	▪ Certification ▪ 40 training hours (24 inspector hours and 16 risk assessor hours)
Skills	Perform: ▪ Visual inspection ▪ Lead dust wipe sampling To identify dust lead hazards after renovation.	Perform: ▪ Visual inspection ▪ Paint chip sampling ▪ Paint testing by XRF ▪ Lead dust wipe sampling for clearance To identify the existence and location of lead-based paint.	Perform: ▪ Interview of residents ▪ Visual inspection ▪ Lead dust wipe sampling ▪ Soil sampling ▪ Paint chip sampling ▪ XRF testing To assess a unit, identify all lead hazards, and recommend methods for lead hazard reduction.

Chapter 2: Visual Inspection

INSTRUCTOR NOTES **CHAPTER 2: VISUAL INSPECTION**

Objectives:	The major objective of this chapter is to teach students to perform visual inspections. Specific objectives include the following: • List the items that should be identified in a visual inspection • Identify: – Visible dust or debris – Paint chips – Deteriorated paint • Record results on a visual inspection form
Introduction to this chapter:	This chapter is designed to give students the tools to perform visual inspections and report their findings on standard forms in a manner that is understandable to clients and future contractors. This chapter will demonstrate what students should look for as they perform visual inspections and where they should look for potentially problematic areas within housing units.
Activities:	**Photographs tell the story. Slides 2-8 through 2-16** have photographs of deteriorated paint caused by different conditions. The object here is to get students thinking about the many sources of deteriorated paint and how they might be creating dust or paint chips in the home. For each picture, discuss with the group the likely source of the problem and why this deteriorating paint could be a problem.
Review:	See **Slides 2-18** and **2-19** for this chapter's review topics. Ask students if they have any questions about the material before moving on to the next chapter.
Notes:	The pictures included in **Slides 2-8 through 2-16** should be "narrated" and explained to students so that they understand that these images demonstrate problematic conditions in the units they are assessing. Students should understand how to recognize each of these conditions by the end of the chapter. Be sure to point out **Attachments 2-A and 2-B**, a blank and completed sample visual inspection form, which students can use to model their notetaking as they perform visual inspections.

Chapter 2

Visual Inspection

Lead Dust Sampling Technician
October 2011

2-2

Objectives

- Learn what a visual inspection is
- Learn the steps for performing a visual inspection under both EPA's and HUD's regulations
- Learn when to look for deteriorated paint, visible dust or debris, and paint chips
- Record results on a visual inspection form

EPA Lead Dust Sampling Technician
October 2011

This chapter will outline the steps a lead dust sampling technician must take to perform a visual inspection. A visual inspection is the first activity to perform on site for any lead dust clearance testing. This chapter will also highlight the differences in visual inspection between EPA's RRP Rule and HUD's LSHR.

Visual Inspection

- Under both EPA's and HUD's rules, visual inspection is the first step in the clearance process.
- Under EPA's rule, the visual inspection is designed to determine if the area is free of visible dust and debris before lead dust clearance testing can begin.

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Visual Inspection – (cont.)

- The visual inspection determines whether the unit/work area (interior and exterior) is clear of visible conditions that can result in exposure to lead-based paint hazards:
  - Chips or debris
  - Visible dust
- In addition, HUD's rule requires identification of deteriorated paint.
  - Required before dust sampling can begin
  - Whole-unit clearance generally required

EPA Lead Dust Sampling Technician October 2011

The visual inspection determines whether the unit/work area is clear of conditions that can result in exposure to lead-based paint hazards, such as paint chips, debris, visible dust, and deteriorated paint. If these conditions are present, the unit does not meet EPA's and HUD's rules for lead dust clearance testing. HUD generally requires visual inspection and clearance of an entire unit, with worksite-only clearance allowable under certain conditions.

2-5

Visual Inspection – EPA RRP Lead Dust Clearance Testing

- At the conclusion of the renovation, the certified renovator may have conducted a visual inspection to look for paint chips, dust, and debris.
- The LDST must conduct a separate visual inspection of the work area to ensure that the area is ready for lead dust sampling.
- If any paint chips, dust, or debris are found, the renovation firm should re-clean these areas before the dust sampling technician begins to collect dust wipe samples.

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It is important for the lead dust sampling technician to understand that the renovation firm may perform his or her own preliminary visual inspection. The lead dust sampling technician should also perform a visual inspection of the work area. If the lead dust sampling technician observes paint chips, dust, or debris in the work area, these conditions must be brought to the attention of the certified renovator for re-cleaning.

Visual Inspection – HUD LSHR

- Addresses entire unit unless worksite-only clearance is allowed.
- Do not perform lead dust clearance testing if unit/work area does not pass visual inspection.
- If deteriorated paint, dust, or debris is found, it must be eliminated before dust testing may begin.
  - See **Attachment 2-A and 2-B**

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Why look for deteriorated paint?
In order to address lead dust in a housing unit, you need to address its sources, including deteriorated lead-based paint. If paint contains lead, deteriorated paint can create chips and dust, which can cause exposure to lead.

* NOTE: The LSHR refers to this process as a "visual assessment," but for purposes of this curriculum, the term "visual inspection" is used.

Visual Inspection – HUD LSHR

- Inspect exterior area if:
  - Exterior painted surfaces have been disturbed by renovation activity
  - Openings to exterior were not sealed during interior work
- Inspect ground and outdoor living areas close to affected surfaces
- Visible dust or debris must be removed
- Deteriorated paint must be eliminated
- Dust sampling is not performed for exterior work

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EXTERIOR VISUAL INSPECTION IS NOT REQUIRED IF ONLY INTERIOR WORK IS PERFORMED. An independent third party is needed to do an exterior visual inspection if the exterior work was done under HUD's LSHR. A certified dust sampling technician is qualified to perform this inspection.

For more information, see **Appendix B** or 24 CFR 35.1340.

HUD Note: HUD requires sampling technicians to verify with renovator that openings to the exterior are closed during interior work. If not closed, exterior visual inspection is required for interior work.
Dust sampling is not required for exterior work. There are no dust-lead clearance standards for porches, balconies, railings, or other horizontal exterior features.

Exterior Debris

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Visual Inspection – HUD LSHR

- Identify any paint that is not intact:
  - Chipping
  - Peeling
  - Chalking
  - Cracking
  - Holes, moisture, and friction damage
- Hairline cracks and nail holes are not considered deteriorated paint.

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Deteriorated paint is any paint that is not intact. It does not have to be peeling paint. As seen in the following photographs, deteriorated paint can include:
• Chipping paint on door and window trim
• Peeling paint and flaking paint on walls and window sashes
• Paint with small bubbles that look like blisters
• Paint with lines and cracks that make it easy to peel the paint away
• Paint that is “chalking” or creating chalk-like dust

Note: Hairline cracks and nail holes are not considered deteriorated paint.

2-10

Visual Inspection – HUD LSHR

- Dust
  - Dust you can see
- Debris
  - Pieces of wood, bits of plaster, and various other building pieces covered in paint
- Paint chips
  - Small pieces of paint

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What do visible dust, paint chips, and debris look like?
• Visible dust is dust you can see.
• Debris can be pieces of wood, bits of plaster, and various other building pieces covered with paint that are left in the room or near where the work was done.
• Paint chips are little pieces of paint. Chips can be even smaller than your fingernail or larger than your hand. Look for paint chips on floors and windows.

Visual Inspection – HUD LSHR

Chipping Paint

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Visual Inspection – HUD LSHR

Holes in wall

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Visual Inspection – HUD LSHR

Deteriorated Paint

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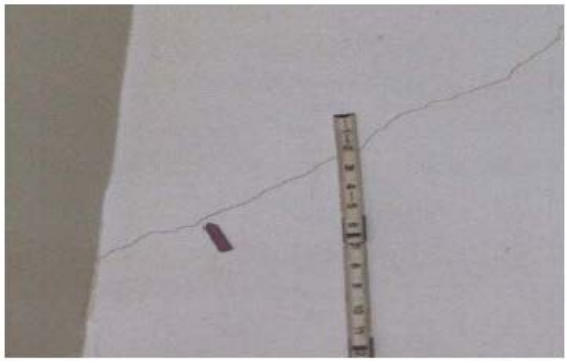
Visual Inspection – HUD LSHR

Cracking Paint



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The arrow here points to a crack in the paint.

Visual Inspection – HUD LSHR

Moisture Damage

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Moisture can be the cause of many paint problems. In this case, it is causing the paint to bubble.

Visual Inspection – HUD LSHR

Friction Damage

Visual Inspection – HUD LSHR

- Be precise about locations.
- Write down results as you go.
- Write down other information, indicating source.
- See sample visual inspection form. (**Attachment 2-B**)

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When recording the results of a visual inspection, take the following steps:

- Be precise about locations (e.g., room descriptions and/or specific areas in room) where visible dust, debris, paint chips, and deteriorated paint were found.
- Write down results as you go along.
- Write down other information the client provides about the surface in question.

See Completed Sample Visual Inspection Form in **Attachment 2-B.**

Review

- Visual inspection is the first step to clearance.
- EPA's visual inspection determines that the area is free of dust and debris before dust clearance testing can begin.
- HUD's visual inspection also checks for deteriorated paint and generally covers the entire unit unless worksite-only clearance is allowed.

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- See **Slides 2-3 through 2-16** for information and answers.
- See **Slide 2-3** for information and answers.
- See **Slides 2-3 through 2-9** for information and answers.

Review – (cont.)

- Visual inspection as part of clearance is the responsibility of the dust sampling technician.
- Be methodical in your visual inspection, and record results.

Attachment 2-A: Sample Visual Inspection Form

SAMPLE VISUAL INSPECTION FORM

Date and Time of Clearance	
Lead Dust Sampling Technician	
Client	
Property Address	

Location	Identify visible areas of dust, paint chips, painted debris, and deteriorated paint. *(Note location: walls, ceiling, floors, doors, windows, trim, cabinets, approximate square footage, etc.)*

Attachment 2-B: Completed Sample Visual Inspection Form

SAMPLE VISUAL INSPECTION FORM

Date and Time of Clearance	*8/5/09 11:00AM*
Lead Dust Sampling Technician	*Jane White*
Client	*The Smith Family*
Property Address	*78 East Main Street* *Hammond, IN 89898*

Location	Identify visible areas of dust, paint chips, painted debris, and deteriorated paint. *(Note location: walls, ceiling, floors, doors, windows, trim, cabinets, approximate square footage, etc.)*
Entry Area	
Living Room	
Dining Room	
Kitchen	*Window above sink; deteriorated paint on window sash. Client said deteriorated paint was tested and is not lead-based paint.*
Common Area	
Bedroom #1 *Small bedroom (Street Side)*	*East window; deteriorated paint on lower sash and dust and paint chips in trough. Client said deteriorated paint was tested and is not lead-based paint.*
Bedroom #2 *Small bedroom (Back of the house)*	*Dust and paint chips on floor.*
Bath #1	
Exterior	

Chapter 3: Lead Dust Wipe Sampling

Objectives:	The major objective of this chapter is to teach students where and how to take a lead dust wipe sample. Specific objectives are the following: • Learn when and where to take a dust wipe sample • Learn how to take a dust wipe sample • Sample 3 surfaces where dust is collected • Learn the difference between single-surface and composite sampling
Introduction to this chapter:	This chapter is designed to teach students to collect single-surface lead dust wipe samples and to understand the role of composite samples. The chapter will cover this material in three ways: • Images of lead dust wipe sampling techniques • Description and demonstration of lead dust wipe sampling process • Hands-on practice of lead dust wipe sampling As you cover the material in this chapter, be careful to connect these three pieces for students to understand how each of the components fit together into a single skill set.
Activities:	There are three activities in this chapter: two demonstrations and one hands-on exercise. **Demonstration: Lead Dust Contamination Demonstration** The first demonstration takes place on **Slide 3-3** and requires a packet of artificial sweetener. Show the packet and explain that an amount of lead dust equal to the amount of sweetener in this one packet is enough to contaminate a large area. (**Note:** Use artificial sweetener rather than sugar because it is finer. Only do this demonstration if you have a **non-carpeted floor** to work on. If you only have carpeted surfaces, simply empty the packet of sweetener into your hand, show it to the class and explain that this is enough to contaminate 500 ft^2 (about four 10' by 12' rooms) to a level of 10 micrograms/ft^2) Do the following demonstration to emphasize the point: 1. Tear open a packet of artificial sweetener and sprinkle it on the floor. 2. Ask a few participants to walk through it. 3. Now give a participant a broom and tell him or her to sweep up the sweetener. 4. Question to the class: Do you think all the sweetener has been cleaned up or removed? Ask them if there is any on the soles of the shoes that walked through it. Where is that sweetener

	now? 5. Explain that one way to test the amount of sweetener on the floor is to do a dust wipe. 6. Demonstrate the dust wipe sampling process. 7. Question for the class: Do you think a lab analysis would show sweetener on the wipe? 8. Now tell the class to imagine that the packet was actually full of lead dust. It is possible that this small amount of lead dust (1 gram) could contaminate several rooms. If the packet contained a gram of crushed paint that contained just enough lead to be defined as lead-based paint (0.5% lead by dry weight), it would hold 5,000 micrograms of lead. Once crushed into dust, this is enough to contaminate 500 ft^2 (about four 10' by 12' rooms) to a level of 10 micrograms/ft^2. If the dust had a higher lead content, it could contaminate an even larger area. At 1% lead, one gram could contaminate 1,000 ft^2 (about four 16' by 16' rooms); at 5% lead, it could contaminate 5,000 ft^2 (about the size of a large family home).
	Hands-On Exercise: Lead Dust Wipe Sampling Description: In this exercise, starting on **Slide 3-35,** each student will take a lead dust wipe sample following the protocol discussed in the chapter. Materials: • Disposable lead dust wipes (individually wrapped) • Disposable gloves • Disposable shoe covers • Sample tubes with caps • Reusable templates (can be made or purchased) • Masking or painter's tape • Ruler • Sample collection forms • Chain-of-custody forms • Markers, trash bags, labels, pens, re-sealable storage bags • Calculator • Sanitary wipes **Note:** To be effective, at most, a 6:1 student-to-teacher ratio is recommended. The instructor may want to bring in additional qualified instructors to oversee this activity. Steps: 1. Distribute sampling materials and a blank sample collection form to the students.

	2. Divide students into groups of three or four individuals, depending on class size. 3. Using the templates and dust sampling materials, have each student practice lead dust wipe sampling techniques and complete the blank sample collection form. Have students refer to **Attachment 3-F: Lead Dust Wipe Checklist** for assistance. 4. Encourage students to take samples on a variety of surfaces – windowsills, troughs, and uncarpeted floors. 5. Go to each of the groups and review the students' sampling, measuring, and recording techniques. Correct any errors and answer any questions students may have. 6. Have students briefly discuss any problems they encountered and ask any relevant questions. Use **Slide 3-37** to guide the discussion. Use **Slides 3-36 and 3-37** to kick off and debrief the exercise.
	Demonstration of Inaccurate Measurement In discussing common mistakes on **Slide 3-36,** consider this scenario. Write it on a white board or flipchart to illustrate: • Suppose you record the interior sill sample area as 3 inches by 24 inches. That's 72 in². • But suppose the sample area was really 3 1/8 inches by 24 inches. That gives you 75 in². This is significantly more than 72 in^2 and will affect the results. • Now suppose the results come back from the lab that there was 51 μg in the sample. 51 μg over 72 in² translates to 102 $\mu g/ft^2$. • But 51 μg over 75 in² translates to 98 $\mu g/ft^2$. • In the first case, the sample exceeds the standard clearance of 100 $\mu g/ft^2$. In the second case, the sample does not exceed the standard. • We'll discuss the standards later in this course. For now, your take-away message should be that a small measurement mistake can mean the difference between passing and failing clearance.
Review:	See **Slide 3-42** for this chapter's review topics. Ask students if they have any questions about the material before moving on to the next chapter.
Notes:	Be sure to point out **Attachments 3-A and 3-B**, blank and completed sample collection forms, which students should use to model their notetaking as they take lead dust wipe samples. Refer students to **Attachment 3-E: Worksheet for Performing Mathematical Calculations from Fractions to Decimals** for

	assistance in performing mathematical calculations and conversions as they complete their sampling forms.

Chapter 3

Lead Dust Wipe Sampling

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Objectives

- Learn when and where to take a dust wipe sample
- Learn how to take a dust wipe sample
- Sample 3 surfaces where dust is collected
- Learn the difference between single-surface and composite sampling

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Why Collect Samples

- You cannot tell by looking at dust whether it contains lead.
- A small amount of lead dust can contaminate a room.

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Why collect samples?

- Not all dust contains lead.
- You cannot tell by looking whether dust is contaminated with lead. A laboratory test is needed.

Activity: Lead Dust Contamination Demonstration

It only takes a little lead to contaminate a room. For example, imagine that each granule of artificial sweetener in a sweetener packet represents a tiny piece of lead. If only two or three of these “lead” granules were placed in a 1 square-foot area of floor, enough lead would be present to exceed the EPA clearance standard for lead dust. An individual granule is very small and would be nearly impossible to find by simply looking at an area, especially if the granule was ground up into smaller particles and spread throughout the area.

A Lead Dust Wipe Measures:

- Total amount of lead dust on a specific surface area (lead loading)
  - The EPA lead dust clearance standards use this type of measurement.
- Lead present at the time and location of sample collection
  - Does not tell you about past or future levels
  - Lead levels can change depending on the activity in the house or in different locations

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A dust wipe measures the total amount of lead dust on a specific surface area. This measurement is called lead “loading.” Lead loading is a good indicator of the amount of lead to which a child is exposed.

- Dust wipes measure lead dust at a particular point in time.
- Lead levels can change as the amount of lead dust on the surface changes.
- Lead levels also can change depending on the activity in the house, including activities that disturb lead-based paint and the frequency of cleaning.
- The measurement tells you how much lead existed when the sample was collected; it does not tell you about past or likely future lead levels.

3-5

Timing of Dust Sampling

- You must wait at least 1 hour after final cleanup is completed and visual inspection is passed before collecting samples.
- This allows time for dust to settle out of the air and onto surfaces.
- Be strategic about laying out sampling area to capture areas were the highest dust generating tasks occurred during the job.

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You must wait a minimum of 1 hour after the final cleanup is completed before collecting dust wipe samples. This allows time for the dust to settle out of the air and onto surfaces.

Sampling Strategy

- A single surface dust wipe measures total lead dust from a specific surface on component or area.
- When choosing sampling locations, identify areas where the most dust was generated during the job.
- Whenever possible sample hard floors, not carpets.
- Make sure to follow the sampling requirements in the next slides or the *Field Guide* to select your final sample locations.

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• Single-surface dust wipe samples contain one wipe from one surface.
– They measure lead dust from a specific surface, such as a floor or an interior windowsill.
– They measure the total lead in the surface area.
– They do not tell you about dust lead levels in other places on the same surface. Dust lead levels can vary substantially.

When planning a sampling strategy, consider your sample numbering scheme and prepare for the number of samples you expect to take. Try to capture the sampling locations near dust-generating tasks that occurred during the job.

3-7

Lead Dust Wipe Sampling Locations: EPA RRP Rule

- If there is more than 1 room, hallway, or stairwell within the work area, take:
  - 1 windowsill sample and 1 floor sample within each room, hallway, or stairwell (no more than 4 rooms, hallways, or stairwells need be sampled)
  - If the windows were not closed and covered with plastic during the renovation, also take 1 window trough sample in each room, hallway, or stairwell (no more than 4 need be sampled).
  - 1 floor sample adjacent to the work area, but not in an area that has been cleaned
- For Federally-assisted housing, take these samples if the work area is contained, otherwise, clear the whole unit, as discussed in the previous slide.

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Although cleaning verification is not performed on carpeted floors, dust clearance sampling is. LDSTs should not avoid sampling carpeted floors.

If the work area includes more than 4 rooms, hallways, or stairwells, only 4 must be sampled. A windowsill sample and a floor sample must be collected from each of 4 rooms, hallways, or stairways within the work area.

The RRP Rule requires all objects and surfaces, including floors, within 2 feet of the work area to be cleaned after the work has been completed. Floor samples required to be collected outside of the work area must be collected outside of the cleaned area surrounding the work area.

Window troughs may contain pre-existing dust lead hazards. If possible, LDSTs should discuss the window trough sampling requirements with the certified renovator before the renovation begins. If the windows in the work area remain closed and covered with plastic during the renovation, window trough sampling will not be necessary.

The next few slides on sampling apply to HUD as well.

Lead Dust Wipe Sampling Locations: EPA RRP Rule – (cont.)

- If the work area is a single room, hallway, or stairwell, or a smaller area, take:
  - 1 windowsill sample and 1 floor sample
  - If the windows were not closed and covered with plastic during the renovation, also take 1 window trough sample.
  - 1 floor sample adjacent to the work area, but not in an area that has been cleaned.

3-9

HUD Clearance

- HUD does not allow clearance to be performed on a work area alone that has not been adequately contained
- HUD clearance can be done in several ways
  - Whole unit clearance in most cases
  - Worksite-only clearance in some cases
  - Clearance for interior work when containment is used
- LDST should discuss sampling strategy with renovator prior to start of work
- See HUD Sampling Appendix and optional HUD Sampling Exercise for detailed descriptions of HUD sampling strategies.

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HUD has different requirements than EPA for clearance. Although EPA's post-renovation clearance protocol is similar to HUD's allowed protocol for worksite-only clearance, HUD has additional requirements to use this sampling strategy. Although the sampling requirements are very important for Federally-funded renovation activity, these units will represent a relatively small percentage of all renovation projects performed nationwide. Because most of the renovation jobs that are expected to occur in U.S. housing will not be funded with Federal housing assistance, details on HUD sampling are provided attached to the curriculum in the optional sampling exercise for HUD-assisted work and in the HUD sampling appendix. All LDSTs should discuss sampling plans with the renovator before work begins; with particular attention to whether the project is receiving Federal housing assistance, so the proper sampling strategy can be used to comply with the Lead Safe Housing Rule.

3-10

How To Take Dust Wipe Samples

- Now that you know where and when to sample, the next section will cover the most important part of the course: How to take dust wipe samples.
- Regardless of the rule you are working under, the methods for taking and later analyzing dust wipe samples are identical.

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3-11

Dust Wipe Sampling Materials

- **Wipes** - Disposable individually packaged wipes. Check with you laboratory, they often provide these
- Disposable **gloves** - Should be non-sterilized and non-powdered
- Disposable **shoe covers** - Use of disposable shoe covers helps to minimize the transfer of settled dust from one location to another.
- **Containers** - Centrifuge tubes or other hard plastic, non-glass containers. They should be non-sterilized, plastic tubes equipped with a sealable lid.
- Reusable **template -** A 12” x 12” reusable template for floors**.**

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Key supplies are listed above. Check with your analytical lab, because they will often provide some of these materials.

- **Disposable lead dust wipes.** Use individually packaged wipes (laboratories often provide these). The wipes should meet ASTM Standard E1792-03. Do not use any wipes that contain aloe or lanolin.
- **Disposable gloves.** Gloves should be disposable. Non-sterilized and non-powdered gloves are recommended because powder on gloves may contaminate the sample (laboratories often provide them).
- **Disposable shoe covers.** Use of disposable shoe covers between buildings and the removal of shoe covers before entering your vehicle can be helpful in minimizing the inadvertent transfer of settled dust from one location to another.
- **Centrifuge tubes or other hard plastic, non-glass container.** They should be non-sterilized, plastic tubes equipped with a sealable lid.
- **Reusable templates.** A 12”x12” reusable plastic or disposable cardboard template is best.

3-12

Dust Wipe Sampling Materials – (cont.)

- **Tape** - Painter's or masking tape works well
- **Ruler** -To measure sampling areas if templates are not available
- Sample collection forms and **chain-of-custody forms**
- Labeling and cleanup **supplies**. Permanent markers, trash bags, labels, re-sealable storage bags, and sanitary wipes
- **Pen** -To complete the sample collection form, label tubes, and write down notes
- **Calculator** - To assist in the calculation of sampling area dimensions

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Key supplies are listed above. Check with your analytical lab, because they will often provide some of these materials.

Tape. Painter's or masking tape works well. Tape is used to secure templates while taking dust samples and to outline sample areas when templates are not available.
Ruler. To measure sampling areas if templates are not available.
Sample collection forms and chain-of-custody forms. Laboratories will generally provide their own forms.
Labeling and cleanup supplies. Permanent markers, trash bags, labels, re-sealable storage bags, and sanitary wipes for face and hands if no access to warm and soapy water.
Pen. A pen should be used to complete the sample collection form, label tubes, and write down notes.
Calculator. A calculator should be used to assist in the calculation of sampling area dimensions.
Sanitary Wipes. To be used for cleanup if no access to warm, soapy water.

3-13

Blank Samples

- A new, unused wipe that is tested at the laboratory to determine whether the sampling medium is contaminated.
- Laboratory should not know they are blanks
  - Blanks should be assigned sample numbers and locations.
  - Only your copy of the sample collection form should identify which samples are blanks.
- One blank sample should be submitted
  - For each job tested
  - From each wipe lot

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Blank samples are new, unused wipes that are sent to the laboratory to determine whether the sampling media are contaminated by providing a "clean" (assumed lead-free) wipe for comparison. Because you should prepare blank samples on every job, you should factor the costs associated with these samples into your fee. Submitting blank samples is important to test the accuracy of your sampling techniques, the sampling media, and the laboratory's analysis.

Preparing blank samples. You should prepare blank samples in the same manner as other dust wipes.

- Prepare blank samples at the end of a job – after collecting all of your dust wipe samples.
- Remove a new wipe from the container with a new glove, shake the wipe open, and refold it as you would if you were taking a dust sample.
- Insert the unused wipe into a sampling container without touching any surfaces.

Labeling and submitting blank samples. Blank samples should be labeled so you can identify them, but the lab cannot. Do not label blank samples as "blank."

- Give the sample a fictitious number that looks like your other sample numbers and provide a fictitious sample location and measurements to the lab.
- Keep notes in your records identifying the blank sample number.
- Submit one blank sample for each unit sampled. Additionally, one blank should be included from each wipe lot used to ensure that the lots are not contaminated. The wipe lot number is usually found on the bottom of the wipe container.
- It is improper to label blanks as such because of the unavoidable potential for biasing the laboratory analysts; it is poor practice to have all blanks at the same portion of each unit's (and each wipe lot's) samples.

Interpreting blank samples. If the laboratory detects more than 10 µg/wipe, one of three errors may have occurred:

- The dust wipes were contaminated before you began using them;
- You contaminated the wipes during your sampling; or
- The laboratory contaminated them during the analysis.

If the blank sample is contaminated, then the data should not be used and the unit in question should be re-sampled.

How To Collect Samples

Step 1: Put on disposable shoe covers and lay out the sample area.

Step 2: Prepare the tubes.

Step 3: Put on clean gloves.

Step 4: Sample the selected area and place wipe in tube.

Step 5: Measure the sample area.

Step 6: Record sample area (dimensions) on forms.

Step 7: Clean up.

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This slide presents an overview of the dust sample collection process, which has seven key steps. Each of these steps is presented here and in more detail later in this training.
Step 1: Put on disposable shoe covers and lay out the sample area. Carefully outline the area you will sample using a template or tape.
Step 2: Prepare the tubes. Label the tubes and place partially opened tubes near the spot you will sample.
Step 3: Put on clean gloves. Put on clean gloves before collecting each sample. This helps minimize contamination.
Step 4: Wipe sample area. Wipe the entire area you laid out with disposable wipe for the sample. Fold the wipe and place it in the appropriate tube.
Step 5: Measure the sample area. Measure the area sampled.
Step 6: Record sample area on forms. Record measurement on sample collection form and chain-of-custody form.
Step 7: Clean up. Sampling materials must be cleaned or removed from the site because they may be contaminated.

Step 1: Put on Disposable Shoe Covers and Lay Out the Sample Area

3-15

- Put on shoe covers.
- Outline sample area with tape or a template.
- Templates should be durable material.
  - Floor sample is generally 12” x 12”
  - Make sure you clean the template with a new wipe.
- Tape can also be used to outline the sample area.
- Lay out tape squarely so you can accurately measure the sample area later.
- Do NOT touch area inside the sample area.

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Step 1: Put on Disposable Shoe Covers and Lay Out the Sample Area

The following describes how to lay out the sample area using a template. Whenever possible, use a template to avoid measurement errors. **(*Make sure you clean the template before following sampling protocol.)**

The templates will vary in their dimensions:

- The floor template should have a 144-square inch or 1-square foot opening (12 inches = 1 foot) or an alternative area that has accurately known dimensions. A square foot is the basic measurement used by EPA-recommended guidance for lead dust clearance testing.
- The interior windowsill or window trough template should have an opening of at least 16 square inches (approximately 2” x 8”). Interior sills can vary in width.
- Tape the template to the appropriate surface (floor, interior sill, or interior trough) using masking or painter’s tape. Be careful to avoid placing your hands in the sample area, as this might remove or add lead dust and give you a misleading result.
- If using tape, ensure that the tape is laid out squarely so that an accurate area can be determined for the sample size. It is very difficult to measure the area if the tape is not laid out in a square or rectangle.

Do not touch or otherwise disturb the area inside the measured sample area. This could remove or add lead dust and give you a misleading result. (You will measure the exact area of the sample area after collecting the dust sample.)

Here is an example of how the sampling area is laid out when you have a template. Note how it is taped to the floor.
***Be sure to clean reusable templates.** Tape corners at 45 degree angle away from the corner.
***Be sure not to touch the inside of the sample area.**

Outlining Sample Area with Tape

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Here is an example of using tape to outline the sample area on a floor when a template is not available. Make sure that the tape is laid at right angle to ensure a that the area outlined as close to a perfect square as possible. Doing so will make measure the area of the sample much easier and more accurate.

If a template for a sill or trough is not available, lay out the sampling area with painter's tape. Place tape perpendicular to the edge of the sill or trough. The sample area will be calculated after taking the sample to avoid contaminating the area.

If the sill or trough is not taped, the width of the sample area varies from front-to-back when the ends of the sill or trough are not parallel straight lines, so the area of the sample will be difficult to determine.

Make sure the area you are sampling is at least 16 square inches. Try to sample at least 8" of sill width.

Step 2: Prepare the Tubes

- Use clean, hard-sided tubes.
- Make sure tube is labeled with an ID number.
- Record ID number on sample collection form and chain-of-custody form.
- Partially unscrew tube cap.
- Place tube near sample area.

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Step 2: Prepare the Tubes

Tubes must be prepared so that they are properly labeled and are accessible to you when you are ready to put your samples in them.

- Label each tube with an identification number.
- Record the identification number on the sample collection form and chain-of-custody form.
- Partially unscrew the cap on the tube to be sure you can open it easily.
- Place the tube near the area you plan to sample. This avoids possible contamination of the wipe and loss of sampled dust between the time you collect the sample and place it in the tube.
- Organizing tubes in a portable test tube rack may be helpful.

Step 3: Put on Clean Gloves

- Use disposable gloves.
- Use new gloves for each sample.
- After putting on the gloves, do NOT touch anything else before you pick up the wipe.

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Step 3: Put on Clean Gloves

Wearing clean gloves avoids transferring lead dust from your hands to the wipe.

- Use disposable gloves.
- Use new gloves for each sample collected.
- Do not put on the gloves until you are ready to take the sample. You can contaminate the gloves if you touch other surfaces, such as when measuring the sample area.
- After putting on the gloves, do NOT touch anything else before you pick up the wipe.

Step 4: Wipe Sample Areas

- The procedures for taking dust wipe samples from floors, windowsills, and troughs are listed on the following slides.
- The procedure for sampling floors is different than the procedure for sampling windowsills and troughs.
- Step 4 of lead dust wipe sampling is also described in the *Lead Dust Sampling Technician Field Guide.*

3-22

Step 4: Wipe Sample Area – Floors

- Do not touch other objects. They can contaminate the wipe.
- Press the wipe down firmly (with fingers, not the palm of the hand) at an upper corner of the sample area.
- Make as many “S” like motions as needed to wipe the entire sample area, moving from side to side. Do not cross the outer border of the tape or template.
- Fold the wipe in half, keeping the dirty side in, and repeat the wiping procedure (“S” like motion). Folding wipe carefully helps to prevent the loss of any collected dust.

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Step 4: Sampling Procedure for Floors

- Do not touch other objects. They can contaminate the wipe.
- Press the wipe down firmly (with fingers, not the palm of the hand) at an upper corner of the sample area.
- Make as many “S”-like motions as needed to wipe the entire sample area, moving from side to side. Do not cross the outer border of the tape or template.
- Fold the wipe in half, keeping the dirty side in, and repeat the wiping procedure (“S” motion). This helps to prevent the loss of any collected dust.

3-23

Step 4: Wipe Sample Area – Floors (cont.)

- Fold the wipe in half again, keeping all the dust in the wipe, and repeat the wiping procedure one more time, concentrating on collecting dust from the corners within the selected surface area.
- Wipes are folded to keep the collected dust within the wipe, avoid dust losses, and to expose a clean wipe surface for further collection.

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Step 4: Sampling Procedure for Floors

- Fold the wipe in half again, keeping all the dust in the wipe, and repeat the wiping procedure one more time, concentrating on collecting dust from the corners within the selected surface area.
- Wipes are folded to keep the collected dust within the wipe, avoid dust losses, and to expose a clean wipe surface for further collection.

Students should refer to **Attachment 3-A: Sample Collection Form** and **Attachment 3-B: Completed Sample Collection Form.** A checklist of the key steps involved in taking a dust sample can be found in **Attachment 3-D: Lead Dust Wipe Checklist** and the ***Lead Dust Sampling Technician Field Guide.***

3-24

Step 4: Wipe Sample Area – Floors (cont.)

- Fold the wipe again with the sample side folded in, and place the folded wipe into the sample tube. Avoid contact with other surfaces.

- Cap the container. Discard the gloves into a trash bag.

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Step 4: Sampling Procedure for Floors

- Fold the wipe again with the sample side folded in, and place the folded wipe into the sample tube. Avoid contact with other surfaces. Wipes should be stored only in their original container or in the tube. Do not use plastic bags or other items to hold wipes. Blank wipes should also be used. Blanks should be assigned sample numbers and locations so that the laboratory does not know they are blanks. Only your copy of the sample collection form should identify which samples are blanks
- Cap the container. Discard the gloves into a trash bag.

Students should refer to **Attachment 3-A: Sample Collection Form** and **Attachment 3-B: Completed Sample Collection Form.** A checklist of the key steps involved in taking a dust sample can be found in **Attachment 3-D: Lead Dust Wipe Checklist** and the ***Lead Dust Sampling Technician Field Guide.***

Floor Sampling

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Floor Sampling

Floor Sampling

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Step 4: Wipe Sample Area – Windowsills and Troughs

- Sampling interior windowsills and troughs
  - Hold fingers together and flat against surface.
  - Wipe surface in a single pass while applying constant pressure.
  - Fold wipe in half with wiped side in and wipe in both directions.
  - Fold wipe in half again with wiped side in and concentrate on corners and edges.
  - Place the folded wipe in the tube.

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Special Considerations for Interior Windowsills and Troughs
Window troughs may contain pre-existing dust lead hazards. If possible, LDSTs should discuss the window trough sampling requirements with the certified renovator before the renovation begins. If the windows in the work area remain closed and covered with plastic during the renovation, window trough sampling will not be necessary.

Sampling Procedure for Windowsills and Troughs:
- Holding the fingers together and flat against the selected surface area, wipe the measured surface in one direction in a single pass. Apply pressure to the fingers while wiping the surface. This will avoid overloading the wipe on the first pass.
- Fold the wipe in half with the sample side folded in, and repeat the preceding wiping procedure in both directions within the selected surface area on one side of the folded wipe.
- Fold the wipe in half with the sample side folded in, and repeat the preceding wiping procedure one more time, concentrating on collecting settled dust from the corners within the selected surface area.

3-29

Step 4: Wipe Sample Area – Windowsills and Troughs – (cont.)

- Sampling interior windowsills and troughs
  - Cap the tube
  - Label the tube properly.
  - Measure and record the dimensions of the selected sampling area. Discard the gloves into a trash bag then close the bag.

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Special Considerations for Interior Windowsills and Troughs

Sampling Procedure for Windowsills and Troughs:

- Fold the wipe again with the sample side folded in, and insert the folded wipe into the tube and cap it.
- Label the tube with sufficient information to uniquely identify the sample.
- Measure and record the dimensions of the selected sampling area (the area actually wiped during sample collection). Discard the gloves into a trash bag.

Sampling a Windowsill

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Note how the lead dust sampling technician is holding the wipe and moving across the windowsill.

Sampling a Window Trough

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Here is an example of how to sample a window trough. The trough is not taped because its area is less than 16 inches, so sample the entire trough and determine its area. Measure carefully and down to 1/8 of an inch. Make sure the window trough has been adequately cleaned before sampling.

Step 5: Measure the Sample Area

- Measure width and length (unless template was used). Area must be at least 16 square inches (2 inches by 8 inches). Measure to 1/8 inch.
- Measure exact area after sample is taken.
  - Length of sill or trough between inside edges of tape
  - Tape across width of sill or trough (front to back)
- Do not remove tape until after measurements are taken.

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Step 5: Measure the Sample Area

If a template was used, record the dimensions of the template on the lab collection form. If a template was not used, you must measure the sample area.

- Measure the exact length and width of the sample area with a tape measure after the dust sample has been taken. This allows you to get an accurate measurement without contaminating the sample area.
- Make sure you measure the area inside the tape, not the outside border.
- Always measure to an eighth of an inch (1/8”). Sloppy measurement can produce inaccurate results.

When the wiping is done, measure the area wiped, unless you used a template and know the dimensions already. Measure the length and width of the area wiped.

Note: The ruler does not have additional space between where the measurements begin and the edge of the ruler.

Step 6: Record Sample Area on Forms

- Record measurement on sample collection form and lab chain-of-custody form.
- Calculate area outlined by the tape and record on the sample collection form and lab chain-of-custody form.
- In some cases, conversion from inches to feet will be necessary. To make these calculations easier, measurements should always be converted from fractions to decimals (e.g., 0.5 rather than 1/2).
- Check with analytical laboratory for additional recording requirements.

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•See **Attachment 3-A: Sample Collection Form** and **Attachment 3-B: Completed Sample Collection Form.**
•Instructors should pull out **Attachment 3-C: Worksheet for Performing Mathematical Calculations from Fractions to Decimals** and review with the class. A few simple calculations for the class may be very useful.

Step 7: Clean Up

- Clean template with a clean sampling wipe; place template in a plastic bag for storage.
- Remove materials from site:
  - Gloves, tape from floors and windows, used shoe covers
  - Put items in plastic bag, **NOT** in client's containers
- Clean clothing and remove shoe covers before leaving the work area.
- Clean face and hands with warm, soapy water
  - Use sanitary wipes if no access to warm, soapy water

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Step 7: Clean Up

Sampling materials may be contaminated and therefore must be cleaned or removed from the site.

- Clean the template with a clean wipe and place it in a re-sealable plastic bag for storage. This decontaminates the template between uses and helps avoid contamination when it is not being used. Throw wipe away in trash bag.
- Be sure you have recorded the location and dimensions of the sample area before removing tape.
- Remove gloves, tape, and shoe covers. Throw them away in trash bag.
- Clean face and hands with warm, soapy water. (Use sanitary wipes if no access to warm, soapy water.)

Refer to the *Lead Dust Sampling Technician Field Guide* and **Attachment 3-D: Lead Dust Wipe Checklist,** which summarizes all the steps just described.

Hands-on Activity: Let's Try It

- You are now going to practice taking dust wipe samples.
- Each individual must demonstrate proficiency.
- Follow your instructor's directions for taking samples.
- You can refer to your *Field Guide* or **Attachment 3-D** for a list of key steps.

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Activity: Take samples on a variety of surfaces – windowsills, troughs, and floors.

Avoiding Common Mistakes

- These common mistakes can give incorrect results:
  - Incorrect measurement
  - Contaminated wipe
  - Contaminated gloves
  - Sample area is disturbed
  - Sloppy recording

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If the lead dust sampling technician makes any of the following common mistakes, the technician could get incorrect results:

Incorrect measurement. Small mistakes in reading the tape measure can produce misleading results. Being off by half an inch can make the difference between passing or failing the EPA/HUD standards for lead in dust.

Wipe is contaminated. It is important that the wipe is clean before you collect the sample and that you do not lose any dust before putting the wipe in the tube. Common sources of contamination include the following:

- Wipe touches the floor or window before you place it in the tube.
- Wipe falls to the floor before wiping and you do not get a new one.
- Wiping motions go beyond the template outline or taped area, collecting added dust or debris.
- Wipe is placed on the floor or interior sill while unscrewing the tube cap, collecting dust.

Gloves are contaminated. The gloves can contaminate the sample if they are not clean.

- Gloves are put on too early and you touch dust on other surfaces.
- Gloves are not changed for each sample. Previously used gloves can carry lead dust from the previous sample.

Sample area is disturbed. Contamination may remove or add lead dust to sample area before you wipe the area. The lead dust sampling technician should select a new area to sample.

- Place hand or tape measure inside sample area before you wipe it.
- Place hand inside sample area while taping down template to the floor.
- Slide template across sample area as you tape it down.
- Use template that has not been cleaned.

Sample area is recorded incorrectly. To avoid errors:

- Record measurements for interior sills and troughs immediately after measuring the area.
- Review forms before you submit them to double-check measurements.

How Did It Go?

- Would you like to review and practice any of these steps again?
- Are you ready to do this on your own?

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When you are done sampling, discuss these questions with the large group.

Composite Dust Wipe Sampling

- In composite sampling, samples are collected from common components in different rooms and analyzed as one.
- You may receive a request to take a composite sample during lead dust clearance testing.
- Analytical laboratories often have difficulty processing composite samples. Contact your laboratory before taking any composite samples.

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EPA allows composite samples during lead dust clearance testing. You may receive a request to take a composite sample during lead dust clearance testing. HUD discourages composite sampling for clearance. Analytical laboratories often have difficulty processing composite samples. Contact your laboratory before taking any composite samples.

A composite is a sample that holds up to four dust wipes in one container. Each wipe is called a subsample.
A composite tells you the average amount of lead dust across all the areas you sampled. This provides a measure of average exposure. Subsamples need to be collected from areas of equal size for the results to be an average.
In contrast to single wipe samples, composite samples do not define the location of lead dust, if it exists. Rather, they simply identify that lead dust exists somewhere in the sampled area.

Rules for a Composite Sample

- Measures average amount of lead dust on several surfaces (up to 4) of the same type.
  - Sample container holds up to 4 dust wipes
  - Do not use more than 4 wipes.
  - Do not mix samples from different types of surfaces.
- Sample equal areas with each wipe, and use templates where possible.
- Interior sills or troughs: use smallest sill or trough to set area

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Make sure the areas sampled for each of the subsamples are the same size. If you include wipes that collected dust from areas with varying sizes, you will not get an accurate reading of the average levels. This should not be a problem if templates are used.

- **Floors.** Use a 12” x 12” sample area. Use a template or tape outline.
- **Interior windowsills and window troughs.** Identify the smallest interior windowsill and/or trough you plan to sample. Measure the length and width after you lay down the template or tape and take the dust sample. Use these measurements to outline the same sample area for all of the other interior sills and/or troughs. This will guarantee that all the interior sills or troughs sampled are the same size.

Do not combine subsamples across units. A composite sample can only include dust wipes from a single unit. Do not use more than four wipes in a composite sample. It is difficult for labs to analyze composites holding more than four wipes. Check that your lab has experience analyzing composite wipes.

Composite Sampling Procedures

- Outline all areas to wipe for composite before collecting sample.
- Use a new wipe for each subsample.
- Follow single wipe sampling procedures.
- Use a separate chain of custody form for each composite sample.
- It is not necessary to change gloves between subsamples.

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•Whenever possible, use a template when collecting composite samples. If a template is not available, outline the areas you plan to wipe before collecting the subsamples. Remember that the sample size must be the same for all subsamples included in a composite sample.
•Use a separate wipe for each subsample area wiped.
•Follow the single-wipe sampling procedures.
•You can use one set of gloves for all subsamples in the composite. However, if your glove touches an area outside the sample area, put on a new one.
•After wiping each subsample area, carefully place the wipe into the tube.

Proper Hygiene After Completing Sampling Job

- Hand washing
- Face washing
- Check your clothing and shoes (especially soles) before leaving work site

Summary

- Planning sampling locations and supplies
- Where and when to take dust wipe samples
- Steps in taking a dust wipe sample
- Single-surface and composite sampling
- Clean up after sampling

Attachment 3-A: Sample Collection Form
Field Dust Wipe Sampling Form

Name of Sampling Technician: _____

Name of Property Owner: _____

Property Address: _____ **Apt. #:** _____

Sample Number	Room and Location (name of room used by owner)	Surface Type* (circle one)	Dimensions of Sample Area (in x in)	Area (ft^2)
		FL WS WT		
		FL WS WT		
		FL WS WT		
		FL WS WT		
		FL WS WT		
		FL WS WT		
		FL WS WT		
		FL WS WT		
		FL WS WT		

* Surface types FL = Floor; WS = Windowsill; WT = Window Trough

Total number of samples on this page: _____

Attachment 3-B: Completed Sample Collection Form
Field Dust Wipe Sampling Form

Name of Sampling Technician: Jane White

Name of Property Owner: Smith Family

Property Address: 78 East Main St., Hammond, IN 89898 **Apt. #: 25**

Sample Number	Room and Location (name of room used by owner)	Surface Type* (circle one)	Dimensions of Sample Area (in x in)	Area (ft^2)
98-1	**Upstairs lg bedroom – near doorway**	**FL** WS WT	**$11\frac{5}{8}$" x $12\frac{1}{8}$"**	**.979**
98-2	**Upstairs lg bedroom – selected window in room on west side of room**	FL **WS** WT	**$23\frac{15}{16}$" x $2\frac{7}{8}$"**	**.478**
98-3	**Upstairs sm bedroom – in center of room**	**FL** WS WT	**$11\frac{13}{16}$" x $12\frac{1}{2}$"**	**1.025**
98-4	**Upstairs sm bedroom – only window in room**	FL **WS** WT	**$24\frac{1}{8}$" x $3\frac{1}{4}$"**	**.544**
98-5	**Kitchen – near stove**	**FL** WS WT	**$11\frac{3}{4}$" x $11\frac{3}{8}$"**	**.928**
98-6	**Kitchen – above sink**	FL **WS** WT	**$23\frac{9}{16}$" x 3"**	**.491**
		FL WS WT		
		FL WS WT		
		FL WS WT		

* Surface types FL = Floor; WS = Windowsill; WT = Window Trough

Total number of samples on this page: **6**

Attachment 3-C: Worksheet for Performing Mathematical Calculations from Fractions to Decimals

When recording the sample area on the dust wipe collection form, you may need to perform one or both of the following conversions: converting fractions to decimals and converting inches to square feet. To facilitate the mathematical calculations, fractions should always be converted to decimals first. Refer to the following Table of Common Conversions for assistance.

1. Converting Fractions to Decimals: Table of Common Conversions

Fraction	Decimal
1/8	**0.125**
2/8	**0.250**
3/8	**0.375**
4/8	**0.500**
5/8	**0.625**
6/8	**0.750**
7/8	**0.875**

Fraction	Decimal
1/4	**0.250**
2/4	**0.500**
3/4	**0.750**
1/3	**0.333**
2/3	**0.667**
1/2	**0.500**

2. Converting inches to square feet (ft^2)

If the area you sampled was not a square foot, you will need to convert it to this dimension. One foot equals 12 inches, and 1 square foot equals 144 square inches.

- Record the sample area in inches (in) as opposed to feet (ft).
- Convert the sample area to square inches (in^2). Round the number to a maximum of three decimal places.
- Divide the square inches by 144 to get square feet (ft^2). Round the number to a maximum of three decimal places.

Dimensions of sample area in inches (in)	Length: _____ in Width:_____ in
Multiply length times width to calculate the area in square inches (in^2)	_____ in × _____ in = _____ in^2
Divide the area in square inches (in^2) by 144 to calculate the area in square feet (ft^2)	_____ in^2 ÷ 144 = _____ ft^2

3. Example: Convert an area with length of 20 ½ inches and a width of 5 ¼ inches to square feet.

- Convert fractions to decimals: 20 ½ in → 20.500 in 5 ¼ in → 5.250 in
- Calculate the area in square inches: 20.500 in × 5.250 in = 107.625 in^2
- Calculate the area in square feet: 107.625 in^2 ÷ 144 = 0.747 ft^2

Attachment 3-D: EPA Lead Dust Wipe Checklist

These are the steps involved in taking a lead dust wipe sample. When you are collecting dust samples, you should follow each of these steps. **Note:** The procedure for sampling floors is different than the procedure for sampling windowsills and troughs.

Step	Criteria	√
1.	**Put on disposable shoe covers and lay out the sample area**	
	• Clean the template and properly dispose of wipe	
	• Tape down template; or lay out sample area using tape	
2.	**Prepare the tubes**	
	• Label tube with identification number	
	• Record identification number on sample collection and chain-of-custody forms	
	• Partially unscrew cap of tube and place tube near the area planned for sampling	
3.	**Put on clean gloves**	
4.	**Wipe sample area and place wipe in centrifuge tube**	
4a.	***First swipe (floors):***	
	• Press wipe down firmly	
	• Make overlapping "S"-like motions on the sample surface while moving side-to-Side	
	• Do not cross outer boundary tape or template	
4b.	***Second swipe (floors):***	
	• Fold wipe in half, keeping dust inside, and press wipe down firmly	
	• Make top-to-bottom overlapping "S"-like motions	
	• Do not cross outer boundary tape or template	
4c.	***Third swipe (floors):***	
	• Fold wipe in half, keeping dust inside, and press wipe down firmly	
	• Repeat the wiping procedure one more time (focusing in on corners)	
	• Do not cross outer boundary tape or template	
	• Fold wipe again, keeping all dust inside wipe	
	• Place wipe in sample container tube	
4d.	***Windowsills and troughs (side-to-side)***	
	• Hold fingers together, wipe surface in one direction, and press wipe down firmly	
	• Fold wipe in half and repeat wiping procedure, using a reverse direction	
	• Fold wipe in half again and repeat wiping procedure concentrating on corners	
	• Fold wipe in again and insert into a rigid-walled container	
	• Label the rigid-walled container to identify sample	
5.	**Measure the sample area**	
	• Measure the area inside the tape, not the outside border	

	• Measure to $^{1}/_{8}$ inch	
6.	**Record sample area**	
	• Calculate sample area	
	• Record measurements on the sample collection form	
	• Fill in chain-of-custody form	
7.	**Clean up**	
	• Clean template with new wipe, place template in a plastic bag for storage, and then discard wipe	
	• Put gloves, used shoe covers, and tape from floors and windows into trash bags	
	• Check your clothing and shoes (especially soles) before leaving work site	
	• Wash your face and hands with warm, soapy water or sanitary wipe	

Chapter 4: Selecting a Laboratory

Objectives:	The major objective of this chapter is to teach students to understand the role of the laboratory and what to look for when they select a laboratory. Specific objectives are the following: • Selecting a laboratory recognized by EPA for analysis of lead in dust • Maintaining a chain of custody • Reviewing lab results
Introduction to this chapter:	This chapter is designed to demonstrate to students how to select the appropriate lab for their projects and what they should do with laboratory results.
Activities:	There is one activity in this chapter, an exercise on interpreting lab results. **Exercise: Interpreting Lab Results** Description: This exercise provides sample lab results and asks students to check the math in the lab results and determine whether the sample passed or failed the lead dust clearance testing. Materials: The exercise is in the student manual as **Attachment 4-D.** The answer sheet for this exercise is provided as an attachment to these notes. Steps: 1. **Slide 4-11** instructs students to turn to **Attachment 4-D: Activity — Interpreting Laboratory Results.** 2. Instruct the students to answer the questions on the worksheet. Give them time to complete the activity. They can work individually or in small groups. 3. Go through the questions one at a time, demonstrating the calculations and reasoning required to answer each question. 4. Ask students what mistakes led to incorrect answers and what they think are the most important lessons to learn from the worksheet.
Review:	See **Slide 4-13** for this chapter's review topics. Be sure to answer all student questions about the material before moving on to the next chapter.

Notes:	The chapter also includes resources for students to use in performing measurement conversions, which many students may find difficult. Direct them to **Attachment 4-C: Worksheet for Performing Mathematical Conversions for Dust Samples** for additional resources to help with these potential problems.

ANSWERS—ACTIVITY: INTERPRETING LABORATORY RESULTS (ATTACHMENT 4-D)

Instructions: The purpose of this activity is to test your ability to verify the results received from the laboratory, compare these results to EPA dust clearance standards, and interpret the results. Using the following excerpt from a lead dust clearance test results form, check the laboratory's calculation of the dust lead loading.

Sample #	Location	Surface	Dimensions of Sample Area (ft^2)	Total Lead (µg)	µg/ft^2
92-1	Upstairs bedroom	Floor	1.025	10	9.8
92-2	Upstairs bedroom	Interior windowsill	0.478	150	71.7
92-3	Kitchen, front window	Interior windowsill	0.544	84	154.4
92-4	Kitchen, side window	Window trough	0.928	97	90.0

1. Check the results (µg lead/ft^2) for each sample. If the results are incorrect, provide the correct results in µg lead/ft^2.

   92-1: 10/1.025 = 9.8 µg/ft^2 is correct
   92-2: 150/0.478 = 71.7 µg/ft^2 is incorrect (313.8 µg/ft^2 is the correct result)
   92-3: 84/0.544 = 154.4 µg/ft^2 is correct
   92-4: 97/0.928 = 90.0 µg/ft^2 is incorrect (104.5 µg/ft^2 is the correct result)

2. After verifying the laboratory's results, compare these results to the appropriate EPA recommended guidance. Did the individual samples pass or fail the lead dust clearance test?

92-1: Result 9.8 µg/ft^2	Clearance Standard: 10 µg/ft^2	Pass or Fail? Pass
92-2: Result 313.8 µg/ft^2	Clearance Standard: 100 µg/ft^2	Pass or Fail? Fail
92-3: Result 154.4 µg/ft^2	Clearance Standard: 100 µg/ft^2	Pass or Fail? Fail
92-4: Result 104.5 µg/ft^2	Clearance Standard: 400 µg/ft^2	Pass or Fail? Pass

Chapter 4

Selecting a Laboratory and Interpreting Results

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Objectives

- Select an EPA-recognized lab
- Maintain a chain of custody
- Review and interpret lab results

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After performing lead dust wipe sampling, you will need to submit the samples to a laboratory for analysis and interpret the laboratory results to determine the levels of lead dust in a unit. This chapter describes the steps you will need to take.

At the end of this chapter, you will be able to do the following:

- Select an EPA-recognized laboratory and explain why proper selection is important
- List the important steps to ensure samples are not tampered with or lost, maintaining a chain of custody
- Review and interpret the laboratory results

Selecting a Laboratory

- Submit samples to a lab recognized by EPA's National Lead Laboratory Accreditation Program (NLLAP)
- To locate a lab
  - Call the National Lead Information Center (NLIC) at 1-800-424-LEAD
  - Visit the EPA Web site at www.epa.gov/lead/pubs/nllap.htm
- See the fact sheet "Selecting a Lead Laboratory" at the end of this chapter.

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All samples must be submitted to a laboratory recognized by the EPA's National Lead Laboratory Accreditation Program (NLLAP) to be proficient in lead in dust analysis.

- The NLLAP provides the public with a list of recognized laboratories for analyzing lead in dust samples. You can contact the National Lead Information Center (NLIC) Clearinghouse at 1-800-424-LEAD, or visit the EPA Web site at www.epa.gov/lead/pubs/nllap.htm for an up-to-date list of NLLAP-recognized laboratories. A technical bulletin entitled *Selecting a Laboratory for Lead Analysis: The EPA NLLAP,* EPA 747-G-99-002, April 1999, is also on the EPA Web site.
- For a laboratory to become EPA-NLLAP recognized, it must participate in the Environmental Lead Proficiency Analytical Testing (ELPAT) Program and undergo a quality system audit, including an onsite assessment by a laboratory outside accreditation body participating in the NLLAP, such as the American Industrial Hygiene Association.

It is important to recognize that not every recognized laboratory will meet your needs. Taking the time to select a good laboratory will save you time and effort in the long run. Knowing the costs associated with laboratory supplies and the analysis will also help you calculate the fees you will charge customers. Even if your company has selected a laboratory for you to work with, it is a good idea to ask a few simple, straightforward questions so you can find out whether the laboratory meets some basic quality criteria.

See **Attachment 4-A: Questions to Ask Laboratory**

4-4

Questions To Ask Laboratories

- Tell the lab you will be collecting dust wipe samples for lead.
- Ask:
  - Is the laboratory recognized to analyze for lead in dust by NLLAP?
  - Will sampling materials be provided?
  - What is the turnaround time for analysis?
  - Can the laboratory analyze composite samples? (If the client wants composite samples)
  - What is the cost per sample?

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Review **Attachment 4-A: Questions To Ask Laboratory.**

Quality Control in the Field

- Submit blank wipe samples.
- Duplicate, or side by side sampling can be used to check lab consistency.
- Review all of your sample collection and chain-of-custody forms.
- Carefully review all lab results.

Lead dust clearance testing and analysis require a great deal of care and precision by both you and the laboratory. Follow the steps above to help control the quality of the lab results. Each step is discussed in further detail on the following slides.

4-6

Review Your Sample Collection Form

- Confirm all information is recorded clearly and correctly.
  - Sample numbers
  - Sample locations
  - Sample dimensions
- Keep a copy for your records and note blanks.

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In **Chapter 3,** we described how to record sample information on the sample collection form clearly and accurately. Before you send the samples to the laboratory, you should check your sample collection form to confirm that all of the following information is recorded clearly and correctly.

- **Sample numbers -** Samples should be numbered sequentially, in the order you took them. (This information must be included accurately on the laboratory chain-of-custody form.)
- **Sample locations -** These should be precise. For example, "left window on back wall in master bedroom" is better than "bedroom window."
- **Sample dimensions for dust wipe samples -** As discussed in **Chapter 3,** these dimensions are extremely important and should be recorded to the nearest 1/8 of an inch.

After completing the form, it is essential that you keep a copy for your records and to note the ID numbers of your blank samples.

Chain of Custody

- A record of each person who handles the sample from the time it is collected until it is sent to the lab.
- The lead dust sampling technician is responsible for maintaining chain of custody until he or she transfers custody of the samples.
- Include information on sampling form
- A sample Chain of Custody form is shown on the next page, and as an attachment to this chapter.

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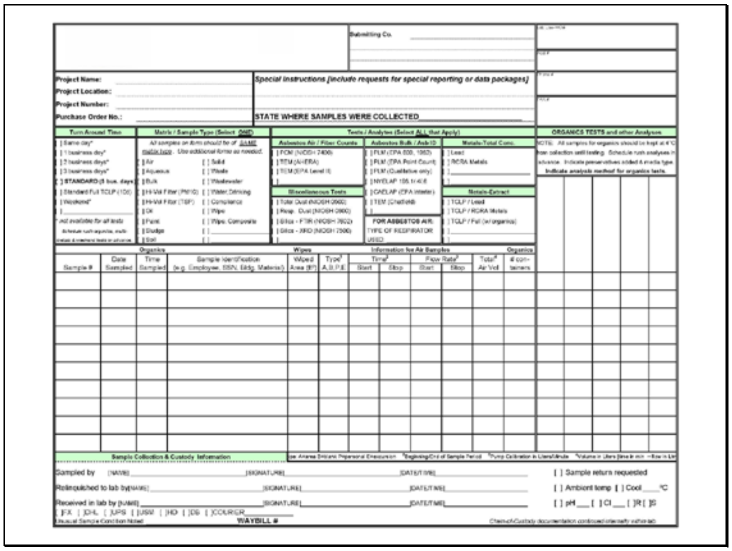
It is important that samples are not lost before or during the analysis process. To trace the path of the sample, you should establish a "chain of custody." This simply means that every person who handles the sample must sign and date a form.

Who is in the chain of custody? People in the chain of custody may include:

- Lead dust sampling technician
- Technician's supervisor
- Person packing the samples for shipment
- Person picking up and shipping the samples
- Person receiving the shipment at the laboratory

Maintaining the chain of custody - Ensure that the chain of custody is maintained from when you take the samples until you transfer custody of the samples.

- Space for documenting the chain of custody may be included as part of the sample collection form or you may use a separate form. There should be enough space for each individual handling the sample to sign and date the form – 5 to 7 lines should be sufficient.
- You should also keep a copy of any shipping or mailing forms documenting when the samples were sent to the laboratory.
- You should send the package with delivery confirmation and return receipt requested, or the equivalent shipping record.


Submitting Co.
Project Name:
Project Location:
Project Number:
Purchase Order No.:
Special Instructions (include requests for special reporting or data packages)
STATE WHERE SAMPLES WERE COLLECTED
Sample Collection & Custody Information
Sampled by
Relinquished to lab by
Received in lab by
WAYBILL #

This form appears at the end of this chapter.

4-9

Evaluating Laboratory Results for Single Samples

- Check for appropriate units (μg/ft^2)
- Compare results to the EPA/HUD clearance standards for lead dust:
  - Floors < 10 μg/ft^2 **passes**
  - Sills < 100 μg/ft^2 **passes**
  - Troughs < 400 μg/ft^2 **passes**

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When you receive the results from the laboratory, you must interpret them to determine whether they pass or fail clearance. This section describes dust lead hazards and the process used to evaluate the sample results. Specifically, you will need to evaluate the laboratory results, converting them if necessary, and comparing them to the Federal or State standards.

To evaluate the laboratory results, you may need to take the steps listed below. These steps should be implemented as follows:

Step 1: Check the units. If results are not reported in μg/ft^2, use the conversion table (see **Attachment 4-C: Worksheet for Performing Mathematical Conversions for Dust Samples**).

Step 2: Compare the results to the EPA clearance standard for lead dust. Once you have made the necessary conversion, you can compare the laboratory results to the appropriate EPA clearance standard for lead dust. EPA clearance standards have been developed for lead dust on floors, interior windowsills, and window troughs. It is important to recognize that the levels for lead dust are different for each of these three surfaces. If test results equal or exceed the standards, the unit, worksite, or common area represented by the sample fails the dust clearance test.

Activity: Interpreting Laboratory Results

- Turn to **Attachment 4-D**
- Answer the questions.
- Be prepared to explain your answers.

Evaluating Laboratory Results for Composite Samples

Location	2 Subsamples	3 Subsamples	4 Subsamples
Floors	10 µg/ft^2	7 µg/ft^2	5 µg/ft^2
Sills	100 µg/ft^2	67 µg/ft^2	50 µg/ft^2
Troughs	400 µg/ft^2	267 µg/ft^2	200 µg/ft^2

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Composite samples determine the average of the dust lead levels on the surfaces that make up the composite.
To minimize the chance that any individual surface included in the composite does not fail clearance, composite samples that contain more than two subsamples are compared to more stringent standards than are single-surface samples.

4-12

Avoiding Common Mistakes

- Mistaking weight (mass) for surface loading by using incorrect units (μg for μg/ft^2)
- Not submitting blank samples
  - Labeling or recording in the sample log blank samples as blanks
- Not maintaining a chain of custody

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Listed above are some common mistakes you might make while performing any of the activities listed on the previous slide.

- **Mistaking the units.** One common mistake is not understanding the units of measurement provided in the lab report. When the results come from the laboratory, check whether they are provided in μg or μg/ft^2. If they are in μg, you must convert them to μg/ft^2 before recording them on your report and interpreting results. Discuss with your laboratory how results are reported.

- **Failing to submit blank samples.** Another common mistake is not submitting blank samples. Without this mechanism, you have no way of verifying if the laboratory results were uncontaminated, or that you used good sampling techniques. Submit one blank sample for every unit sampled.

- **Failing to maintain the chain of custody.** This is your only mechanism to track the handling of the sample. The chain-of-custody form must be maintained from the time you take the dust wipe sample until you transfer custody. Re-sampling is recommended if this document is not maintained.

Summary

- Select an EPA-recognized lab.
  - Call 1-800-424-LEAD
  - Visit www.epa.gov/lead/pubs/nllap.htm
  - Ensure that the lab is EPA-recognized for the analysis of lead in dust.
- Maintain a chain of custody.
- Interpret lab results.

Attachment 4-A: Questions to Ask Laboratory

Is the laboratory recognized by NLLAP?	All samples must be analyzed by an NLLAP laboratory. You can contact the NLIC Clearinghouse at 1-800-424-LEAD for an up-to-date list of NLLAP-recognized laboratories. Even after selecting a laboratory, you should check the laboratory's accreditation every 6 months.
What is the turnaround time for sample analysis?	The laboratory turnaround time is an important factor; labs usually provide results within 1 to 3 days. A faster turnaround time allows you to be more responsive to your client but may cost more money.
What is the cost per sample?	Prices can vary depending on how quickly you want the results. A 6-hour turnaround will cost more than samples analyzed over a few days.
Will the laboratory provide sampling materials?	Some laboratories will provide you with the materials necessary to perform sampling. You may want to select a laboratory that provides these materials because laboratory-supplied materials and forms can help minimize potential errors in the analysis and recordkeeping.
Can the laboratory analyze composite samples?	It is good practice to check in advance the laboratory's capabilities in analyzing composite samples, if your client wants you to collect composite samples. Some laboratories do not offer this service.
Does the laboratory perform all the necessary mathematical calculations?	The Federal guidance is provided in µg/ft². Depending on the size of the sample or sample area, some mathematical calculations may need to be performed to convert the sample area to 1 square foot. Selecting a laboratory that will perform this calculation for you can reduce the possibility of mathematical errors.

Blank Chain of Custody Form

	Submitting Co. _____	Lab Use-WO#
		Acct #
Project Name: _____	***Special Instructions [include requests for special reporting or data packages]***	Phone #
Project Location: _____		FAX #
Project Number: _____		
Purchase Order No.: _____	**STATE WHERE SAMPLES WERE COLLECTED**_____	

Turn Around Time

[ ] Same day*
[ ] 1 business day*
[ ] 2 business days*
[ ] 3 business days*
[ ] STANDARD (5 bus. days)
[ ] Standard Full TCLP (10d)
[ ] Weekend*
[ ] _____
* *not available for all tests*
Schedule rush organics, multi-metals & weekend tests in advance.

Matrix / Sample Type (Select ONE)

All samples on form should be of SAME matrix type. Use additional forms as needed.

[ ] Air
[ ] Aqueous
[ ] Bulk
[ ] Hi-Vol Filter (PM10)
[ ] Hi-Vol Filter (TSP)
[ ] Oil
[ ] Paint
[ ] Sludge
[ ] Soil
[ ] Solid
[ ] Waste
[ ] Wastewater
[ ] Water,Drinking
[ ] Compliance
[ ] Wipe
[ ] Wipe, Composite
[ ] _____
[ ] _____

Tests / Analytes (Select ALL that Apply)

Asbestos Air / Fiber Counts
[ ] PCM (NIOSH 7400)
[ ] TEM (AHERA)
[ ] TEM (EPA Level II)
[ ] _____

Asbestos Bulk / Asb ID
[ ] PLM (EPA 600, 1982)
[ ] PLM (EPA Point Count)
[ ] PLM (Qualitative only)
[ ] NYELAP 198.1/.4/.6
[ ] CAELAP (EPA Interim)
[ ] TEM (Chatfield)
[ ] _____

FOR ASBESTOS AIR:
TYPE OF RESPIRATOR USED: _____

Metals-Total Conc.
[ ] Lead
[ ] RCRA Metals
[ ] _____
[ ] _____

Miscellaneous Tests
[ ] Total Dust (NIOSH 0500)
[ ] Resp. Dust (NIOSH 0600)
[ ] Silica - FTIR (NIOSH 7602)
[ ] Silica - XRD (NIOSH 7500)
[ ] _____

Metals-Extract
[ ] TCLP / Lead
[ ] TCLP / RCRA Metals
[ ] TCLP / Full (w/ organics)
[ ] _____
[ ] _____

ORGANICS TESTS and other Analyses

NOTE: All samples for organics should be kept at 4°C from collection until testing. Schedule rush analyses in advance. Indicate preservatives added & media type.

Indicate *analysis method* for organics tests.

Organics				Wipes		Information for Air Samples					Organics					
Sample #	Date Sampled	Time Sampled	Sample Identification (e.g. Employee, SSN, Bldg, Material)	Wiped Area (ft²)	Type[1] A,B,P,E	Time[2] Start	Time[2] Stop	Flow Rate[3] Start	Flow Rate[3] Stop	Total[4] Air Vol	# con-tainers					

Sample Collection & Custody Information

[1]Type: A=area B=blank P=personal E=excursion [2]Beginning/End of Sample Period [3]Pump Calibration in Liters/Minute [4]Volume in Liters [time in min * flow in L/m

Sampled by [NAME] _____ [SIGNATURE] _____ [DATE/TIME] _____

Relinquished to lab by [NAME] _____ [SIGNATURE] _____ [DATE/TIME] _____

Received in lab by [NAME] _____ [SIGNATURE] _____ [DATE/TIME] _____

[ ]FX [ ]DHL [ ]UPS [ ]USM [ ]HD [ ]DB [ ]COURIER_____

Unusual Sample Condition Noted: _____ **WAYBILL #**

[ ] Sample return requested

[ ] Ambient temp [ ] Cool ____°C

[ ] pH ___ [ ] Cl ___ [ ]R [ ]S

Chain-of-Custody documentation continued internally within lab.

Attachment 4-C: Worksheet for Performing Mathematical Conversions for Dust Samples

Unit of Measurement	Symbol	Unit of Weight	Symbol
Inches	in	Micrograms	µg
Square inches	in^2	Micrograms per square foot	$µg/ft^2$
Feet	ft		
Square feet	ft^2		

1. Convert the sample area to square feet (ft^2)

If the area you sampled was not a square foot, you will need to convert it to this dimension. One foot equals 12 inches, and 1 square foot equals 144 square inches.

- Record the sample area in inches (in) as opposed to feet (ft).
- Convert the sample area to square inches (in^2). If you have a decimal, round the number to three decimal places.
- Divide the square inches by 144 to get square feet (ft^2). If you have a decimal, round the number to three decimal places.

Dimensions of sample area in inches (in)	Length: _____ in Width: _____ in
Multiply length times width to calculate the area in square inches (in^2)	_____ in × _____in = _____ in^2
Divide the area in square inches (in^2) by 144 to calculate the area in square feet (ft^2)	_____ in^2 ÷ 144 =_____ft^2

2. Convert the results to micrograms per square foot ($µg/ft^2$)

After you have converted the sample area to square feet, you need to find the amount of lead dust contained in that area. The micrograms per square foot ($µg/ft^2$) describe the quantity of lead dust contained in a 1 square-foot area.

- Divide the amount of lead (µg) by the area (ft^2).

Dimensions of sample area in square feet (ft^2)	Area = _____ ft^2
Quantity of lead in micrograms (µg)	Lead = _____ µg
Divide micrograms (µg) by square feet (ft^2) to calculate micrograms per square foot ($µg/ft^2$)	_____ µg ÷_____ ft^2 = _____ $µg/ft^2$

Attachment 4-D: Activity — Interpreting Laboratory Results

Instructions: The purpose of this activity is to test your ability to verify the results received from the laboratory, compare these results to the EPA dust clearance standards, and interpret the results. Using the following excerpt from a lead dust clearance test results form, check the laboratory's calculation of the weighted lead dust sample.

Sample #	Location	Surface	Dimensions of sample area (ft^2)	Total lead (µg)	µg/ ft^2
92-1	Upstairs bedroom	Floor	1.025	10	9.8
92-2	Upstairs bedroom	Interior windowsill	0.478	150	71.7
92-3	Kitchen, front window	Interior windowsill	0.544	84	154.4
92-4	Kitchen, side window	Window trough	0.928	97	90.0

1. Check the results (µg lead/ft^2) for each sample. If the results are incorrect, provide the correct results in µg lead/ft^2.

2. After verifying the laboratory's results, compare these results to the appropriate EPA lead dust clearance standard. Did the individual samples pass or fail the lead dust clearance test?

EPA Clearance Standards for Lead Dust

Floors: < 10 µg/ft^2
Interior windowsills: < 100 µg/ft^2
Window troughs: < 400 µg/ft^2

92-1: Result _____	Clearance Standard: _____	Pass or Fail? _____
92-2: Result _____	Clearance Standard: _____	Pass or Fail? _____
92-3: Result _____	Clearance Standard: _____	Pass or Fail? _____
92-4: Result _____	Clearance Standard: _____	Pass or Fail? _____

Chapter 5: Writing and Delivering the Report

Objectives:	This chapter will teach students how to complete reports of their lead dust clearance tests. By the end of the chapter, students will be trained to: • List the key contents of a lead dust clearance test report
Introduction to this chapter:	In this chapter, students will learn to present their findings from lead dust clearance tests to clients in a manner that is clear, concise, and easy for untrained homeowners to understand.
Activities:	There is one exercise in this chapter. **Activity: Review a Blank and Sample Report (Attachment 5-A and B)** Description: In this activity, take several minutes to review the attached blank and completed dust sampling reports. Walk through each section of the completed report and answer questions as appropriate.
Review:	The review information for this chapter is included on **Slide 5-7**.
Notes:	Point out the handout *Renovate Right: Important Lead Hazard Information for Families, Child Care Providers and Schools* in **Appendix B.** Lead dust sampling technicians can refer clients to this information.

Chapter 5

Writing the Report

Lead Dust Sampling Technician
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Objectives

- List the items that make up a complete lead dust clearance test report.
- Make the report easy for the client to understand.

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At the end of the chapter, students will be able to:

- List the key contents of a complete lead dust clearance test report
- Describe ways to make the report easy to read
- Respond appropriately to questions that clients may ask upon receiving their report

Contents of Report – EPA RRP

- Cover Page
- Summary of Sampling Results
- Visual Inspection Results
- Laboratory Analytical Results
- Renovate Right Pamphlet
  - (**Appendix B**)

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These are the six elements of the Lead Dust Clearance Test Report.
Blank forms that can be used for the Cover Page, Summary of Sampling Results, and Visual Inspection Results are provided in **Appendix B** of this course.
A copy of the *Renovate Right: Important Lead Hazard Information for Families, Child Care Providers and Schools* pamphlet is also included in **Appendix B.**

Contents of Report – HUD LSHR

- Address of property and if multifamily, specific units and common areas affected
- Date of clearance exam
- Name, address and signature of person performing clearance including certification number
- Visual inspection results

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Because HUD has more extensive visual inspections requirements, than does the EPA rule, HUD requires more information regarding the details of a lead dust clearance test report.

Contents of Report – HUD LSHR (Cont.)

- Dust sampling results
- Name and address of each laboratory that analyzed samples
- Start and completion dates of work performed
- Detailed written description of methods used during work and specific, detailed locations where work occurred
- If soil hazards are corrected, description of location.

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Because HUD has more extensive visual inspections requirements, than does the EPA rule, HUD requires more information regarding the details of a lead dust clearance test report.

Activity: Writing the Report

- Refer to **Attachment 5-A and 5-B**
- Review the blank and completed Lead Dust Clearance reports

Summary

- The items that make up a complete lead dust clearance test report
- How to make a report easy for a client to understand

Attachment 5-A: Sample Lead Dust Clearance Test Report

The following report is a sample lead dust clearance test report from a small HUD funded rehabilitation job (less than $5,000/unit) in a unit that involved window replacements in the small bedroom and kitchen of a single-family home that is available for rent. The lead dust clearance test report covers lead dust clearance testing of the worksite.

LEAD DUST CLEARANCE TEST REPORT
General Information

Date of Lead Dust Clearance Test:	8/5/09
Lead Dust Sampling Technician:	Jane White
Property Address:	80 East Main St. Hammond, IN 89898
Client Name and Address:	Smith Family 80 East Main St. Hammond, IN 89898
Laboratory Name and Address:	Analysis Services, Inc. 990 45th St., Suite 500 Gary, IN 44444
Telephone Number:	222-222-2222
NLLAP Number:	IN 999999

Summary of Lead Dust Clearance Test Results

This unit failed the lead dust clearance testing portion of the lead dust sampling examination. Areas represented by the failed samples should be re-cleaned.

Lead dust above HUD/EPA clearance standards was found in the following areas:

Location	Surface	µg lead/ft^2
Small bedroom	Side facing window (C-1)—windowsill	600
Small bedroom	Floor	200
Kitchen	Window above sink (A-1)-- windowsill	525

Signature: *Jane White*

Date: *8/12/09*

Summary of Hazard Reduction Activities

Name of Firm	ABC Renovations
Address of Firm	123 Main Street East Chicago, IN 12345
Supervisor Name	John Brown #1634
Supervisor Certification Number	1634
Start and Completion Date of Hazard Reduction or Completion Activity	8/4/09 to 8/5/09

Description of Hazard Reduction Activities and Areas Addressed:

Location	Activity
Kitchen	Replaced A-1 window with new, vinyl-clad window
2nd floor small bedroom	Replaced C-1 and C-2 windows with new, vinyl-clad windows

Description of work	The supervisor was present on the job site when work was being performed. Workers used lead-safe work practices. Plastic sheeting covered a 5-foot area on the ground outside under the windows being replaced and on the floor inside. Signs were posted at the doors to the bedroom and kitchen. Occupants were not allowed in the kitchen and bedroom and the outside work area during this activity. The window frame was misted prior to tear-out. After removal, workers wrapped the old windows in plastic sheeting and picked up debris on the plastic immediately and bagged it. The plastic sheeting was carefully gathered up and bagged for disposal. Workers replaced their disposable booties when leaving the work area for lunch and breaks. Respirators were not necessary. The new windows were installed and a clearance examination was requested.

Part I. VISUAL INSPECTION RESULTS FORM

Date of Lead Dust Sampling:	*8/5/09*
Lead Dust Sampling Technician:	*Jane White*
Client:	*Smith Family*
Property Address:	*80 East Main St.* *Hammond, IN 89898*

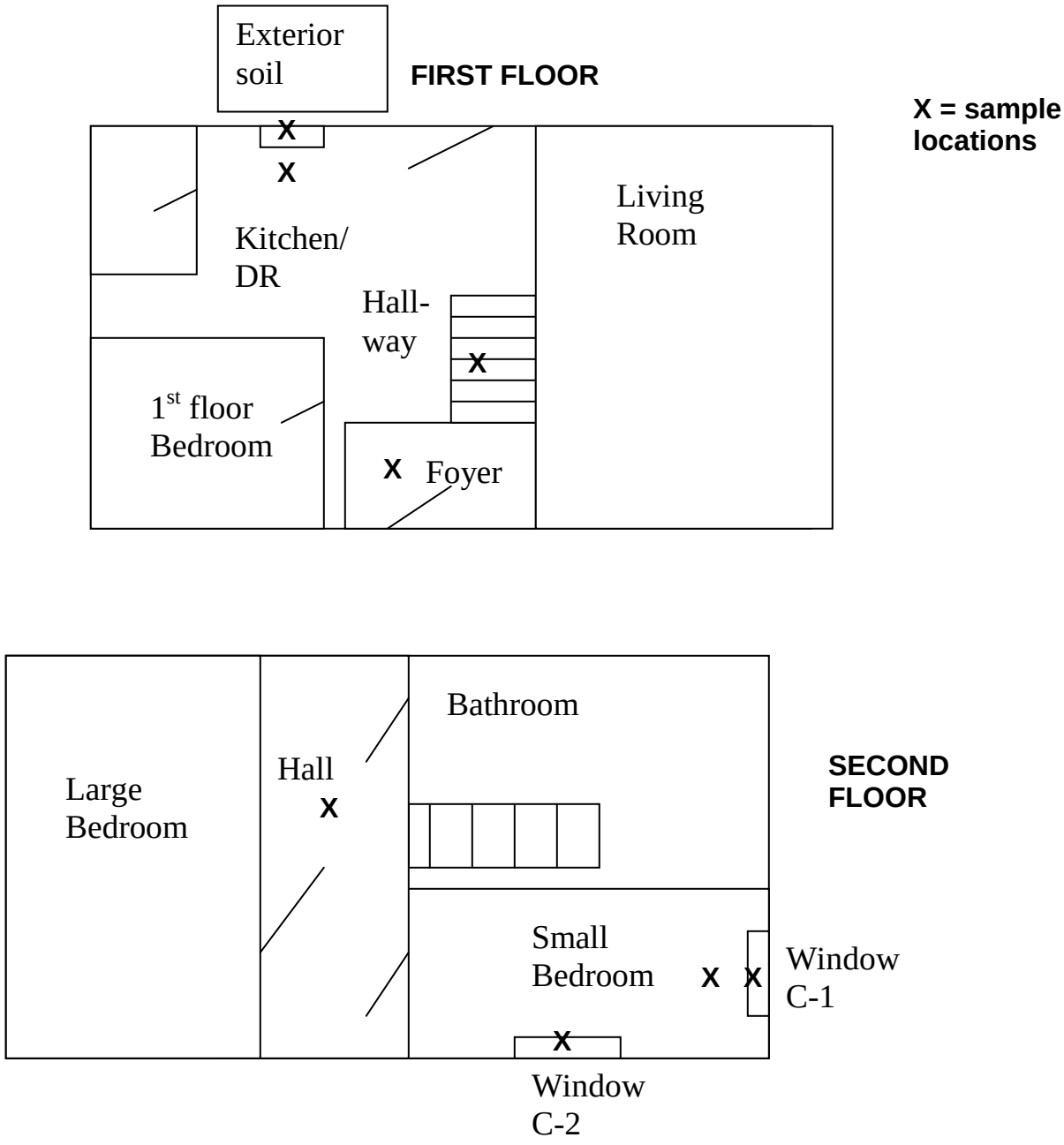
Visual Inspection of the Work Area

Work Area	Deteriorated Paint	Debris	Visible Dust	Notes	Pass/ Fail
Small bedroom					*Pass*
Kitchen					*Pass*
First floor hallway					*Pass*
Staircase					*Pass*
Second floor hallway					*Pass*
Exterior soil under kitchen window					*Pass*
Exterior soil under bedroom window					*Pass*

LEAD DUST CLEARANCE TEST RESULTS FORM

Date of Lead Dust Clearance Test:	*8/5/09*
Lead Dust Sampling Technician:	*Jane White*
Client:	*Smith Family*
Property Address:	*80 East Main St.* *Hammond, IN 89898*

Sample #	Location	Surface	Dimensions of sample area	µg Lead/ft^2	Pass/Fail
1-2	*Upstairs small bedroom*	*Front facing window (C-2)- windowsill*	*4" x 18"*	*17*	*Pass*
1-3	*Upstairs small bedroom*	*Floor under C-1 window*	*12" x 12"*	*200*	*Fail*
1-4	*Upstairs small bedroom*	*Side facing window (C-1)- windowsill*	*4" x 18"*	*600*	*Fail*
2-1	*Second floor hallway, 3 feet from newel post*	*Floor*	*12" x 12"*	*5*	*Pass*
3-1	*Staircase 5th step from bottom*	*Floor*	*12" x 12"*	*9*	*Pass*
4-1	*Kitchen*	*Floor under A-1 window*	*12" x 12"*	*8*	*Pass*
4-2	*Kitchen*	*Window above sink (A-1)- windowsill*	*4" x 18"*	*525*	*Fail*
5-1	*First floor, entry foyer, 2 feet inside front door*	*Floor*	*12" x 12"*	*6*	*Pass*


Exterior soil
FIRST FLOOR
X = sample locations
X
X
Kitchen/ DR
Living Room
Hall- way
X
1st floor Bedroom
X
Foyer
Large Bedroom
Hall
X
Bathroom
Small Bedroom
X
X
Window C-1
X
Window C-2
SECOND FLOOR

Understanding Your Report

1. The Summary Results section lists all of the areas that failed the lead dust clearance test. The areas represented by the sample needs to be re-cleaned to see if the cleaning removed the contaminated dust. Deteriorated painted surfaces should be repaired using interim controls or abatement techniques.

   For written information on how to address lead hazards, call the National Lead Information Center Clearinghouse at 1-800-424-Lead (1-800-424-5323). You may consider hiring a risk assessor to evaluate lead hazards in your home and recommend a lead hazard control plan. Risk assessors can be located through the Lead listing at 1-888-Leadlist (1-888-532-3547).

2. The laboratory result forms attached to the report list the analyst, all of the areas sampled inside and outside the building and the laboratory analysis results for each sample.

3. The lead dust clearance test results are expressed in micrograms per square foot ($\mu g/ft^2$); soil samples are expressed in micrograms per gram ($\mu g/g$).

4. Areas that failed the lead dust clearance test showed dust lead levels above EPA clearance standards for lead dust. The guidance that was used during this lead dust clearance test is as follows:

EPA Clearance Standards for Lead Dust

Carpeted and uncarpeted floors: $< 10\ \mu g/ft^2$
Interior window sill (stool): $< 100\ \mu g/ft^2$
Window trough: $< 400\ \mu g/ft^2$

Chapter 6: Putting the Skills Together

Objectives:	This chapter is designed to help students apply all of the information they have been given in a hands-on activity. The objectives are as follows: - Demonstrate an understanding of the skills and information taught in the class: • Choosing appropriate sampling location • Taking lead dust samples • Interpreting results
Introduction to this chapter:	In this chapter, students will learn to put all the skills they have learned throughout the day into practice.
Activities:	**NOTE**: HUD has different requirements than EPA for clearance. Although EPA's post-renovation clearance protocol is similar to HUD's allowed protocol for worksite-only clearance, HUD has additional requirements to use this sampling strategy. Although the sampling requirements are very important for Federally-funded renovation activity, these units will represent a relatively small percentage of all renovation projects performed nationwide. Because most of the renovation jobs that are expected to occur in U.S. housing will not be funded with Federal housing assistance, details on HUD sampling are provided in the HUD sampling appendix. In addition, the course includes a HUD-specific Activity 1 and 3. Activity 2, Dust Wipe Sampling, is the same regardless of the regulation. The HUD-specific Activities can be found at Attachment 6-A and 6-B and the answer key is included at the end of these notes. All LDSTs should discuss sampling plans with the renovator before work begins; with particular attention to whether the project is receiving Federal housing assistance, so the proper sampling strategy can be used to comply with the Lead Safe Housing Rule. The activities outlined below are specific to the EPA RRP and will be applicable for most training classes. **Activity 1: Where To Take Samples for Renovated Areas** Description: This exercise provides details of a home renovation and asks students to determine which areas of the home need to be sampled as a result. The answers to the four questions posed are included at the end of these Instructor Notes. Students should take no more than 15 minutes to complete this exercise. The next 10 minutes should be spent discussing the correct answers with the class. Materials: Home renovation description sheet with questions and home diagram. These documents are provided in **Attachment 6-A.** **Activity 2: Dust Wipe Sampling** Description: In this exercise, each student will take a lead dust wipe sample

following the protocol discussed in Chapter 3.

Put students into different groups than they were in the first time this activity was performed in Chapter 3. If a student was only able to sample a floor during the first hands-on activity, make certain that he or she is put into a group that will not be sampling floors again. It is imperative that the Instructor ensures every student has become proficient at all areas of sampling, from Step 1: Layout through Step 7: Cleanup. If any student is unclear on any step of the sampling process or on a particular sampling area, such as a window trough, this exercise is the time to remedy all concerns.

Materials:

- Disposable lead dust wipes (individually wrapped)
- Disposable gloves
- Disposable shoe covers
- Sample tubes with caps
- Reusable templates (can be made or purchased)
- Masking or painter's tape
- Ruler
- Sample collection forms
- Chain-of-custody forms
- Markers, trash bags, labels, pens, re-sealable storage bags
- Calculator
- Sanitary wipes

Note: To be effective, at most, a 6:1 student-to-teacher ratio is recommended. The instructor may want to bring in additional qualified instructors to oversee this activity.

Steps:

1. Distribute sampling materials and a blank sample collection form to the students.
2. Divide students into groups of three or four individuals, depending on class size.
3. Using the templates and dust sampling materials, have each student practice lead dust wipe sampling techniques and complete the blank sample collection form.
4. Encourage students to take samples on a variety of surfaces – windowsills, troughs, and uncarpeted floors.
5. Go to each of the groups and review the students' sampling, measuring, and recording techniques. Correct any errors and answer any questions students may have.
6. Have students briefly discuss any problems they encountered and ask any relevant questions.

Activity 3: Interpreting Laboratory Results

Description: This exercise provides sample lab results and asks students to check the math in the lab results and determine whether the sample passed or

	failed the lead dust clearance testing. Materials: The exercise is provided as **Attachment 6-B.** The answer sheet for this exercise is provided as an attachment to these notes. Steps: 1. Turn to **Attachment 6-B: Activity — Interpreting Laboratory Results.** 2. Instruct the students to answer the questions on the worksheet. Give them time to complete the activity. They can work individually or in small groups. 3. Go through the questions one at a time, demonstrating the calculations and reasoning required to answer each question. 4. Ask students what mistakes led to incorrect answers and what they think are the most important lessons to learn from the worksheet. **Activity 4: Translating Results into a Written Report** Description: This exercise uses the sample lab results from the previous activity and translates the findings into a written report introduced in Chapter 5 (**Writing the Report**). Materials: The exercise is provided as **Attachment 6-C.** An example of the completed report is provided below. Steps: 1. Review Chapter 5 and the six elements of the written report, if necessary. 2. Turn to **Attachment 6-C: Activity — Translating Results into a Written Report** 3. Instruct the students to use the results from the previous activity (**Interpreting Laboratory Results**) and complete the report as shown in Chapter 5. 4. Review the completed report and address any issues.
Review:	Review Chapter 5 (**Writing the Report**) in order to re-familiarize yourself with the requirements of the written report.
Notes:	There are a number of useful resources included in **Appendices B and C.** Encourage students to look over these—a completed clearance report and a clearance report template—and familiarize themselves with the types of information they will need to provide to their clients as they assess properties. Take questions from students about the format and content of these forms.

Answers to Activity 1: Where to Take Samples for Renovated Areas

A homeowner renovated her house and she chose, under the EPA RRP regulation, to have clearance conducted in her home, instead of cleaning verification. This language was inserted in the contract at the beginning of the project. After reading the description about each type of renovation performed, decide where and whether or not samples should be taken inside the house by marking an "X" on the floor plan (see floor plan on following page).

1. The kitchen cabinets were replaced. Next to the cabinets, a stove and the 18-inch-square metal wall plate that held the exhaust vent for the stove were removed. A plastic barrier was hung between the kitchen and the hallway during this project.
2. In an effort to have a more energy-efficient house, both windows in bedroom 2 were replaced with triple-paned, argon-gas windows. The contractor erected a barrier at the existing doorway to the bedroom.
3. The homeowner's company decided its employees could reduce both fuel costs and pollution by allowing them to work from home more often. As a result, the homeowner needed to create an office space. She decided to split her spacious upstairs bedroom into a smaller bedroom and an office. She had a wall constructed in the middle to divide the room. The original bedroom door was removed and two new doors were installed to allow access into each room. A window was installed in the office. The renovator considered both new rooms as a single work area and only erected a barrier between the bedroom/office and the hall.
4. The bathroom floor, original since the house was built in the 1960s, was replaced with new ceramic tile. Both the existing floor and the existing walls were ceramic tile.

Answers:

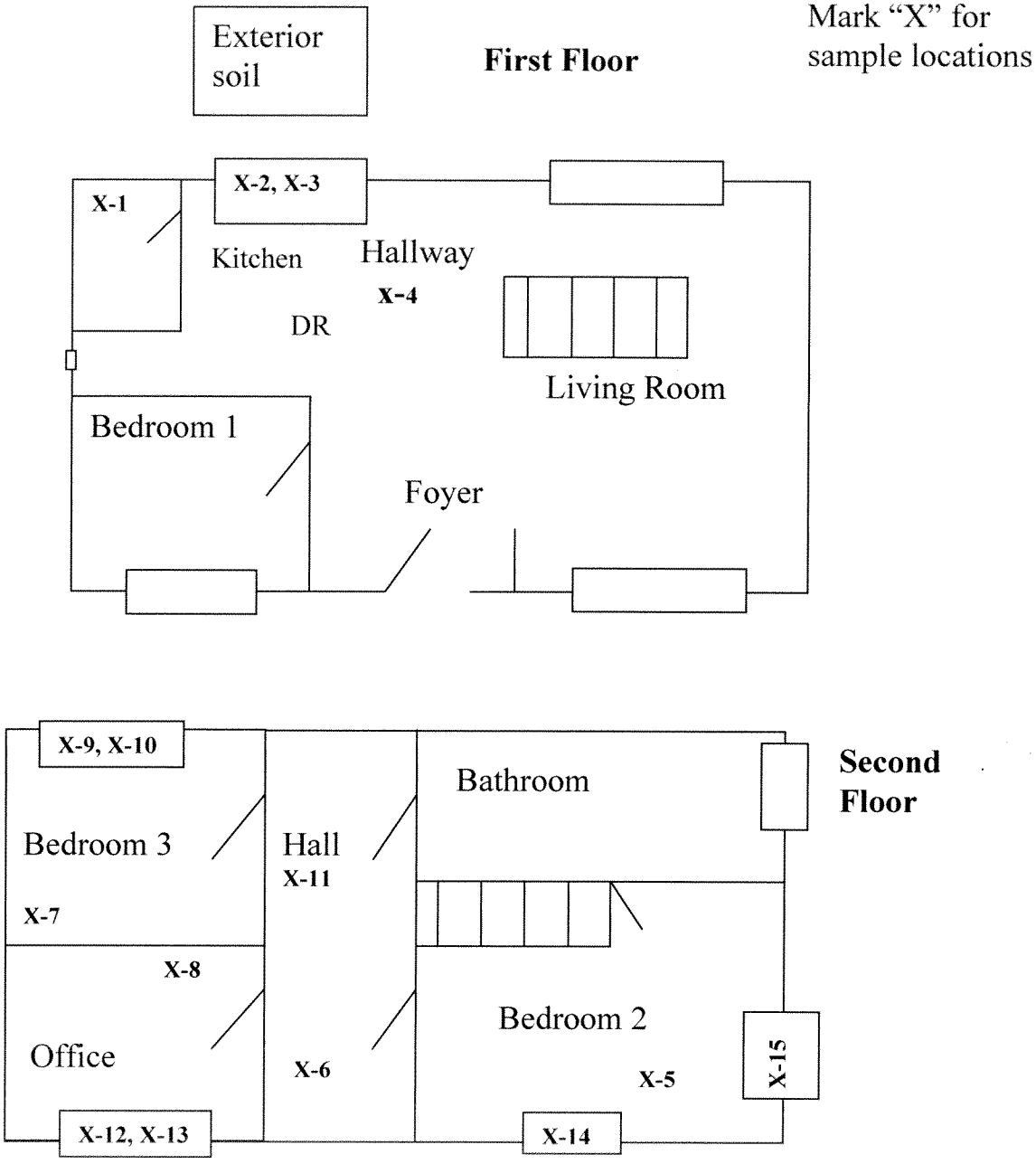
1. The work area consists of the kitchen. You should take a floor sample from the kitchen floor near where the cabinets were removed (X-1), because that is where the most lead dust was created. Because there is only one window in the work area, you should take the windowsill (X-2) and the window trough (X-3) samples from this window. The "outside the work area" sample should be taken from the hallway (X-4), since the barrier was constructed between the kitchen and the hallway. The removal of the wall plate does not affect the analysis; the work in the kitchen was within that one room and conducted as part of a single project.

   If the owner had not included the removal of the stove and the wall plate, how would that have affected clearance? Answer: It would not have any effect; the cabinet replacement would still require clearance. Follow-up question: If the owner decided a month later to remove the stove and the wall plate, what would be required for clearance of that project? Answer: The plate is 18 inches on a side; with paint a few inches around it to be disturbed during removal. The paint to be removed would be a square about 2 feet on a side, or about 4 square feet. Under the EPA RRP regulation, there would be no need for clearance, because the amount of paint disturbed is within the EPA regulation's 6 square feet limit for minor repair and maintenance activities. Note that, if the work is done under the HUD rule, this project would need to be cleared, because the paint disturbance of 4 square feet is above HUD's de minimis threshold of 2 square feet.

2. The work area consists of Bedroom 2. You should take the floor sample from the bedroom floor near the windows (X-5). Since the barrier was constructed at the existing doorway, the "outside the work area" sample should be taken from the Hall near the door (X-6). In this room, even though the windows are new, samples should be taken from both the sill and the trough of each window (X-14, X-15), because wall paint and lead-contaminated dust could be disturbed during installation of the windows. As a point of discussion, to keep the exercise within the class time available, just the first 13 samples are shown in the answer key and the lab report.

3. In this example, work area is Bedroom 3 and the Office. Since there is more than one room, but fewer than four rooms, within the work area, both rooms must be sampled. X-7 is the floor sample in the Bedroom and X-8 is the floor sample from the Office. A windowsill sample (X-9) and window trough sample (X-10) should be collected from the Bedroom window. Since a window was installed in the office, two window samples, a windowsill sample (X-12) and a window trough sample (X-13), are required. On this job, the barrier was constructed between the original bedroom (now Bedroom 3 and the Office) and the Hall, so the "outside the work area" sample should be taken from the Hall (X-11).

4. No samples required since no lead-based paint was disturbed.


Exterior soil
First Floor
Mark "X" for sample locations
X-1
X-2, X-3
Kitchen
Hallway
X-4
DR
Living Room
Bedroom 1
Foyer
X-9, X-10
Bathroom
Second Floor
Bedroom 3
Hall
X-11
X-7
X-8
Office
X-6
Bedroom 2
X-5
X-15
X-12, X-13
X-14

Answers to Activity 3: Interpreting Laboratory Results

Instructions: The purpose of this activity is to test your ability to verify the results received from the laboratory, compare these results to EPA dust clearance standards, and interpret the results. Using the following excerpt from a lead dust clearance test results form, check the laboratory's calculation of the dust lead loading. (Note: To keep the exercise within the class time available, just the first 13 samples in the lab report are shown.)

Sample #	Location	Surface	Dimensions of Sample Area (ft^2)	Total Lead (µg)	µg/ft^2
X-1	Kitchen	Floor	1.070	10	11.8
X-2	Kitchen	Interior windowsill	0.969	323	333.3
X-3	Kitchen	Window trough	0.525	210	400.0
X-4	Hallway	Floor	1.107	9	8.1
X-5	Bedroom 2	Floor	0.988	50	50.6
X-6	Hall	Floor	1.107	6	5.4
X-7	Bedroom 3	Floor	1.094	8	7.3
X-8	Office	Floor	1.094	192	17.5
X-9	Bedroom 3	Interior windowsill	0.88	412	468.1
X-10	Bedroom 3	Window trough	0.67	111	165.7
X-11	Hall	Floor	1.107	900	813.0
X-12	Office	Interior windowsill	0.88	70	795.5
X-13	Office	Window trough	0.76	12	15.8

1. Check the results (µg lead/ft²) for each sample. If the results are incorrect, provide the correct results in µg lead/ft².

X-1: 10/1.070 = 11.8 µg/ft² is incorrect (9.3 µg/ft² is the correct result)
X-2: 323/0.969 = 333.3 µg/ft² is correct
X-3: 210/0.525 = 400.0 µg/ft² is correct
X-4: 9/1.107 = 8.1 µg/ft² is correct
X-5: 50/0.988 = 50.6 µg/ft² is correct
X-6: 6/1.107 = 5.4 µg/ft² is correct
X-7: 8/1.094 = 7.3 µg/ft² is correct
X-8 192/1.094= 17.5 µg/ft² is incorrect (175.5 µg/ft² is the correct result)
X-9: 412/0.88= 468.1µg/ft² is correct
X-10: 111/0.67= 165.7 µg/ft² is correct
X-11: 900/1.107= 813.0 µg/ft² is correct
X-12: 70/0.88= 795.5 µg/ft² is incorrect (79.5 µg/ft² is the correct result)
X-13: 12/0.76= 15.8 µg/ft² is correct

2. After verifying the laboratory's results, compare these results to the appropriate EPA recommended guidance. Did the individual samples pass or fail the lead dust clearance test?

X-1: Result 9.3 µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Pass
X-2: Result 333.3 µg/ft²	Clearance Standard: 100 µg/ft²	Pass or Fail? Fail
X-3: Result 400.0 µg/ft²	Clearance Standard: 400 µg/ft²	Pass or Fail? Fail
X-4: Result 8.1 µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Pass
X-5: Result 50.6 µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Fail
X-6: Result 5.4 µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Pass
X-7: Result 7.3 µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Pass
X-8: Result 175.5 µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Fail
X-9: Result 468.1 µg/ft²	Clearance Standard: 100 µg/ft²	Pass or Fail? Fail
X-10: Result 165.7 µg/ft²	Clearance Standard: 400 µg/ft²	Pass or Fail? Pass
X-11: Result 813.0µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Fail
X-12: Result 79.5µg/ft²	Clearance Standard: 100 µg/ft²	Pass or Fail? Pass
X-13: Result 15.8 µg/ft²	Clearance Standard: 400 µg/ft²	Pass or Fail? Pass

Answers to Activity 1: Where to Take Samples for Renovated Areas in HUD-Funded Projects

Scenario: A homeowner received Federal rehabilitation assistance (less than $5,000) to renovate specific areas of her house. After reading the description about each type of renovation performed, decide where and whether or not samples should be taken inside the house by marking an "X" on the floor plan (see floor plan on following page).

1. The kitchen cabinets were replaced. Next to the cabinets, a stove and the 18-inch-square metal wall plate that held the exhaust vent for the stove were removed. A plastic barrier was hung between the kitchen and the hallway during this project.

2. The two windows in Bedroom 2 had their sashes replaced with triple-paned, argon-gas-filled sashes. The sashes were replaced from the inside and plastic was hung on the outside of the windows. The contractor erected a barrier over the existing doorway to the bedroom. (Note that this work scope differs from the scope in the EPA example.)

3. The homeowner's company decided its employees could reduce both fuel costs and pollution by allowing them to work from home more often. As a result, the homeowner needed to create an office space. She decided to split her spacious upstairs bedroom into a smaller bedroom and an office. She had a wall constructed in the middle to divide the room. The original bedroom door was removed and two new doors were installed to allow access into each room. A window was installed in the office. The renovator considered both new rooms as a single work area and only erected a barrier between the bedroom/office and the hall.

4. The bathroom floor, original since the house was built in the 1960s, was replaced with new ceramic tile. Both the existing floor and the existing walls were ceramic tile.

HUD Answers:

Either a worksite-only clearance strategy or a whole-unit clearance strategy may be used.

Sampling Strategy A - Worksite-Only Clearance in Multiple Areas (See diagram): In this scenario, multiple work areas are created in the dwelling unit; one on the first floor and two on the second floor. This strategy clears these areas is by considering them to be individual work areas. This sampling strategy will require a minimum of 13 samples to be taken. Under HUD's Lead Safe Housing Rule, this project qualifies for worksite-only clearance because each work area was contained and the level of housing rehabilitation assistance is below $5,000.

1. Work Area #1 consists of the kitchen. You should take a floor sample from the kitchen floor near where the cabinets were hung (X-1). Because there is only one window in the work area, you should take the windowsill (X-2) and the window trough (X-3) samples from this window. The "outside the work area" sample should be taken from the hallway (X-4), since the barrier was constructed between the kitchen and the hallway. A visual inspection is not needed on the exterior because the barrier was hung on the outside of the window. A total of 4 samples are required for this work area.

Question for class discussion: If the owner had not included the removal of the stove and the wall plate, how would that have affected clearance? Answer: It would not have any effect; the cabinet replacement would still require clearance. Follow-up question: If the owner decided a month later to remove the stove and the wall plate, what would be required for clearance of that project? Answer: The plate is 18 inches on a side; with paint a few inches around it to be disturbed during removal. The paint to be removed would be a square about 2 feet on a side, or about 4 square feet. Under the HUD Lead Safe Housing Rule, this project would need to be cleared, because the paint disturbance of 4 square feet is above HUD's de minimis threshold of 2 square feet. Note that, under the EPA RRP regulation, there would be no need for clearance, because the amount of paint disturbed by removing the metal plate is within the EPA regulation's 6 square feet limit for minor repair and maintenance activities.

2. Work Area #2 is Bedroom 2. Only the sashes of the windows were replaced and the frames and sills were not affected. You should take the floor sample from the bedroom floor within 5 feet of the windows (X-5). One window sill (X-6) and one trough sample (X-7) should be taken. You may take the sill sample from one of the windows and the trough sample from the other. Because the barrier was constructed at the existing doorway, the "outside the work area" sample should be taken from the Hall near the door (X-8). An exterior visual inspection should be performed under the windows. A total of 4 samples are required for this work area plus the exterior visual inspection.

3. The work area is Bedroom 3 and the Office. Since there is more than one room, but fewer than four rooms, within the work area, both rooms must be sampled. X-9 is the floor sample in the Bedroom and X-10 is the floor sample from the Office. For window sampling, the windows in Bedroom 3 and the Office, both within this work area, are matched up. A windowsill sample (X-11) should be collected from the Bedroom window, and a window trough sample (X-12) should be collected from the Office window. On this job, the barrier was constructed between the original bedroom (now Bedroom 3 and the Office) and the Hall, so the "outside the work area" sample should be taken from the Hall (X-13). A total of 5 samples are required for this work area.

4. No samples are required because no lead-based paint was disturbed.

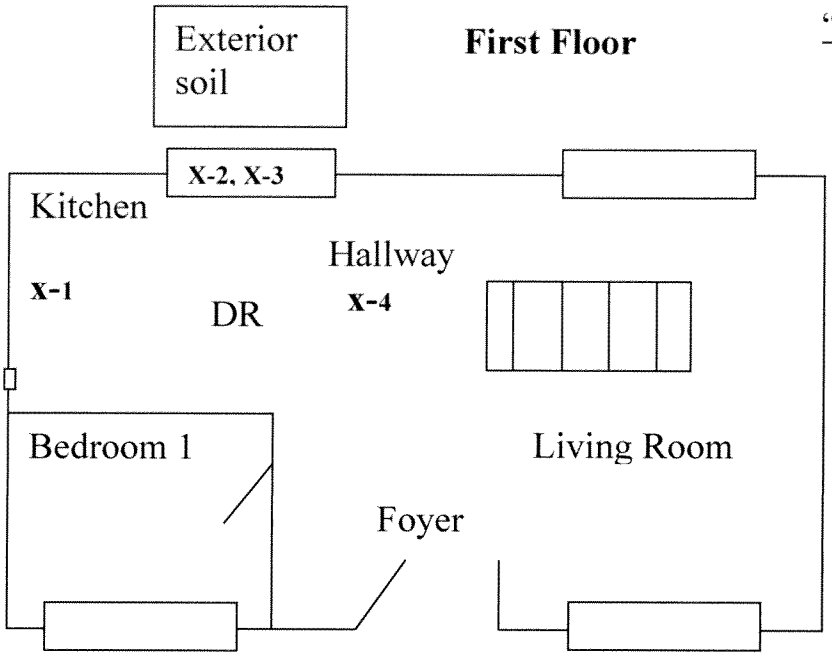
Sampling Strategy B: Whole Unit Clearance for Interior Work with No Dust Containment: In this scenario, the Lead Dust Sampling Technician elects to treat the entire unit as the work area, ignoring the containment barriers erected in the unit. There are more than four rooms in the unit, so the LDST plans to sample the following four rooms where work was done: Kitchen, Bedroom 2, Bedroom 3 and Office. Each room requires a minimum of two samples, one from the floor and one from an interior window sill or trough, alternating from sill to trough between rooms. A total of 11 samples are required for whole-unit clearance.

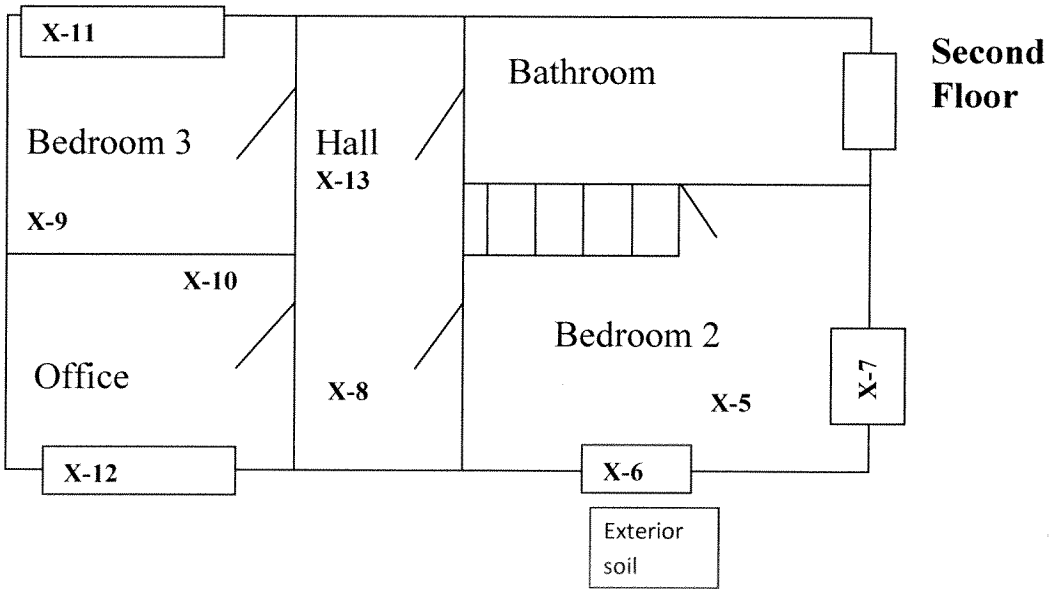
1. In the kitchen, one floor sample (X-1), one window sill (X-2) and one window trough (X-3) sample are required. A total of 3 samples in this room should be taken.
2. In Bedroom 2, one floor sample (X-5), one window sill (X-6) and one window trough (X-7) sample are required. A total of 3 samples in this room should be taken.

3. In Bedroom 3, one floor sample (X-9), and one window sill (X-11) are required. The window in this room is matched up with the window in the office. A total of 3 samples in this room should be taken.
4. In the Office, one floor sample (X-10), and one window trough sample (X-12) are required. The window in this room is matched up with the window in Bedroom 3. A total of 2 samples in this room should be taken.
5. No samples are required in the bathroom, because no lead-based paint was disturbed.

Note that an alternative strategy is to treat the whole unit as the work area, and also to consider the containment barriers erected in the unit. A total of up to 20 samples are required in this scenario. Because fewer samples are required in this unit for clearing the unit as a whole without considering the containment barriers, that approach, Strategy B, would be the choice between the whole-unit sampling strategies.

HUD Clearance
Sampling Strategy A
Worksite-Only: Mark
"X" for sample locations





Answers to Activity 3: Interpreting Laboratory Results In HUD-Funded Project

Instructions: The purpose of this activity is to test your ability to verify the results received from the laboratory, compare these results to EPA/HUD dust clearance standards, and interpret the results. Using the following excerpt from a lead dust clearance test results form, check the laboratory's calculation of the dust lead loading. (Note: To keep the exercise within the class time available, just the first 13 samples in the lab report are shown.)

Sample #	Location	Surface	Dimensions of Sample Area (ft^2)	Total Lead (µg)	µg/ft^2
X-1	Kitchen	Floor	1.070	10	11.8
X-2	Kitchen	Interior windowsill	0.969	323	333.3
X-3	Kitchen	Window trough	0.526	156	296.6
X-4	Hallway	Floor	1.107	9	8.1
X-5	Bedroom 2	Floor	0.988	50	50.6
X-6	Bedroom 2	Interior Windowsill	0.898	289	321.82
X-7	Bedroom 2	Interior trough	0.775	154	198.7
X-8	Hall	Floor	1.107	6	5.4
X-9	Bedroom 3	Floor	1.094	8	7.3
X-10	Office	Floor	1.094	192	17.5
X-11	Bedroom 3	Interior windowsill	0.88	412	468.1
X-12	Bedroom 3	Interior trough	0.67	111	165.7
X-13	Hall	Floor	1.107	900	813.0

3. Check the results (µg lead/ft²) for each sample. If the results are incorrect, provide the correct results in µg lead/ft². (Note: To keep the exercise within the class time available, just the first 13 samples in the lab report are shown.)

X-1: 10/1.070 = 11.8 µg/ft² is incorrect (9.3 µg/ft² is the correct result)
X-2: 323/0.969 = 333.3 µg/ft² is correct
X-3: 156/0.526 = 296.6 µg/ft² is correct
X-4: 9/1.107 = 8.1 µg/ft² is correct
X-5: 50/0.988 = 50.6 µg/ft² is correct
X-6: 289/.898 = 321.82 µg/ft² is correct
X-7: 154/885 = 198.7µg/ft² is correct
X-8: 6/1.107 = 5.4 µg/ft² is correct
X-9: 8/1.094 = 7.3 µg/ft² is correct
X-10: 192/1.094= 17.5 µg/ft² is incorrect (175.5 µg/ft² is the correct result)
X-11: 412/0.88 = 468.1 µg/ft² is correct
X-12: 111/0.67 = 165.7 µg/ft² is correct
X-13: 900/1.107= 813.0 µg/ft² is correct

4. After verifying the laboratory's results, compare these results to the appropriate EPA recommended guidance. Did the individual samples pass or fail the lead dust clearance test? (Note: To keep the exercise within the class time available, just the first 13 samples in the lab report are shown.)

X-1: Result 9.3 µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Pass
X-2: Result 333.3 µg/ft²	Clearance Standard: 100 µg/ft²	Pass or Fail? Fail
X-3: Result 296.6 µg/ft²	Clearance Standard: 100 µg/ft²	Pass or Fail? Fail
X-4: Result 8.1 µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Pass
X-5: Result 50.6 µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Fail
X-6: Result 333.3 µg/ft²	Clearance Standard: 100 µg/ft²	Pass or Fail? Fail
X-7: Result 296.6 µg/ft²	Clearance Standard: 100 µg/ft²	Pass or Fail? Fail
X-8: Result 5.4 µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Pass
X-9: Result 7.3 µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Pass
X-10: Result 175.5 µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Fail
X-11: Result 468.1 µg/ft²	Clearance Standard: 100 µg/ft²	Pass or Fail? Fail
X-12: Result 165.7 µg/ft²	Clearance Standard: 400 µg/ft²	Pass or Fail? Pass
X-13: Result 813.0µg/ft²	Clearance Standard: 10 µg/ft²	Pass or Fail? Fail

Attachment 6-C

Activity 4 — Translating Results into a Written Report

Instructions: The purpose of this activity is to test your ability to translate the results from the previous activity (**Interpreting Laboratory Results In HUD-Funded Project**) into a written report which is easy for the client to understand. Using the results from the previous activity and the report format from Chapter 5 (**Writing the Report**), complete a lead dust clearance test report.

LEAD DUST CLEARANCE TEST REPORT
General Information

Date of Lead Dust Clearance Test:	8/5/09
Lead Dust Sampling Technician:	Jane White
Property Address:	80 East Main St. Hammond, IN 89898
Client Name and Address:	Smith Family 80 East Main St. Hammond, IN 89898
Laboratory Name and Address:	Analysis Services, Inc. 990 45th St., Suite 500 Gary, IN 44444
Telephone Number:	222-222-2222
NLLAP Number:	IN 999999

Summary of Lead Dust Clearance Test Results

This unit failed the lead dust clearance testing portion of the lead dust sampling examination. Areas represented by the failed samples should be re-cleaned.

Lead dust above HUD/EPA clearance standards was found in the following areas:

Location	Surface	µg lead/ft^2
Kitchen	Interior windowsill	333.3
Kitchen	Window trough	296.6
Bedroom 2	Floor	50.6
Bedroom 2	Interior Windowsill	321.82
Bedroom 2	Interior trough	198.7
Office	Floor	175.5
Bedroom 3	Interior windowsill	468.1
Hall	Floor	813.0

Signature: _____*Jane White*_____ **Date:** *8/12/09*

Summary of Hazard Reduction Activities

Name of Firm	ABC Renovations
Address of Firm	123 Main Street East Chicago, IN 12345
Supervisor Name	John Brown #1634
Supervisor Certification Number	1634
Start and Completion Date of Hazard Reduction or Completion Activity	8/4/09 to 8/5/09

Description of Hazard Reduction Activities and Areas Addressed:

Location	Activity
Kitchen	Replaced A-1 window with new, vinyl-clad window
Bedroom 2	Replaced C-1 and C-2 windows with new, vinyl-clad windows

Description of work	The supervisor was present on the job site when work was being performed. Workers used lead-safe work practices. Plastic sheeting covered a 5-foot area on the ground outside under the windows being replaced and on the floor inside. Signs were posted at the doors to the bedroom and kitchen. Occupants were not allowed in the kitchen and bedroom and the outside work area during this activity. The window frame was misted prior to tear-out. After removal, workers wrapped the old windows in plastic sheeting and picked up debris on the plastic immediately and bagged it. The plastic sheeting was carefully gathered up and bagged for disposal. Workers replaced their disposable booties when leaving the work area for lunch and breaks. Respirators were not necessary. The new windows were installed and a clearance examination was requested.

Part I. VISUAL INSPECTION RESULTS FORM

Date of Lead Dust Sampling:	*8/5/09*
Lead Dust Sampling Technician:	*Jane White*
Client:	*Smith Family*
Property Address:	*80 East Main St.* *Hammond, IN 89898*

Visual Inspection of the Work Area

Work Area	Deteriorated Paint	Debris	Visible Dust	Notes	Pass/Fail
Small bedroom					*Pass*
Kitchen					*Pass*
First floor hallway					*Pass*
Staircase					*Pass*
Second floor hallway					*Pass*
Exterior soil under kitchen window					*Pass*
Exterior soil under bedroom window					*Pass*

Chapter 6

Putting the Skills Together

Lead Dust Sampling Technician
October 2011

6-2

Objectives

- Practice the skills taught in the class:
  - Choosing appropriate sampling locations
  - Taking lead dust samples
  - Interpreting Results
  - Translating Result into a Report

Lead Dust Sampling Technician
October 2011

This chapter will outline the steps a lead dust sampling technician must take from start to finish when conducting an examination. This chapter includes five activities to help practice implementing the protocols.

By the end of this chapter, students will be able to demonstrate that they can:

- Choose appropriate sampling locations
- Take lead dust samples
- Interpret Results
- Translating Results into a Report

Activity 1: Where To Take Samples

- You are now going to practice sampling area strategies.
- Your instructor will provide you with a hypothetical renovation scenario and diagram.
- Read the scenario and mark the location(s) of where you think dust wipe samples should be taken.

Remember…

- Be strategic about laying out sampling area to capture areas were the highest dust generating tasks occurred during the job.

- Refer to the *Field Guide* or Chapter 3 to determine the appropriate places to take your samples.

Activity 2: Dust Wipe Sampling

- You are now going to practice taking dust wipe samples again.
- Each individual must demonstrate proficiency.
- Follow your instructor's directions for taking samples.

Lead Dust Sampling Technician
October 2011

Activity 2: Now that the sampling locations have been determined, you will take samples on a variety of surfaces – windowsills, troughs, and floors.

Activity 3: Interpreting the Results

- Analyze the results
  - Your instructor will provide you with laboratory results to interpret.
  - Use EPA lead dust clearance standards for guidance:
    - Floors: < 10 µg/ft^2
    - Interior window sills: < 100 µg/ft^2
    - Window troughs: < 400 µg/ft^2

EPA Lead Dust Sampling Technician
October 2011

Results
When analyzing the data, follow the guidelines provided in **Chapter 4.**
Use the EPA/HUD lead dust clearance standards when evaluating sample results.

Activity 4: Translating Results into a Written Report

6-7

- Translate analyzed results into a written report
  - Using the result from the previous activity (**Interpreting the Results**), write up a report that can be easily understood by the client
  - Use the format introduced in Chapter 5 (**Writing the Report**) as a guide.

Lead Dust Sampling Technician
October 2011

Report Writing
Use the information in Chapter 5 (**Writing the Report**) as a guideline to translate the results into an easy to understand report.

Attachment 6-A
Activity 1: Where to Take Samples for Renovated Areas

A homeowner renovated her house and she chose, under the EPA RRP regulation, to have clearance conducted in her home, instead of cleaning verification. This language was inserted in the contract at the beginning of the project. After reading the description about each type of renovation performed, decide where and whether or not samples should be taken inside the house by marking an "X" on the floor plan (see floor plan on following page).

1. The kitchen cabinets were replaced. Next to the cabinets, a stove and the 18-inch-square metal wall plate that held the exhaust vent for the stove were removed. A plastic barrier was hung between the kitchen and the hallway during this project.
2. In an effort to have a more energy-efficient house, both windows in bedroom 2 were replaced with triple-paned, argon-gas windows. The contractor erected a barrier at the existing doorway to the bedroom.
3. The homeowner's company decided its employees could reduce both fuel costs and pollution by allowing them to work from home more often. As a result, the homeowner needed to create an office space. She decided to split her spacious upstairs bedroom into a smaller bedroom and an office. She had a wall constructed in the middle to divide the room. The original bedroom door was removed and two new doors were installed to allow access into each room. A window was installed in the office. The renovator considered both new rooms as a single work area and only erected a barrier between the bedroom/office and the hall.
4. The bathroom floor, original since the house was built in the 1960s, was replaced with new ceramic tile. Both the existing floor and the existing walls were ceramic tile.

Activity 1: Where to Take Samples for Renovated Areas in HUD-Funded Projects

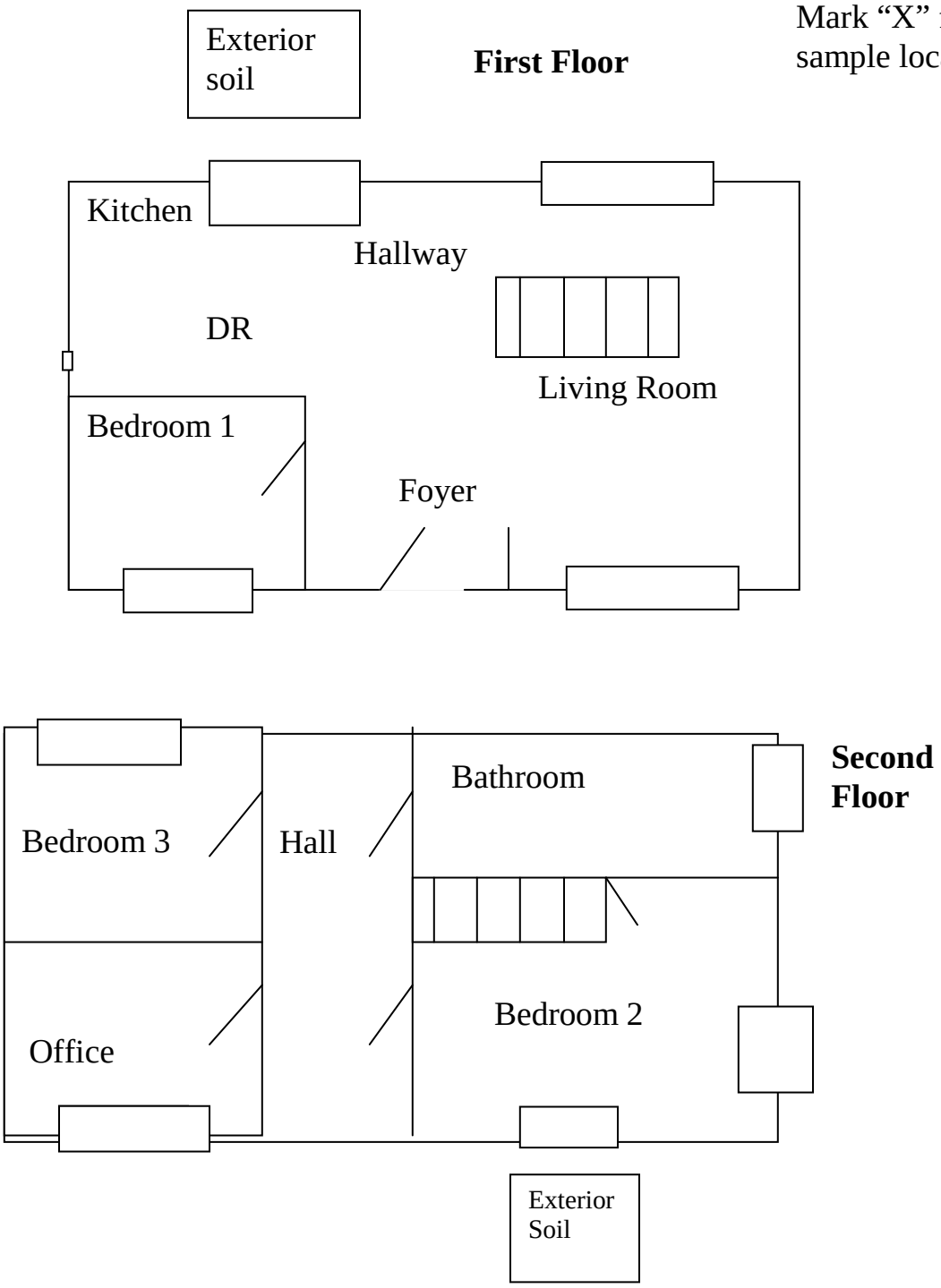
Scenario: A homeowner received Federal rehabilitation assistance (less than $5,000) to renovate specific areas of her house. After reading the description about each type of renovation performed, decide where and whether or not samples should be taken inside the house by marking an "X" on the floor plan (see floor plan on following page).

1. The kitchen cabinets were replaced. Next to the cabinets, a stove and the 18-inch-square metal wall plate that held the exhaust vent for the stove were removed. A plastic barrier was hung between the kitchen and the hallway during this project.

2. The two windows in Bedroom 2 had their sashes replaced with triple-paned, argon-gas-filled sashes. The sashes were replaced from the inside and plastic was hung on the outside of the windows. The contractor erected a barrier over the existing doorway to the bedroom. (Note that this work scope differs from the scope in the EPA example.)

3. The homeowner's company decided its employees could reduce both fuel costs and pollution by allowing them to work from home more often. As a result, the homeowner needed to create an office space. She decided to split her spacious upstairs bedroom into a smaller bedroom and an office. She had a wall constructed in the middle to divide the room. The original bedroom door was removed and two new doors were installed to allow access into each room. A window was installed in the office. The renovator considered both new rooms as a single work area and only erected a barrier between the bedroom/office and the hall.

4. The bathroom floor, original since the house was built in the 1960s, was replaced with new ceramic tile. Both the existing floor and the existing walls were ceramic tile.


Exterior soil
First Floor
Mark "X" for sample locations
Kitchen
Hallway
DR
Living Room
Bedroom 1
Foyer
Bedroom 3
Hall
Bathroom
Second Floor
Office
Bedroom 2
Exterior Soil

Attachment 6-B

Activity 3 — Interpreting Laboratory Results

Instructions: The purpose of this activity is to test your ability to verify the results received from the laboratory, compare these results to the EPA/HUD dust clearance standards, and interpret the results. Using the following excerpt from a lead dust clearance test results form, check the laboratory's calculation of the weighted lead dust sample.

Sample #	Location	Surface	Dimensions of Sample Area (ft^2)	Total Lead (µg)	µg/ft^2
X-1	Kitchen	Floor	1.070	10	11.8
X-2	Kitchen	Interior windowsill	0.969	323	333.3
X-3	Kitchen	Window trough	0.526	210	400
X-4	Hallway	Floor	1.107	9	8.1
X-5	Bedroom 2	Floor	0.988	50	50.6
X-6	Hall	Floor	1.107	6	5.4
X-7	Bedroom 3	Floor	1.094	8	7.3
X-8	Office	Floor	1.094	192	17.5
X-9	Bedroom 3	Interior windowsill	0.88	412	468.1
X-10	Bedroom 3	Interior trough	0.67	111	165.7
X-11	Hall	Floor	1.107	900	813.0
X-12	Office	Interior windowsill	0.88	70	795.5
X-13	Office	Interior trough	0.76	12	15.8

1. Check the results (µg lead/ft²) for each sample. If the results are incorrect, provide the correct results in µg lead/ft².

2. After verifying the laboratory's results, compare these results to the appropriate EPA lead dust clearance standard. Did the individual samples pass or fail the lead dust clearance test?

EPA/HUD Clearance Standards for Lead
Dust Floors: 10 µg/ft²
Interior windowsills: 100 µg/ft²
Window troughs: 400 µg/ft²

Sample	**Clearance Standard:**	**Pass or Fail?**
X-1: Result		
X-2: Result		
X-3: Result		
X-4: Result		
X-5: Result		
X-6: Result		
X-7: Result		
X-8: Result		
X-9: Result		
X-10: Result		
X-11: Result		
X-12: Result		
X-13: Result		

Activity 3: Interpreting Laboratory Results In HUD-Funded Project

Instructions: The purpose of this activity is to test your ability to verify the results received from the laboratory, compare these results to EPA/HUD dust clearance standards, and interpret the results. Using the following excerpt from a lead dust clearance test results form, check the laboratory's calculation of the dust lead loading. (Note: To keep the exercise within the class time available, just the first 13 samples in the lab report are shown.)

Sample #	Location	Surface	Dimensions of Sample Area (ft^2)	Total Lead (µg)	$µg/ft^2$
X-1	Kitchen	Floor	1.070	10	11.8
X-2	Kitchen	Interior windowsill	0.969	323	333.3
X-3	Kitchen	Window trough	0.525	210	400.0
X-4	Hallway	Floor	1.107	9	8.1
X-5	Bedroom 2	Floor	0.988	50	50.6
X-6	Bedroom 2	Interior Windowsill	0.898	289	321.82
X-7	Bedroom 2	Interior trough	0.775	154	198.7
X-8	Hall	Floor	1.107	6	5.4
X-9	Bedroom 3	Floor	1.094	8	7.3
X-10	Office	Floor	1.094	192	17.5
X-11	Bedroom 3	Interior windowsill	0.88	412	468.1
X-12	Bedroom 3	Interior trough	0.67	111	165.7
X-13	Hall	Floor	1.107	900	813.0

1. Check the results (µg lead/ft²) for each sample. If the results are incorrect, provide the correct results in µg lead/ft².

2. After verifying the laboratory's results, compare these results to the appropriate EPA recommended guidance. Did the individual samples pass or fail the lead dust clearance test?

EPA/HUD Clearance Standards for Lead
Dust Floors: 10 µg/ft²
Interior windowsills: 100 µg/ft²
Window troughs: 400 µg/ft²

X-1: Result:	Clearance Standard:	Pass or Fail?
X-2: Result:	Clearance Standard:	Pass or Fail?
X-3: Result:	Clearance Standard:	Pass or Fail?
X-4: Result:	Clearance Standard:	Pass or Fail?
X-5: Result:	Clearance Standard:	Pass or Fail?
X-6: Result:	Clearance Standard:	Pass or Fail?
X-7: Result:	Clearance Standard:	Pass or Fail?
X-8: Result:	Clearance Standard:	Pass or Fail?
X-9: Result:	Clearance Standard:	Pass or Fail?
X-10: Result:	Clearance Standard:	Pass or Fail?
X-11: Result:	Clearance Standard:	Pass or Fail?
X-12: Result:	Clearance Standard:	Pass or Fail?
X-13: Result:	Clearance Standard:	Pass or Fail?

Attachment 6-C

Activity 4 — Translating Results into a Written Report

Instructions: The purpose of this activity is to test your ability to translate the results from the previous activity (**Interpreting Laboratory Results In HUD-Funded Project**) into a written report which is easy for the client to understand. Using the results from the previous activity and the report format from Chapter 5 (**Writing the Report**), complete a lead dust clearance test report.

LEAD DUST CLEARANCE TEST REPORT
General Information

Date of Lead Dust Clearance Test:	
Lead Dust Sampling Technician:	
Property Address:	
Client Name and Address:	
Laboratory Name and Address:	
Telephone Number:	
NLLAP Number:	

Summary of Lead Dust Clearance Test Results

This unit failed the lead dust clearance testing portion of the lead dust sampling examination. Areas represented by the failed samples should be re-cleaned.

Lead dust above HUD/EPA clearance standards was found in the following areas:

Location	Surface	µg lead/ft^2

Signature: _____ **Date: _____**

Summary of Hazard Reduction Activities

Name of Firm	
Address of Firm	
Supervisor Name	
Supervisor Certification Number	
Start and Completion Date of Hazard Reduction or Completion Activity	

Description of Hazard Reduction Activities and Areas Addressed:

Location	Activity

Description of work	

Part I. VISUAL INSPECTION RESULTS FORM

Date of Lead Dust Sampling:	
Lead Dust Sampling Technician:	
Client:	
Property Address:	

Visual Inspection of the Work Area

Work Area	Deteriorated Paint	Debris	Visible Dust	Notes	Pass/Fail

Appendix A:

Excerpt from EPA Final Renovation, Repair, and Painting Rule

Appendix A: Excerpt from EPA Final Rule: Renovation, Repair, and Painting Rule

To see the entire rule go to http://www.epa.gov/fedrgstr/EPA-TOX/2008/April/Day-22/t8141.pdf.

ENVIRONMENTAL PROTECTION AGENCY
40 CFR Part 745 [EPA–HQ–OPPT–2005–0049; FRL–8355–7] RIN 2070–AC83
Lead; Renovation, Repair, and Painting Program
AGENCY: Environmental Protection Agency (EPA).
ACTION: Final rule.
SUMMARY: EPA is issuing a final rule under the authority of section 402(c)(3) of the Toxic Substances Control Act (TSCA) to address lead-based paint hazards created by renovation, repair, and painting activities that disturb lead-based paint in target housing and child-occupied facilities. ‘‘Target housing’’ is defined in TSCA section 401 as any housing constructed before 1978, except housing for the elderly or persons with disabilities (unless any child under age 6 resides or is expected to reside in such housing) or any 0-bedroom dwelling. Under this rule, a child-occupied facility is a building, or a portion of a building, constructed prior to 1978, visited regularly by the same child, under 6 years of age, on at least two different days within any week (Sunday through Saturday period), provided that each day’s visit lasts at least 3 hours and the combined weekly visits last at least 6 hours, and the combined annual visits last at least 60 hours. Child-occupied facilities may be located in public or commercial buildings or in target housing. This rule establishes requirements for training renovators, other renovation workers, and dust sampling technicians; for certifying renovators, dust sampling technicians, and renovation firms; for accrediting providers of renovation and dust sampling technician training; for renovation work practices; and for recordkeeping. Interested States, Territories, and Indian Tribes may apply for and receive authorization to administer and enforce all of the elements of these new renovation requirements.

§ 745.85 Work practice standards.

(c) *Optional dust clearance testing*. Cleaning verification need not be performed if the contract between the renovation firm and the person contracting for the renovation or another Federal, State, Territorial, Tribal, or local law or regulation requires:

(1) The renovation firm to perform dust clearance sampling at the conclusion of a renovation covered by this subpart.

(2) The dust clearance samples are required to be collected by a certified inspector, risk assessor or dust sampling technician.

(3) The renovation firm is required to re-clean the work area until the dust clearance sample results are below the clearance standards in §745.227(e)(8) or any applicable State, Territorial, Tribal, or local standard.

§ 745.90 Renovator certification and dust sampling technician certification.

(a) *Renovator certification and dust sampling technician certification*. (1) To become a certified renovator or certified dust sampling technician, an individual must successfully complete the appropriate course accredited by EPA under § 745.225 or by a State or Tribal program that is authorized under subpart Q of this part. The course completion certificate serves as proof of certification. EPA renovator certification allows the certified individual to perform renovations covered by this section in any State or Indian Tribal area that does not have a renovation program that is authorized under subpart Q of this part. EPA dust sampling technician certification allows the certified individual to perform dust clearance sampling under § 745.85(c) in any State or Indian Tribal area that does not have a renovation program that is authorized under subpart Q of this part.

(2) Individuals who have successfully completed an accredited abatement worker or supervisor course, or individuals who have successfully completed an EPA, HUD, or EPA/HUD model renovation training course may take an accredited refresher renovator training course in lieu of the initial renovator training course to become a certified renovator.

(3) Individuals who have successfully completed an accredited lead-based paint inspector or risk assessor course may take an accredited refresher dust sampling technician course in lieu of the initial training to become a certified dust sampling technician.

(4) To maintain renovator certification or dust sampling technician certification, an individual must complete a renovator or dust sampling technician refresher course accredited by EPA under § 745.225 or by a State or Tribal program that is authorized under subpart Q of this part within 5 years of the date the individual completed the initial course described in paragraph (a)(1) of this section. If the individual does not complete a refresher course within this time, the individual must re-take the initial course to become certified again.

(b) *Renovator responsibilities*. Certified renovators are responsible for ensuring compliance with § 745.85 at all renovations to which they are assigned. A certified renovator:

(1) Must perform all of the tasks described in § 745.85(b) and must either perform or direct workers who perform all of the tasks described in § 745.85(a).

(2) Must provide training to workers on the work practices they will be using in performing their assigned tasks.

(3) Must be physically present at the work site when the signs required by § 745.85(a)(1) are posted, while the work area containment required by § 745.85(a)(2) is being established, and while the work area cleaning required by § 745.85(a)(5) is performed.

(4) Must regularly direct work being performed by other individuals to ensure that the work practices are being followed, including maintaining the integrity of the containment barriers and ensuring that dust or debris does not spread beyond the work area.

(5) Must be available, either on-site or by telephone, at all times that renovations are being conducted.

(6) When requested by the party contracting for renovation services, must use an acceptable test kit to determine whether components to be affected by the renovation contain lead-based paint.

(7) Must have with them at the work site copies of their initial course completion certificate and their most recent refresher course completion certificate.

(8) Must prepare the records required by § 745.86(b)(7).

(c) *Dust sampling technician responsibilities*. When performing optional dust clearance sampling under § 745.85(c), a certified dust sampling technician:

(1) Must collect dust samples in accordance with § 745.227(e)(8), must send the collected samples to a laboratory recognized by EPA under TSCA section 405(b), and must compare the results to the clearance levels in accordance with § 745.227(e)(8).

(2) Must have with them at the work site copies of their initial course completion certificate and their most recent refresher course completion certificate.

Appendix B:

Renovate Right: Important Lead Hazard Information for Families, Child Care Providers, and Schools

THE LEAD-SAFE CERTIFIED GUIDE TO

RENOVATE RIGHT

Important lead hazard information for families, child care providers and schools.

EPA

LEAD-SAFE EPA CERTIFIED FIRM

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

EPA

1-800-424-LEAD (5323)
epa.gov/getleadsafe
EPA-740-K-10-001
Revised September 2011

This document may be purchased through the **U.S. Government Printing Office** online at bookstore.gpo.gov or by phone (toll-free): **1-866-512-1800**.

IT'S THE LAW!

Federal law requires contractors that disturb painted surfaces in homes, child care facilities and schools built before 1978 to be certified and follow specific work practices to prevent lead contamination. Always ask to see your contractor's certification.

Federal law requires that individuals receive certain information before renovating more than six square feet of painted surfaces in a room for interior projects or more than twenty square feet of painted surfaces for exterior projects or window replacement or demolition in housing, child care facilities and schools built before 1978.

- Homeowners and tenants: renovators must give you this pamphlet before starting work.
- Child care facilities, including preschools and kindergarten classrooms, and the families of children under six years of age that attend those facilities: renovators must provide a copy of this pamphlet to child care facilities and general renovation information to families whose children attend those facilities.

WHO SHOULD READ THIS PAMPHLET?

This pamphlet is for you if you:

- Reside in a home built before 1978.
- Own or operate a child care facility, including preschools and kindergarten classrooms, built before 1978, or
- Have a child under six years of age who attends a child care facility built before 1978.

You will learn:

- Basic facts about lead and your health.
- How to choose a contractor, if you are a property owner.
- What tenants, and parents/guardians of a child in a child care facility or school should consider.
- How to prepare for the renovation or repair job.
- What to look for during the job and after the job is done.
- Where to get more information about lead.

This pamphlet is not for:

- **Abatement projects.** Abatement is a set of activities aimed specifically at eliminating lead or lead hazards. EPA has regulations for certification and training of abatement professionals. If your goal is to eliminate lead or lead hazards, contact the National Lead Information Center at **1-800-424-LEAD (5323)** for more information.
- **"Do-it-yourself"** projects. If you plan to do renovation work yourself, this document is a good start, but you will need more information to complete the work safely. Call the National Lead Information Center at **1-800-424-LEAD (5323)** and ask for more information on how to work safely in a home with lead-based paint.
- **Contractor education.** Contractors who want information about working safely with lead should contact the National Lead Information Center at **1-800-424-LEAD (5323)** for information about courses and resources on lead-safe work practices.

RENOVATING, REPAIRING, OR PAINTING?

- Is your home, your building, or the child care facility or school your children attend being renovated, repaired, or painted?
- Was your home, your building, or the child care facility or school where your children under six years of age attend built before 1978?

If the answer to these questions is YES, there are a few important things you need to know about lead-based paint.

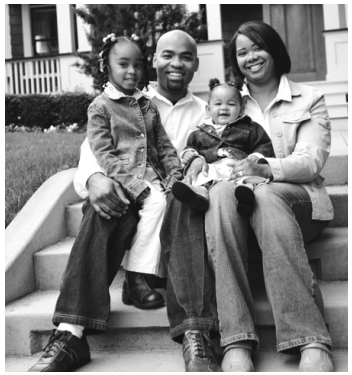
This pamphlet provides basic facts about lead and information about lead safety when work is being done in your home, your building or the child care facility or school your children attend.

The Facts About Lead

- Lead can affect children's brains and developing nervous systems, causing reduced IQ, learning disabilities, and behavioral problems. Lead is also harmful to adults.
- Lead in dust is the most common way people are exposed to lead. People can also get lead in their bodies from lead in soil or paint chips. Lead dust is often invisible.
- Lead-based paint was used in more than 38 million homes until it was banned for residential use in 1978.
- Projects that disturb painted surfaces can create dust and endanger you and your family. Don't let this happen to you. Follow the practices described in this pamphlet to protect you and your family.

LEAD AND YOUR HEALTH

Lead is especially dangerous to children under six years of age.



Lead can affect children's brains and developing nervous systems, causing:

- Reduced IQ and learning disabilities.
- Behavior problems.

Even children who appear healthy can have dangerous levels of lead in their bodies.

Lead is also harmful to adults. In adults, low levels of lead can pose many dangers, including:

- High blood pressure and hypertension.
- Pregnant women exposed to lead can transfer lead to their fetuses. Lead gets into the body when it is swallowed or inhaled.
- People, especially children, can swallow lead dust as they eat, play, and do other normal hand-to-mouth activities.
- People may also breathe in lead dust or fumes if they disturb lead-based paint. People who sand, scrape, burn, brush, blast or otherwise disturb lead-based paint risk unsafe exposure to lead.

What should I do if I am concerned about my family's exposure to lead?

- A blood test is the only way to find out if you or a family member already has lead poisoning. Call your doctor or local health department to arrange for a blood test.
- Call your local health department for advice on reducing and eliminating exposures to lead inside and outside your home, child care facility or school.
- Always use lead-safe work practices when renovation or repair will disturb painted surfaces.

For more information about the health effects of exposure to lead, visit the EPA lead website at epa.gov/lead/pubs/leadinfo or call **1-800-424-LEAD (5323)**.

There are other things you can do to protect your family every day.

- Regularly clean floors, window sills, and other surfaces.
- Wash children's hands, bottles, pacifiers, and toys often.
- Make sure children eat a healthy, nutritious diet consistent with the USDA's dietary guidelines, that helps protect children from the effects of lead.
- Wipe off shoes before entering the house.

WHERE DOES THE LEAD COME FROM?

Dust is the main problem.

The most common way to get lead in the body is from dust. Lead dust comes from deteriorating lead-based paint and lead-contaminated soil that gets tracked into your home. This dust may accumulate to unsafe levels. Then, normal hand to-mouth activities, like playing and eating (especially in young children), move that dust from surfaces like floors and window sills into the body.

Home renovation creates dust.

Common renovation activities like sanding, cutting, and demolition can create hazardous lead dust and chips.

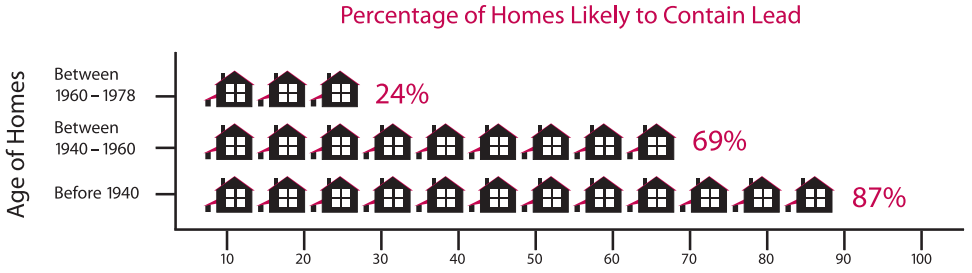
Proper work practices protect you from the dust.

The key to protecting yourself and your family during a renovation, repair or painting job is to use lead-safe work practices such as containing dust inside the work area, using dust-minimizing work methods, and conducting a careful cleanup, as described in this pamphlet.

Other sources of lead.

Remember, lead can also come from outside soil, your water, or household items (such as lead-glazed pottery and lead crystal). Contact the National Lead Information Center at **1-800-424-LEAD (5323)** for more information on these sources.

CHECKING YOUR HOME FOR LEAD-BASED PAINT



Older homes, child care facilities, and schools are more likely to contain lead-based paint.

Homes may be single-family homes or apartments. They may be private, government-assisted, or public housing. Schools are preschools and kindergarten classrooms. They may be urban, suburban, or rural.

You have the following options:

You may decide to assume your home, child care facility, or school contains lead. Especially in older homes and buildings, you may simply want to assume lead-based paint is present and follow the lead-safe work practices described in this brochure during the renovation, repair, or painting job.

You can hire a certified professional to check for lead-based paint. These professionals are certified risk assessors or inspectors, and can determine if your home has lead or lead hazards.

- A certified inspector or risk assessor can conduct an inspection telling you whether your home, or a portion of your home, has lead-based paint and where it is located. This will tell you the areas in your home where lead-safe work practices are needed.
- A certified risk assessor can conduct a risk assessment telling you if your home currently has any lead hazards from lead in paint, dust, or soil. The risk assessor can also tell you what actions to take to address any hazards.
- For help finding a certified risk assessor or inspector, call the National Lead Information Center at **1-800-424-LEAD (5323)**.

You may also have a certified renovator test the surfaces or components being disturbed for lead by using a lead test kit or by taking paint chip samples and sending them to an EPA-recognized testing laboratory. Test kits must be EPA-recognized and are available at hardware stores. They include detailed instructions for their use.

FOR PROPERTY OWNERS

You have the ultimate responsibility for the safety of your family, tenants, or children in your care.

This means properly preparing for the renovation and keeping persons out of the work area (see p. 8). It also means ensuring the contractor uses lead-safe work practices.

Federal law requires that contractors performing renovation, repair and painting projects that disturb painted surfaces in homes, child care facilities, and schools built before 1978 be certified and follow specific work practices to prevent lead contamination.

Make sure your contractor is certified, and can explain clearly the details of the job and how the contractor will minimize lead hazards during the work.

- You can verify that a contractor is certified by checking EPA's website at epa.gov/getleadsafe or by calling the National Lead Information Center at **1-800-424-LEAD (5323)**. You can also ask to see a copy of the contractor's firm certification.
- Ask if the contractor is trained to perform lead-safe work practices and to see a copy of their training certificate.
- Ask them what lead-safe methods they will use to set up and perform the job in your home, child care facility or school.
- Ask for references from at least three recent jobs involving homes built before 1978, and speak to each personally.

Always make sure the contract is clear about how the work will be set up, performed, and cleaned.

- Share the results of any previous lead tests with the contractor.
- You should specify in the contract that they follow the work practices described on pages 9 and 10 of this brochure.
- The contract should specify which parts of your home are part of the work area and specify which lead-safe work practices will be used in those areas. Remember, your contractor should confine dust and debris to the work area and should minimize spreading that dust to other areas of the home.
- The contract should also specify that the contractor will clean the work area, verify that it was cleaned adequately, and re-clean it if necessary.

If you think a worker is not doing what he is supposed to do or is doing something that is unsafe, you should:

- Direct the contractor to comply with regulatory and contract requirements.
- Call your local health or building department, or
- Call EPA's hotline **1-800-424-LEAD (5323)**.

If your property receives housing assistance from HUD (or a state or local agency that uses HUD funds), you must follow the requirements of HUD's Lead-Safe Housing Rule and the ones described in this pamphlet.

FOR TENANTS AND FAMILIES OF CHILDREN UNDER SIX YEARS OF AGE IN CHILD CARE FACILITIES AND SCHOOLS

You play an important role ensuring the ultimate safety of your family.

This means properly preparing for the renovation and staying out of the work area (see p. 8).

Federal law requires that contractors performing renovation, repair and painting projects that disturb painted surfaces in homes built before 1978 and in child care facilities and schools built before 1978, that a child under six years of age visits regularly, to be certified and follow specific work practices to prevent lead contamination.

The law requires anyone hired to renovate, repair, or do painting preparation work on a property built before 1978 to follow the steps described on pages 9 and 10 unless the area where the work will be done contains no lead-based paint.

If you think a worker is not doing what he is supposed to do or is doing something that is unsafe, you should:

- Contact your landlord.
- Call your local health or building department, or
- Call EPA's hotline **1-800-424-LEAD (5323)**.

If you are concerned about lead hazards left behind after the job is over, you can check the work yourself (see page 10).

PREPARING FOR A RENOVATION

The work areas should not be accessible to occupants while the work occurs.

The rooms or areas where work is being done may need to be blocked off or sealed with plastic sheeting to contain any dust that is generated. Therefore, the contained area may not be available to you until the work in that room or area is complete, cleaned thoroughly, and the containment has been removed. Because you may not have access to some areas during the renovation, you should plan accordingly.

You may need:

- Alternative bedroom, bathroom, and kitchen arrangements if work is occurring in those areas of your home.
- A safe place for pets because they too can be poisoned by lead and can track lead dust into other areas of the home.
- A separate pathway for the contractor from the work area to the outside in order to bring materials in and out of the home. Ideally, it should not be through the same entrance that your family uses.
- A place to store your furniture. All furniture and belongings may have to be moved from the work area while the work is being done. Items that can't be moved, such as cabinets, should be wrapped in plastic.
- To turn off forced-air heating and air conditioning systems while the work is being done. This prevents dust from spreading through vents from the work area to the rest of your home. Consider how this may affect your living arrangements.

You may even want to move out of your home temporarily while all or part of the work is being done.

Child care facilities and schools may want to consider alternative accommodations for children and access to necessary facilities.

DURING THE WORK

Federal law requires contractors that are hired to perform renovation, repair and painting projects in homes, child care facilities, and schools built before 1978 that disturb painted surfaces to be certified and follow specific work practices to prevent lead contamination.

The work practices the contractor must follow include these three simple procedures, described below:

1. **Contain the work area.** The area must be contained so that dust and debris do not escape from that area. Warning signs must be put up and plastic or other impermeable material and tape must be used as appropriate to:
   - Cover the floors and any furniture that cannot be moved.
   - Seal off doors and heating and cooling system vents.
   - For exterior renovations, cover the ground and, in some instances, erect vertical containment or equivalent extra precautions in containing the work area.

These work practices will help prevent dust or debris from getting outside the work area.

2. **Avoid renovation methods that generate large amounts of lead-contaminated dust.** Some methods generate so much lead-contaminated dust that their use is prohibited. They are:
   - Open flame burning or torching.
   - Sanding, grinding, planing, needle gunning, or blasting with power tools and equipment not equipped with a shroud and HEPA vacuum attachment.
   - Using a heat gun at temperatures greater than 1100°F.

There is no way to eliminate dust, but some renovation methods make less dust than others. Contractors may choose to use various methods to minimize dust generation, including using water to mist areas before sanding or scraping; scoring paint before separating components; and prying and pulling apart components instead of breaking them.

3. **Clean up thoroughly.** The work area should be cleaned up daily to keep it as clean as possible. When all the work is done, the area must be cleaned up using special cleaning methods before taking down any plastic that isolates the work area from the rest of the home. The special cleaning methods should include:
   - Using a HEPA vacuum to clean up dust and debris on all surfaces, followed by
   - Wet wiping and wet mopping with plenty of rinse water.

When the final cleaning is done, look around. There should be no dust, paint chips, or debris in the work area. If you see any dust, paint chips, or debris, the area must be re-cleaned.

FOR PROPERTY OWNERS: AFTER THE WORK IS DONE

When all the work is finished, you will want to know if your home, child care facility, or school where children under six attend has been cleaned up properly.

EPA Requires Cleaning Verification.

In addition to using allowable work practices and working in a lead-safe manner, EPA's RRP rule requires contractors to follow a specific cleaning protocol. The protocol requires the contractor to use disposable cleaning cloths to wipe the floor and other surfaces of the work area and compare these cloths to an EPA-provided cleaning verification card to determine if the work area was adequately cleaned. EPA research has shown that following the use of lead-safe work practices with the cleaning verification protocol will effectively reduce lead-dust hazards.

Lead-Dust Testing.

EPA believes that if you use a certified and trained renovation contractor who follows the LRRP rule by using lead-safe work practices and the cleaning protocol after the job is finished, lead-dust hazards will be effectively reduced. If, however, you are interested in having lead-dust testing done at the completion of your job, outlined below is some helpful information.

What is a lead-dust test?

- Lead-dust tests are wipe samples sent to a laboratory for analysis. You will get a report specifying the levels of lead found after your specific job.

How and when should I ask my contractor about lead-dust testing?

- Contractors are not required by EPA to conduct lead-dust testing. However, if you want testing, EPA recommends testing be conducted by a lead professional. To locate a lead professional who will perform an evaluation near you, visit EPA's website at epa.gov/lead/pubs/locate or contact the National Lead Information Center at **1-800-424-LEAD (5323).**

- If you decide that you want lead-dust testing, it is a good idea to specify in your contract, before the start of the job, that a lead-dust test is to be done for your job and who will do the testing, as well as whether re-cleaning will be required based on the results of the test.

- You may do the testing yourself. If you choose to do the testing, some EPA-recognized lead laboratories will send you a kit that allows you to collect samples and send them back to the laboratory for analysis. Contact the National Lead Information Center for lists of EPA-recognized testing laboratories.

FOR ADDITIONAL INFORMATION

You may need additional information on how to protect yourself and your children while a job is going on in your home, your building, or child care facility.

The National Lead Information Center at **1-800-424-LEAD (5323)** or epa.gov/lead/nlic can tell you how to contact your state, local, and/or tribal programs or get general information about lead poisoning prevention.

- State and tribal lead poisoning prevention or environmental protection programs can provide information about lead regulations and potential sources of financial aid for reducing lead hazards. If your state or local government has requirements more stringent than those described in this pamphlet, you must follow those requirements.

- Local building code officials can tell you the regulations that apply to the renovation work that you are planning.

- State, county, and local health departments can provide information about local programs, including assistance for lead-poisoned children and advice on ways to get your home checked for lead.

The National Lead Information Center can also provide a variety of resource materials, including the following guides to lead-safe work practices. Many of these materials are also available at epa.gov/lead/pubs/brochure

- Steps to Lead Safe Renovation, Repair and Painting.
- Protect Your Family from Lead in Your Home
- Lead in Your Home: A Parent's Reference Guide

For the hearing impaired, call the Federal Information Relay Service at 1-800-877-8339 to access any of the phone numbers in this brochure.

EPA CONTACTS

EPA Regional Offices

EPA addresses residential lead hazards through several different regulations. EPA requires training and certification for conducting abatement and renovations, education about hazards associated with renovations, disclosure about known lead paint and lead hazards in housing, and sets lead-paint hazard standards.

Your Regional EPA Office can provide further information regarding lead safety and lead protection programs at epa.gov/lead.

Region 1
(Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, Vermont)
Regional Lead Contact
U.S. EPA Region 1
Suite 1100
One Congress Street
Boston, MA 02114-2023
(888) 372-7341

Region 2
(New Jersey, New York, Puerto Rico, Virgin Islands)
Regional Lead Contact
U.S. EPA Region 2
2890 Woodbridge Avenue
Building 205, Mail Stop 225
Edison, NJ 08837-3679
(732) 321-6671

Region 3
(Delaware, Maryland, Pennsylvania, Virginia, Washington, DC, West Virginia)
Regional Lead Contact
U.S. EPA Region 3
1650 Arch Street
Philadelphia, PA 19103-2029
(215) 814-5000

Region 4
(Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee)
Regional Lead Contact
U.S. EPA Region 4
61 Forsyth Street, SW
Atlanta, GA 30303-8960
(404) 562-9900

Region 5
(Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin)
Regional Lead Contact
U.S. EPA Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3507
(312) 886-6003

Region 6
(Arkansas, Louisiana, New Mexico, Oklahoma, Texas)
Regional Lead Contact
U.S. EPA Region 6
1445 Ross Avenue,
12th Floor
Dallas, TX 75202-2733
(214) 665-7577

Region 7
(Iowa, Kansas, Missouri, Nebraska)
Regional Lead Contact
U.S. EPA Region 7
901 N. 5th Street
Kansas City, KS 66101
(913) 551-7003

Region 8
(Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming)
Regional Lead Contact
U.S. EPA Region 8
1595 Wynkoop Street
Denver, CO 80202
(303) 312-6312

Region 9
(Arizona, California, Hawaii, Nevada)
Regional Lead Contact
U.S. Region 9
75 Hawthorne Street
San Francisco, CA 94105
(415) 947-8021

Region 10
(Alaska, Idaho, Oregon, Washington)
Regional Lead Contact
U.S. EPA Region 10
1200 Sixth Avenue
Seattle, WA 98101-1128
(206) 553-1200

OTHER FEDERAL AGENCIES

CPSC

The Consumer Product Safety Commission (CPSC) protects the public from the unreasonable risk of injury or death from 15,000 types of consumer products under the agency's jurisdiction. CPSC warns the public and private sectors to reduce exposure to lead and increase consumer awareness. Contact CPSC for further information regarding regulations and consumer product safety.

CPSC
4330 East West Highway
Bethesda, MD 20814
Hotline 1-(800) 638-2772
cpsc.gov

CDC Childhood Lead Poisoning Prevention Branch

The Centers for Disease Control and Prevention (CDC) assists state and local childhood lead poisoning prevention programs to provide a scientific basis for policy decisions, and to ensure that health issues are addressed in decisions about housing and the environment. Contact CDC Childhood Lead Poisoning Prevention Program for additional materials and links on the topic of lead.

CDC Childhood Lead Poisoning Prevention Branch
4770 Buford Highway, MS F-40
Atlanta, GA 30341
(770) 488-3300
cdc.gov/nceh/lead

HUD Office of Healthy Homes and Lead Hazard Control

The Department of Housing and Urban Development (HUD) provides funds to state and local governments to develop cost-effective ways to reduce lead-based paint hazards in America's privately-owned low-income housing. In addition, the office enforces the rule on disclosure of known lead paint and lead hazards in housing, and HUD's lead safety regulations in HUD-assisted housing, provides public outreach and technical assistance, and conducts technical studies to help protect children and their families from health and safety hazards in the home. Contact the HUD Office of Healthy Homes and Lead Hazard Control for information on lead regulations, outreach efforts, and lead hazard control research and outreach grant programs.

U.S. Department of Housing and Urban Development
Office of Healthy Homes and Lead Hazard Control
451 Seventh Street, SW, Room 8236
Washington, DC 20410-3000
HUD's Lead Regulations Hotline
(202) 402-7698
hud.gov/offices/lead/

SAMPLE PRE-RENOVATION FORM

This sample form may be used by renovation firms to document compliance with the Federal pre-renovation education and renovation, repair, and painting regulations.

Occupant Confirmation

Pamphlet Receipt

❑ I have received a copy of the lead hazard information pamphlet informing me of the potential risk of the lead hazard exposure from renovation activity to be performed in my dwelling unit. I received this pamphlet before the work began.

Printed Name of Owner-occupant

Signature of Owner-occupant | Signature Date

Renovator's Self Certification Option (for tenant-occupied dwellings only)

Instructions to Renovator: If the lead hazard information pamphlet was delivered but a tenant signature was not obtainable, you may check the appropriate box below.

❑ **Declined** – I certify that I have made a good faith effort to deliver the lead hazard information pamphlet to the rental dwelling unit listed below at the date and time indicated and that the occupant declined to sign the confirmation of receipt. I further certify that I have left a copy of the pamphlet at the unit with the occupant.

❑ **Unavailable for signature** – I certify that I have made a good faith effort to deliver the lead hazard information pamphlet to the rental dwelling unit listed below and that the occupant was unavailable to sign the confirmation of receipt. I further certify that I have left a copy of the pamphlet at the unit by sliding it under the door or by (fill in how pamphlet was left).

Printed Name of Person Certifying Delivery | Attempted Delivery Date

Signature of Person Certifying Lead Pamphlet Delivery

Unit Address

Note Regarding Mailing Option — As an alternative to delivery in person, you may mail the lead hazard information pamphlet to the owner and/or tenant. Pamphlet must be mailed at least seven days before renovation. Mailing must be documented by a certificate of mailing from the post office.

Appendix C:

Lead Dust Sampling Technician Field Guide

What Is the Field Guide?

This guide will help determine that a recently-renovated area has been cleaned sufficiently. The Lead Dust Sampling Technician Field Guide should be used by lead dust sampling technicians. The guide provides protocols for conducting post-renovation clearance under EPA's Renovation, Repair, and Painting Rule (RRP) covering housing and child-occupied facilities built before 1978, and clearance examinations under HUD's Lead Safe Housing Rule (LSHR) in federally-assisted housing built before 1978. This guide also provides federal standards for maximum allowable contamination levels of residual lead dust.

How To Use This Guide

Take this guide with you on site when you perform clearance, including visual inspections. It serves as a quick reminder of:

- When and where to take lead dust clearance samples;
- The step-by-step instructions for taking a dust wipe sample; and
- EPA/HUD clearance standards for lead dust.

When To Perform Lead Dust Clearance Tests

Renovation activities that disturb lead-based paint can create lead dust so proper cleanup after these jobs is critical. The purpose of lead dust clearance is to determine if the area is safe for re-occupancy.

Lead dust clearance is performed:

- After renovation, repair, painting, and cleaning activities are finished in property built before 1978 and where children are assumed to spend time.
- After hazard reduction or maintenance activities in most federally-assisted properties built before 1978 that are covered by HUD's LSHR.

Lead dust sampling technicians should NEVER perform post-abatement clearance. (Abatement—as opposed to renovation, repair and painting—is a term used for the complete removal of lead.) When performing clearance, the lead dust sampling technician is required to bring a copy of his or her certificate of initial training to the worksite.

Where To Collect Samples for Lead Dust Clearance Tests

If there is more than one room, hallway, or stairwell within the work area, take:

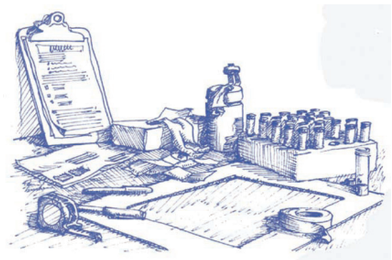
- One windowsill sample and one floor sample within each room, hall way, or stairwell (no more than four rooms, hallways, or stairwells need be sampled).
- If the windows were not closed and covered with plastic during the renovation, also take one window trough sample in each room, hall way, or stairwell (no more than four need be sampled).
- One floor sample adjacent to the work area, but not in an area that has been cleaned.

For federally-assisted housing, take these samples if the work area is contained, otherwise, clear the whole unit.

If the work area is a single room, hallway, or stairwell, or a smaller area, take:

- One windowsill sample and one floor sample.
- If the windows were not closed and covered with plastic during the renovation, also take one window trough sample.
- One floor sample adjacent to the work area, but not in an area that has been cleaned.

Equipment List



- Disposable lead dust wipes (individually wrapped)
- Disposable gloves
- Disposable shoe covers
- Sample tubes with caps
- Re-usable templates
- Masking or painter's tape
- Ruler
- Sample collection forms
- Chain-of-custody forms
- Markers, trash bags, labels, pens, re-sealable storage bags
- Calculator
- Sanitary wipes

Check with your laboratory for their sampling requirements

Visual Inspections

Lead dust clearance testing for both EPA's RRP Rule and HUD's LSHR requires a visual inspection as a first step in the clearance process:

- Under both HUD and EPA rules, the visual inspection is designed to determine if the area is free of visible dust and debris before lead dust clearance testing can begin.

In addition, under HUD's rule the visual inspection determines whether the unit/work area (interior and exterior) is clear of visible conditions that can result in exposure to lead-based paint hazards:

- Deteriorated paint
- Chips or debris
- Visible dust

Lead Dust Wipe Sampling

Single or composite samples can be taken; however, single-surface sampling is recommended to get results for specific surfaces. Use durable, re-usable 12" x 12" sampling templates, a disposable template, or use tape to lay out the sampling area.

Step One: Put on disposable shoe covers and lay out the sample area

- Clean template with a new wipe.
- Tape template to surface.
- If no template, outline with tape.
- Using tape to lay out the sample area, make sure that on floors the tape is laid in a square. On sills and troughs, the tape should be laid perpendicular to the sill.
- DO NOT touch the area inside the template.

Note: Use disposable shoe covers when walking between buildings and remove shoe covers before entering your vehicle to help minimize the spreading of settled lead dust from one location to another.

Step Two: Prepare the sample tubes

- Use clean tubes.
- Label tube with ID number.
- Record ID number on sample collection form and chain-of-custody form.
- Partially unscrew tube cap.
- Place tube near sample area.

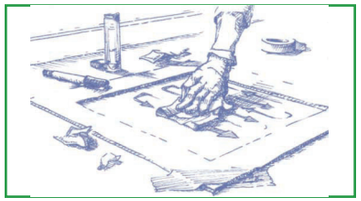
Step Three: Put on clean gloves

- Use disposable gloves.
- Use new gloves for each sample.
- DO NOT touch anything except the wipe after putting on the gloves.

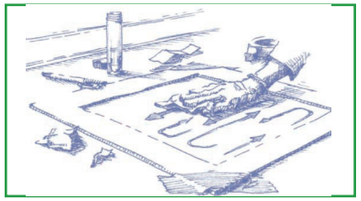
Step Four: Wipe sample area and place wipe in sample tube

- Do not touch other objects.
- Press the wipe down firmly at an upper corner of the sample area.
- Make as many "S"-like motions as needed to wipe the entire sample area, moving from side to side. Do not cross the outer border of the tape or template.
- Fold the wipe in half, keeping the dirty side in, and repeat the wiping procedure in the original direction in a forward and back motion.
- Fold the wipe again and repeat the wiping procedure, concetrating on collecting dust from the edges and corners of the sample area.

Floors



Start at corner and wipe sideways.



Now wipe in a forward and back motion.

Step Four: (Continued)

- Fold the wipe again with the sample side folded in, and place the folded wipe into the sample tube.
- Cap the container. Discard the gloves into a trash bag.
- Label the centrifuge tube and record the dimensions of the sampling area.

Step Five: Measure the sample area

- Measure width and length (unless template was used).
  - Length of sill or trough between edges of tape
  - Width of sill or trough, measure at tape
- Measure to 1/8 inch.
- Do not remove tape until after measurements are taken.

Step Six: Record sample area dimensions on forms

- Calculate the sample area and record on sample collection form and laboratory chain-of-custody form.

Step Seven: Clean up

- Clean template with a clean wipe; place in a plastic bag for storage.
- Remove materials from site:
  - Gloves, tape from floors and windows, and used shoe covers
  - Put items in trash bag, NOT in client's trash containers
- Clean face and hands with warm, soapy water.
  - Use sanitary wipes if you do not have access to warm, soapy water
- Send the samples to a laboratory recognized by the National Lead Laboratory Accreditation Program (NLLAP) as being proficient in lead in dust analysis. For information on locating EPA-accredited labs, visit http://www.epa.gov/lead/pubs/nllaplist.pdf.

Evaluate the Results

- Compare the laboratory results to the EPA clearance standards for residual lead dust provided below:
  - Floors: 10 micrograms per square foot ($\mu g/ft^2$)
  - Interior windowsills: 100 $\mu g/ft^2$
  - Window troughs: 400 $\mu g/ft^2$

These standards are for single-surface samples. The clearance standards for composite samples will be different depending on how many sub-samples are collected. Before collecting composite samples, check with your laboratory. Note that HUD discourages composite sampling when clearing federally-assisted housing.

Write the Report

- Use the standard report format.
- Sign the report.

Useful Resources

National Lead Information Center
1-800-424-LEAD (1-800-424-5323)
http://www.epa.gov/lead/pubs/nlic.htm

For a wide range of lead information—from outreach brochures to technical reports—on lead-based paint in the home.

National Lead Laboratory Accreditation Program
http://www.epa.gov/lead/pubs/nllaplist.pdf

For information on locating EPA-accredited labs.

Office of Pollution Prevention and Toxics
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (7404T)
Washington, DC 20460
202-566-0500
http://www.epa.gov/lead

For information on EPA lead-based paint regulations.

Office of Healthy Homes and Lead Hazard Control
U.S. Department of Housing and Urban Development (HUD)
451 Seventh Street, SW
Washington, DC 20410
202-755-1785
http://www.hud.gov/offices/lead

For information on the HUD lead-based paint regulations and technical assistance in complying with the HUD regulations for HUD-funded work.

United States Environmental Protection Agency
Office of Pollution Prevention and Toxics
EPA-W-04-022
March 2021

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