

## **APPENDIX B**

### **TABLES AND FORMS**

This appendix contains tables and example forms to be used in completing lead hazard risk assessments. The forms are adapted from those presented in the HUD guidelines, and may be further modified to meet installation-specific or project-specific requirements. The tables and forms include:

Table B-1	Number of Units to be Tested in Multifamily Developments
Table B-2	Main Hazard Control Options That Could Be Identified in Risk Assessments
Table B-3	Analytical Data Acceptance Criteria for Lead-Based Paint Hazard Control Activities
Figure B-1	Building/Housing Unit Condition Form
Figure B-2	Paint Condition on Selected Surfaces Data Form
Figure B-3	Deteriorated Paint Chip Sampling Form
Figure B-4	Risk Assessment Dust Wipe Sampling Form
Figure B-5	Risk Assessment Soil Sampling Form
Figure B-6	Summary of Lead-Hazard Risk Assessment Results
Figure B-7	Example Chain-of-Custody Form for Lead Risk Assessment Sampling

**Table B-1**  
**Number of Units to be Tested in Multifamily Developments**

<b>Number of Similar Units, Similar Common Areas, or exterior Site in a Building or Development</b>	<b>Pre-1960 or Unknown-age Building or Development: Number to Test</b>	<b>1960-1977 building or Development: Number to Test</b>
1-9	All	All
10-13	All	10
14	All	11
15	All	12
16-17	All	13
18	All	14
19	All	15
20	All	16
21-26	20	16
27	21	17
28	22	18
29	23	18
30	23	19
31	24	19
32	25	19
33-34	26	19
35	27	19
36	28	19
37	29	19
38-39	30	20
40-48	31	21

**Table B-1**  
**Number of Units to be Tested in Multifamily Developments**

<b>Number of Similar Units, Similar Common Areas, or exterior Site in a Building or Development</b>	<b>Pre-1960 or Unknown-age Building or Development: Number to Test</b>	<b>1960-1977 building or Development: Number to Test</b>
49-50	31	22
51	32	22

**Table B-1 (Continued)**  
**Number of Units to be Tested in Multifamily Developments**

<b>Number of Similar Units, Similar Common Areas, or exterior Site in a Building or Development</b>	<b>Pre-1960 or Unknown-age Building or Development: Number to Test</b>	<b>1960-1977 building or Development: Number to Test</b>
52-53	33	22
54	34	22
55-56	35	22
57-58	36	22
59	37	23
60-69	38	23
70-73	38	24
74-75	39	24
76-77	40	24
78-79	41	24
80-88	42	24
89-95	42	25
96-97	43	25
98-99	44	25
100-109	45	25

110-117	45	26
118-119	46	26
120-138	47	26
139-157	48	26
158-159	49	26
160-177	49	27
178-197	50	27
198-218	51	27

<b>Table B-1 (Continued)</b>		
<b>Number of Units to be Tested in Multifamily Developments</b>		
<b>Number of Similar Units, Similar Common Areas, or exterior Site in a Building or Development</b>	<b>Pre-1960 or Unknown-age Building or Development: Number to Test</b>	<b>1960-1977 building or Development: Number to Test</b>
219-258	52	27
259-279	53	27
280-299	53	28
300-379	54	28
380-499	55	28
500-776	56	28
777-939	57	28
940-1004	57	29
1005-1022	58	29
1023-1032	59	29
1033-1039	59	30
1500	87	44
2000	116	58
2500	145	73

3000	174	87
3500	203	102
4000	232	116

\*Adapted from Table 7.3 of the 1997 Revision to the HUD Guidelines.

\*\*Follow the procedures outlined in Section V of Chapter 7 of the HUD Guidelines (1997 Revision):

...multifamily housing is defined as any group of units that are similar in construction from unit to unit, with:

- 21 or more units, if any were built before 1960 or are of unknown age, or
- 10 or more units, if they were all built from 1960 through 1977.

Developments with fewer units should be treated as a series of single-family housing units.

The number of similar units, similar common areas or exterior sites to be tested (the sample size) is based on the total number units, similar common areas or exterior sites in the building(s), as specified in Table 7.3. Use the table for sampling each set of similar units, each set of similar common areas and each set of exterior sites. For pre-1960 or unknown-age buildings or development with 1,040 or more similar units, similar common areas or exterior sites, test 5.8 percent of them, and round up any fraction to the next whole number. For 1960-1977 buildings or developments with 1,000 or more units, test 2.9 percent of the units, and round up any fraction to the next whole number. For reference, the table shows entries from 1500 to 1000 in steps of 500. For example, in a development built in 1962, with 200 similar units, 20 similar common areas, and 9 similar exterior sites, sample 27 units, 16 common areas, and all 9 exterior sites.

Appendix 12 of the HUD Guidelines details the statistical rationale for this table.

**Table B-2\***  
**Main Hazard Control Options That Could Be Identified in Risk Assessments**

<b>Treatment Option</b>	<b>Dust<sup>1</sup> on Floor</b>	<b>Dust<sup>1</sup> on windows</b>	<b>Paint<sup>2</sup> on Doors</b>	<b>Paint<sup>2</sup> on Windows</b>	<b>Paint<sup>2</sup> on Floors and Walls</b>	<b>Paint<sup>2</sup> on Trim</b>	<b>High Soil Lead Levels</b>
Dust removal	X	X	X	X	X	X	X
Paint film stabilization			X	X	X	X	
Friction reduction treatments	X	X		X		X	
Impact reduction treatments	X	X	X			X	
Planting grass	X						X
Planting sod	X						X
Paving the soil	X						X
Encapsulation					X	X	
Enclosure					X	X	
Paint removal by heat gun <sup>3</sup>			X	X	X	X	
Paint removal by chemical <sup>3</sup>			X	X	X	X	
Paint removal by contained abrasive <sup>3</sup>			X	X	X	X	
Soil removal	X	X					X
Building component replacement			X	X	X	X	

\*Adapted from Table 5.8 of the 1995 HUD Guidelines.

<sup>1</sup>Lead-contaminated dust.

<sup>2</sup>Deteriorated lead-based paint.

<sup>3</sup>Limited areas only.

**Table B-3**  
**Analytical Data Acceptance Criteria for**  
**Lead-Based Paint Hazard Control Activities**

DATA ATTRIBUTE Frequency	ACCEPTANCE LIMITS			
	SINGLE WIPE	COMPOSITE WIPE	PAINT CHIP	SOIL
INDEPENDANT CALIBRATION VERIFICATION (ICV) Once per Day	Within $\pm 10\%$ of Known Value	Within $\pm 10\%$ of Known Value	Within $\pm 10\%$ of Known Value	Within 10% of Known Value
INITIAL CALIBRATION BLANK (ICB) At the Beginning of Run	Absolute Value Not More Than 10% of the Regulatory Limit or Minimum Level of Concern	Absolute Value Not More Than 10% of the Regulatory Limit or Minimum Level of Concern	Absolute Value Not More Than 10% of the Regulatory Limit or Minimum Level of Concern	Absolute Value Not More Than 10% of the Regulatory Limit or Minimum Level of Concern
CONTINUING CALIBRATION VERIFICATION (CCV) Beginning and End of Run and Every 10 Samples or as specified in the SOP	Within $\pm 15\%$ of Known Value for ICP or FAAS; Within $\pm 20\%$ for GFAA	Within $\pm 15\%$ of Known Value for ICP or FAAS; Within $\pm 20\%$ for GFAA	Within $\pm 15\%$ of Known Value for ICP or FAAS; Within $\pm 20\%$ for GFAA	Within $\pm 15\%$ of Known Value for ICP or FAAS; Within $\pm 20\%$ for GFAA
INTERFERENCE CHECK SAMPLE (ICS) Beginning and End of Run or Twice Every Eight Hours	Within 20% of Known Value			
CONTINUING CALIBRATION BLANK (CCB) After each ICS and CCV	Absolute Value not More Than 10% of Regulatory Limit of Level of Concern	Absolute Value not More Than 10% of Regulatory Limit of Level of Concern	Absolute Value not More Than 10% of Regulatory Limit of Level of Concern	Absolute Value not More Than 10% of Regulatory Limit of Level of Concern
LABORATORY CONTROL SAMPLE (LCS) One per 20 Samples or Batch-Minimum Frequency 5%	Within $\pm 20\%$ of Known Value			
MATRIX SPIKE SAMPLE (MSS) One per 20 Samples or Batch-Minimum Frequency 5%	Within 25% of Calculated Value			
DUPLICATE FIELD SAMPLE (DFS) One per 20 Samples or Batch-Minimum Frequency 5%	Within $\pm 25\%$ Relative Percent Difference (RPD)			

EP 1110-1-28  
31 Aug 01

DATA ATTRIBUTE Frequency	ACCEPTANCE LIMITS			
	SINGLE WIPE	COMPOSITE WIPE	PAINT CHIP	SOIL
MATRIX BLANK (MB) One per 20 Samples or Batch-Minimum Frequency 5%	Absolute Value Not More Than 10% of Regulatory Limit of Level of Concern	Absolute Value Not More Than 10% of Regulatory Limit of Level of Concern	Absolute Value Not More Than 10% of Regulatory Limit of Level of Concern	Absolute Value Not More Than 10% of Regulatory Limit of Level of Concern

Adapted from Table 1, EPA NLLAP Laboratory Quality System Requirements (LQSR) Revision 2.0, August 1, 1999

EP 1110-1-28

## FORM 1

31 AUG 01

### BUILDING/HOUSING UNIT CONDITION

(In multi-family housing, use a separate form for each unit.)

Installation \_\_\_\_\_ POC \_\_\_\_\_

Housing Group \_\_\_\_\_

Street Address \_\_\_\_\_ Unit No. \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

Name of risk assessor \_\_\_\_\_

Condition	Yes	No	Comments
Roof missing parts of surfaces (tiles, boards, shakes, etc.)			
Roof has holes or large cracks			
Gutters or downspouts broken			
Chimney masonry cracked, bricks loose or missing, obviously out of plumb			
Exterior or interior walls have obvious large cracks or holes, requiring more than routine pointing (if masonry) or painting			
Exterior siding has missing boards or shingles			
Water stains on interior walls or ceilings			

EP 1110-1-28  
31 Aug 01

Plaster walls or ceilings deteriorated			
Two or more windows or doors broken, missing, or boarded up			
Foundation has major cracks, missing material, structure leans, or visibly unsound			
Other (specify)			
Other (specify)			
<b>*Total Number</b>			

**Additional Comments:**

\_\_\_\_\_  
Risk Assessor Signature and Certification Number

\_\_\_\_\_  
Date

Figure B-1: Building/Housing Unit Condition Form

EP 1110-1-28

31 Aug 01

Installation \_\_\_\_\_ POC \_\_\_\_\_

Housing Group \_\_\_\_\_

Street Address \_\_\_\_\_ Unit No. \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

Name of risk assessor \_\_\_\_\_

<b>Building Component</b>	<b>Location Notes</b>	<b>Paint condition: type of deterioration.</b>	<b>Deterioration due to friction or impact?</b>	<b>Deterioration due to moisture?</b>	<b>Location of painted component with visible bite marks</b>
Building siding					
Exterior trim					
Exterior windows					
Exterior doors					
Railings					
Porch floors					
Other porch surfaces					
Interior doors					
Ceilings					
Walls					
Interior windows					
Interior floors					
Interior trim					
Stairways					
Radiator (or radiator cover)					
Kitchen cabinets					
Bathroom cabinets					
Other surfaces:					
Mini blinds					

\*Types of deterioration: surface deterioration (chalking, mildew, or friction/impact damage); bulk deterioration (checking, cracking and flaking, and alligating); layered deterioration (blistering, scaling or flaking (peeling), peeling from metal, peeling from exterior wood, peeling from plaster walls, and peeling from masonry surfaces); or a combination. If the overall condition of a component is similar throughout a dwelling, that condition should be recorded. The specific sites of the deteriorated paint should be noted. Record-specific locations of any component with bite marks.

(Table adapted from 1995 HUD Guidelines, Form 5.2)

Figure B-2: Paint Condition on Selected Surfaces Data Form

EP 1110-1-28  
31 Aug 01

**FORM 3**  
**DETERIORATED PAINT CHIP SAMPLING FORM**  
**(One form for each housing unit, common area, or exterior)**

Installation \_\_\_\_\_ POC \_\_\_\_\_

Housing Group \_\_\_\_\_

Street Address \_\_\_\_\_ Unit No. \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

Dwelling Selection Criteria: All Dwellings \_\_\_\_\_ Random \_\_\_\_\_

Sample ID#	Room Name and Number	Component	Lab Results	Units
				µg/g (ppm)

Sample *all* layers of paint, not just deteriorated paint layers.

Total number of samples on this page: \_\_\_\_\_

Date assessed: \_\_\_\_\_ Date sent to lab: \_\_\_\_\_

Shipped by: \_\_\_\_\_ (signature) Received by: \_\_\_\_\_ (signature)

Date results reported: \_\_\_\_\_ Analyzed by: \_\_\_\_\_

**(Note: Attach a Copy of the Chain-of-Custody Form to this Form. See Lab Report for QA/OC Information.)**

NOTES:

\_\_\_\_\_  
Name of Risk Assessor (print) \_\_\_\_\_

Certification Number(s) \_\_\_\_\_

Signature \_\_\_\_\_

EP 1110-1-28  
31 Aug 01

Figure B-3: Deteriorated Paint Chip Sampling Form

**FORM 4**  
**RISK ASSESSMENT DUST WIPE SAMPLING FORM**  
**(Single Surface Sampling)**

EP 1110-1-28  
 31 Aug 01

Installation \_\_\_\_\_ POC \_\_\_\_\_

Housing Group \_\_\_\_\_

Street Address \_\_\_\_\_ Unit No. \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

Dwelling Selection Criteria: All Dwellings \_\_\_\_\_ Random \_\_\_\_\_

Sample ID#	Room Name and Number	Surface Type (floor, window sill, etc.)	Is surface smooth and cleanable?	Surface Substrate	Dimensions of Sample Area (inches)	Area (ft <sup>2</sup> )	Results of Lab Analysis (µg/ft <sup>2</sup> )
					___ X ___		
					___ X ___		
					___ X ___		
					___ X ___		
					___ X ___		
					___ X ___		
					___ X ___		
					___ X ___		
					___ X ___		
					___ X ___		

Total number of samples on this page: \_\_\_\_\_

Date of sample collection: \_\_\_\_\_ Date sent to lab: \_\_\_\_\_

**(Note: Attach a Copy of the Chain-of-Custody Form to this Form. See Lab Report for QA/OC Information.)**

NOTES:

\_\_\_\_\_

Name of Risk Assessor (print) \_\_\_\_\_

Certification Number(s) \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Figure B-4: Risk Assessment Dust Wipe Sampling Form



**FORM 6**  
**SUMMARY OF**  
**LEAD-HAZARD RISK ASSESSMENT RESULTS**

EP 1110-1-28  
 31 Aug 01

Installation \_\_\_\_\_ POC \_\_\_\_\_ Phone Number: \_\_\_\_\_

Building Address or Location \_\_\_\_\_

Housing Unit No. (if applicable) \_\_\_\_\_

*Location of Identified Lead-Based Paint and/or Lead Hazards*

Room Number or Identifier	Surface Type (floor, window sill, etc.)	Sample Type (dust, paint, soil)	Sample ID#	Results of Lab Analysis	EPA Action Levels	Basis for Determination of Hazard (e.g., deteriorated paint)	Comments

Date of sample collection: \_\_\_\_\_ Total number of samples collected: \_\_\_\_\_

- KEY:** (1) **Room Number or Identifier:** must correspond with the unique Unit Number used for each unit as identified in the Risk Assessment Report.  
 (2) **Sample ID #:** Must correspond to the unique sample numbers generated during sample collection and submitted in Laboratory Report as part of the Risk Assessment Report.  
 (3) **Results of Lab Analysis:** Report Dust in  $\mu\text{g}/\text{ft}^2$ ; Paint Chips in % by weight and  $\mu\text{g}/\text{g}$  (parts per million (ppm)) and soil in ppm.  
 (4) **EPA Action Levels:** Dust: 40  $\mu\text{g}/\text{ft}^2$  for floors; and 250  $\mu\text{g}/\text{ft}^2$  for window sills; Paint chips 0.5% by weight (5000  $\mu\text{g}/\text{g}$  (ppm)); and soil: 400 ppm bare soil in play areas; 1200 ppm bare soil in non-play areas.  
 (5) **Basis for Determination of Hazard:** Dust exceeds Table A-1 action level for surface evaluated or as otherwise defined, paint chip exceeds Table A-1 definition for LBP and is deteriorated or as otherwise defined, and soil exceeds Table A-1 action levels based on child access and use.

EP 1110-1-28  
31 Aug 01

Figure B-6: Summary Form, Lead-Hazard Risk Assessment Results

EP 1110-1-28  
31 AUG 01

**FORM 7**  
EXAMPLE CHAIN OF CUSTODY FORM  
FOR LEAD RISK ASSESSMENT SAMPLING

Page \_\_\_\_\_ of \_\_\_\_\_

Project Name _____ Project Number _____ Installation _____ Project Manager _____ Company Name _____ Company Address _____ _____ Phone _____					Sample Preparation/Analysis Required (check the appropriate box)					
					ASTM E1644 (Prep)	ASTM E1645 (Prep)	ASTM E1726 (Prep)	ASTM E1979 (Prep)	ASTM E1613 (Anal)	Other (specify)
Sample ID	Sample Date	Time	Sample Matrix (wipe, paint chip, soil, other)	Laboratory ID						

EP 1110-1-28  
31 Aug 01

Sampler:	1. Released by:	2. Received by:	<u>Special Instructions/Comments:</u>
Signature	Signature	Signature	
Printed Name/Certification Number	Printed Name	Printed Name	
Company Name	Company Name	Company Name	
Date/Time	Date/Time	Date/Time	

Figure B-7: Example Chain of Custody Form for Lead Risk Assessment Sampling