U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, DC 20410-3000

OFFICE OF LEAD HAZARD CONTROL
AND HEALTHY HOMES

Policy Guidance Number: 2017-01 Rev 1	**Date**: February 16, 2017
Subject:	Revised Dust-Lead Action Levels for Risk Assessment and Clearance; Clearance of Porch Floors
Status:	Current
Applicability:	All Lead-Based Paint Hazard Control (LBPHC) and Lead Hazard Reduction (LHRD) Demonstration Grantees
Related Guidance:	
Comments:	

Summary:

The Office of Lead Hazard Control and Healthy Homes (OLHCHH) is issuing this policy guidance to establish new and more protective requirements for dust-lead action levels for its Lead-Based Paint Hazard Control (LBPHC) and Lead Hazard Reduction (LHRD) Demonstration Grantees. Use this policy guidance in conducting lead-based paint hazard risk assessments and for clearing units following interventions that disturb paint. This requirement is supported by scientific evidence on the adverse effects of lead exposure at low blood-lead levels in children as well as the evidence that lower clearance levels are routinely achieved by lead hazard control programs.

Effective April 1, 2017, all existing OLHCHH LBPHC and LHRD grantees will use the following dust-lead action levels and clearance action levels (or lower levels if required by local, state or tribal authorities having jurisdiction), where the unit µg/sf means "micrograms of lead per square foot sampled" (this unit can also be written as $\mu g/ft^2$):

New Dust-Lead Action Levels:

Floors: ≥ 10 µg/sf

Window Sills: ≥ 100 µg/sf

New Lead Clearance Action Levels:

Interior Floors: < 10 µg/sf

Porch Floors: < 40 µg/sf

Window Sills: < 100 µg/sf

Window Troughs: < 100 µg/sf

We are also adding a porch floor clearance action level because of a study that showed porches had high levels of lead dust after lead hazard control work in the home and that the action level is readily attainable.[1]

In order to ensure a smooth transition and allow for some time for issues that may arise (such as arranging laboratory conformance), this policy notice provides for a transition period of two months for the adoption of these action levels. After the transition phase in period, all grantees are expected to be in full compliance using the new action levels for risk assessments and clearance.

Note that the required use of these action levels applies only to the OLHCHH's LBPHC and LHRD grants, and does **not** constitute rulemaking under HUD's Lead Safe Housing Rule (24 CFR 35, subparts B – R), nor apply to work conducted under that rule; nor does it apply to EPA's Lead-Based Paint Hazards rule nor their Work Practice Standards for Conducting Lead-Based Paint Activities rule (40 CFR §§ 745.65 and 745.227, respectively).

Background:

The current federal dust-lead hazard and clearance standards (see below) were incorporated into regulations by the U.S. EPA and became effective on March 1, 2001.[2] Since these regulations were promulgated, additional evidence has been established supporting both the need to reduce these dust-lead standards as well as the feasibility of attaining lower lead dust loadings (the amount of lead per area) on floors, sills and troughs when clearing units following the completion of lead hazard control activities.

Current Federal Dust-Lead Standards

Lead Hazard Standards
Floors: ≥ 40 µg/sf

Window Sills: ≥ 250 µg/sf

Lead Clearance Standards
Floors: < 40 µg/sf

Window Sills: < 250 µg/sf

Window Troughs: < 400 µg/sf

[1] Wilson J, Dixon SL, Jacobs DE, Akoto J, Korfmacher KS, Breysse J. (2015) An Investigation into Porch Dust Lead Levels, *Environmental Research*, 137, 129-135, www.scribd.com/document/254001764/An-investigation-into-porch-lead-levels.

[2] EPA. Lead; Identification of Dangerous Levels of Lead. Final rule. 66 FR 1205. January 5, 2001. www.federalregister.gov/documents/2001/01/05/01-84/lead-identification-of-dangerous-levels-of-lead. See, especially, 40 CFR 745.65(b) and 745.227(h)(3).

In 2009, the U.S. EPA was petitioned to lower the dust-lead standards to 10 µg/sf for floors and 100 µg/sf for window sills.[3] In supporting this request, the petitioners cited HUD-sponsored research that examined the relationship between dust-lead surface loadings and children's blood-lead levels. The study used data (dust samples from floors and sills, and children's blood-lead) collected during the National Health and Nutrition Examination Survey (NHANES) from 1999-2004.[4,5] The study results supported the need to reduce the current clearance standards, finding that more than 95% of children would have blood-lead levels < 10 µg/dL if floors and sills had dust-lead loadings of 10 µg/sf and 100 µg/sf, respectively.

Further supporting the desirability for lower hazard and clearance standards is research demonstrating that children suffer developmental deficits even at blood lead levels below 5 µg/dL. The National Toxicology Program (NTP) published their findings on the health effects of low-level blood lead concentrations in 2012.[6] The NTP concluded that there is sufficient evidence that blood lead levels less than 10 µg/dL are associated with adverse health effects in children. This evidence prompted the Centers for Disease Control and Prevention (CDC) to replace the blood lead "level of concern" for children (10 µg/dL at the time) with a "reference value" (currently 5 µg/dL).[7] The reference value represents the 97.5th percentile of blood-lead levels in U.S. children aged 1-5 years, based on data from NHANES.

Research sponsored by the OLHCHH supports the feasibility of lead hazard control grant programs routinely achieving lower dust-lead clearance levels. A survey of HUD Lead Hazard Control Program grantees was conducted in 2014 to collect data related to the clearance levels that grantees routinely obtained in units following completion of lead hazard control activities. The survey (conducted for HUD by QuanTech, Inc.) collected data from 98 OLHCHH LBPHC and LHRD grantees.[8] The data collected represented 1,552 housing units and a total of 7,211 floor clearance sample, 4,893 windowsill clearance samples, and 2,787 window trough clearance samples. These data indicated that for final floor clearance sample results, approximately 85% were at or below 10 µg/sf, 97% of final windowsill clearance results were at or below 100 µg/sf,

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[3] www.nchh.org/Portals/0/Contents/EPA_Lead_Standards_Petition_Final.pdf.

[4] Gaitens JM, Dixon SL, Jacobs DE, Nagaraja J, Strauss W, Wilson JW, et al. Exposure of U.S. children to residential dust lead, 1999–2004: I. Housing and demographic factors. Environmental Health Perspectives 117:461–467, 2009, www.ncbi.nlm.nih.gov/pmc/articles/PMC2661918/pdf/ehp-117-461.pdf.

[5] Dixon SL, Gaitens JM, Jacobs DE et al. Exposure of U.S. children to residential dust lead, 1999-2004: II: The contribution of lead-contaminated dust to children's blood lead levels. Environmental Health Perspectives 117(3):468-474, 2009, http://ehp.niehs.nih.gov/wp-content/uploads/117/3/ehp.11918.pdf.

[6] US Department of Health and Human Services (US DHHS). Monograph: Health effects of low-level lead. 2012. US DHHS, National Toxicology Program. http://ntp.niehs.nih.gov/ntp/ohat/lead/final/monographhealtheffectslowlevellead_newissn_508.pdf.

[7] *Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention,* Report of the Advisory Committee on Childhood Lead Poisoning Prevention of the Centers for Disease Control and Prevention, January 4, 2012, www.cdc.gov/nceh/lead/acclpp/final_document_030712.pdf, also, see *CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in "Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention",* June 7, 2012, www.cdc.gov/nceh/lead/acclpp/cdc_response_lead_exposure_recs.pdf.

[8] Cox, D, Dewalt, FG, QuanTech, Inc. Lead Hazard Control Clearance Survey, Final Report. October 2015, http://portal.hud.gov/hudportal/documents/huddoc?id=ClearanceSurvey_24Oct15.pdf.

and 94% of final window trough clearance results were at or below 100 µg/sf. These results support the feasibility of grantees routinely attaining dust-lead action levels well below the current federal clearance standards, i.e., a reduction of the current clearance standards for interior floors from 40 µg/sf to an action level of 10 µg/sf, for window sills from 250 µg/sf to an action level of 100 µg/sf, and for window troughs from 400 µg/sf to an action level of 100 µg/sf. HUD does not believe that this change would be overly burdensome to grantees. As demonstrated when the clearance levels were changed previously, contractors adjust their performance behavior reasonably quickly.

Table 1. Attainable Clearance Levels by OLHCHH Grantees (QuanTech, 2015)

Surface	EPA Clearance Level (µg/sf)	Grantee Obtained Clearance Level (µg/sf)	Clearance Obtained
Floors	40	10	85 %
Window Sills	250	100	97 %
Window Troughs	400	100	94 %

In addition, OLHCHH-supported research has demonstrated that the lower lead dust levels could be maintained for an extended period following the completion of lead hazard control activities.[9] In this study, 426 dwellings that had received lead hazard control interventions by one of four HUD LBPHC grantees were sampled six years following clearance of the units. Average dust-lead loadings in these units were found to be 5 µg/sf for floors and 73 µg/sf for sills.

Reminder – all lead hazard control work, inspections and risk assessments must be performed in compliance with the "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing" (2012 Edition, *"Guidelines"*),[10] and EPA and/or state regulations (40 CFR 745, subparts L and Q, respectively).

Ensuring that Laboratories Can Achieve the New Action Level Requirements:

Laboratories that analyze samples from target housing for lead in dust samples must be recognized by EPA under its National Lead Laboratory Accreditation Program (NLLAP).[11] NLLAP's procedure for ensuring that laboratory's reports are reliable[12] includes that, when reporting a value for the lead loading of a sample, the lab must demonstrate that the minimum dust-lead loading levels it reports to a client (its Minimum Reporting Limit (MRL) for this

[9] Wilson J, Pivetz T, Ashley P, Jacobs D, Strauss W, Menkedick J, Dixon S, Tsai HS, Brown V, Friedman W, Galke W, Clark S. Evaluation of HUD-Funded Lead Hazard Control Treatments at Six Years Post-Intervention, Environmental Research 102(2):237-48, 2006.

[10] http://portal.hud.gov/hudportal/HUD?src=/program_offices/healthy_homes/lbp/hudguidelines

[11] www.epa.gov/lead/national-lead-laboratory-accreditation-program-nllap. NLLAP also covers paint samples and soil samples from target housing, and samples of all three media in child-occupied facilities, as EPA defines them (at 40 CFR 745.83).

[12] EPA National Lead Laboratory Accreditation Program Laboratory Quality System Requirements (LQSR) Revision 3.0 (November 05, 2007). www.epa.gov/sites/production/files/documents/lqsr3.pdf.

analysis) are no more than half the level of interest to the client (in this case, the Action Level), and that the minimum dust-lead loading it can detect reliably (the Minimum Detection Limit (MDL) for this analysis is no more than half of the MRL.

For example: For an Action Level of 10 µg/sf (and using a 1 sf sample area), the laboratory's MRL can be no more than 5 µg/sf and the laboratory's MDL must, therefore, be no more than 2.5 µg/sf. (Note: Terminology varies, so MRL and MDL may also be referred to as Quantitation Limit and Detection Limit, respectively, or by other terms.) As already required by NLLAP, laboratories must report results below the MRL, as less than the MRL, for example, "< 5 µg/sf," and not as "None Detected," "ND," "None Found," or similar wording.

There are two routes to achieving the new Action Level requirements:

1. A laboratory may already have the required MDL and MRL, or agree to achieve the required MDL and MRL by the effective date of this policy guidance, so a floor sampling area of 1 sf can continue to be used.
2. Inspectors, Risk Assessors and Clearance Technicians may use a sampling area of 2 sf using one dust wipe. This can be accomplished by, for example:
    a. Using a 2 sf template;
    b. Using two 1 sf square-C shaped templates taped open-face to open-face; or
    c. Measuring and marking a 2 sf area with masking tape on the outside border of the area being sampled.

Any of these approaches will satisfy the EPA requirements.[13] By analyzing a single dust wipe that was used to sample an area of 2 sf, the laboratory is really looking to be able to report on 20 µg of lead sampled from that 2 sf area. This is equivalent to reporting on 10 µg of lead per 1 sf of area and conforms to the new action level for floors.[14] The clearance survey of lead hazard control grantees (footnote 8) found (in that report's Table 6) that 91% of the grantees examined used labs with MRLs of 10 µg of lead or less in floor clearance samples. It is evident that very

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[13] Note that a sampling area larger than 2 sf, such as 4 sf, may be used, if the procedure and calculations discussed here for 2 sf are adjusted accordingly.

[14] Note that an action level based on having 20 µg of lead in a sample – 10 µg/sf over a 2 sf sampled area – requires the ability to report a result (MRL) of 10 µg or less in the sample and an ability to detect (MDL) of 5 µg or less in the sample.
Some labs show results based on the amount of lead in the sample, and some also show results based on the lead loading (the amount of lead per area):

- When the sampled area is 2 sf, the Action Level is based on 20 µg of lead in the sample, so the MRL is 10 µg per sample or less, and the MDL is 5 µg per sample or less, if the lab results are shown based on the amount of lead in the sample.
- If the lab shows results based on the lead loading, for this 2 sf sampled area, the MRL is 10 µg / 2 sf = 5 µg/sf or less, and the MDL is 5 µg/sf / 2 sf = 2.5 µg/sf or less.

If the sampled area is 1 sf, the 10 µg/sf Action Level is based on having 10 µg in the sample. Using similar calculations:

- When the sampled area is 1 sf, the Action Level is based on 10 µg of lead in the sample, so the MRL is 5 µg per sample or less, and the MDL is 2.5 µg per sample or less, if the lab results are shown based on the amount of lead in the sample.
- If the lab shows results based on the lead loading, for this 1 sf sampled area, the MRL is 5 µg / 1 sf = 5 µg/sf or less, and the MDL is 2.5 µg/sf / 1 sf = 2.5 µg/sf or less.

many labs can analyze samples for the lower floor Action Level in this guidance when 2 sf of the floor is sampled.

Porch Floor Clearance:
Wilson et. al. (footnote 1, above), in work supported by the OLHCHH, reported that lead dust loading on porch floors increased when lead hazard control work was performed in a home and no work was performed on the porch. Since lead dust on porch floors can expose children either by direct contact or through track-in to the home, and in consideration of the complex recontamination situation of porch floors, we recommend the porch floor clearance action level of <40 µg/sf be implemented after lead hazard control work in the home. Grantees should consider also clearing porch floors that are smooth and cleanable using the interior clearance action level of <10 µg/sf, particularly if there is evidence that children frequent the area.

Implementation

All LBPHC and LHRD grantees shall use the new lead dust action levels starting April 1, 2017. The timeline in Table 2 is suggested; earlier compliance by grantees is encouraged:

Month 1: Make a plan to implement the new dust-lead action levels. Inform laboratories, consultants and contractors of the upcoming changes. Discuss the results of the Lead Clearance Survey (footnote 8, above) with laboratories, consultants and contractors (and in-house lead risk assessors) that an estimated 85% of final floor clearance results were at or below 10 µg/sf, at least 97% of final windowsill clearance results were at or below 100 µg/sf, and at least 94% of final window trough clearance results were at or below 100 µg/sf.

Months 1-2: Advise and work with laboratories to establish the required MRL (half or less of the action level) and required MDL (half or less of the MRL) for floor dust lead analyses, and similarly for windowsill and window trough dust lead analyses. If a laboratory cannot or chooses not to meet the new requirement for dust wipes that have been used to sample 1 sf of floors, seek another EPA-recognized environmental lead laboratory that can and will, or specify that your risk assessors conduct floor dust sampling of 2 sf with a single dust wipe, rather than 1 sf.[15] A list of recognized laboratories is linked from EPA's NLLAP website.[16]

Month 2: Obtain agreement with any lead hazard control contractors that they will meet the new action levels. Obtain agreement with consultants that they will use the new hazard action levels and clearance action levels in their work. Obtain agreement with laboratories that they will use the new hazard action levels and clearance action levels in their analyses. (*Note that there is no window trough or porch floor standard or action level for risk assessment.)*

Month 3: Implement the new action levels for risk assessments and clearance. Housing units for which the on-site construction portion of the lead hazard control work began before the effective date of this policy guidance may use the EPA-HUD clearance standards in effect for clearing

[15] Note that only a single dust wipe is to be used for a floor sample, even if the sampling area is more than 1 sf.

[16] The NLLAP homepage is at www.epa.gov/lead/national-lead-laboratory-accreditation-program-nllap; the homepage has a link to the list of recognized by EPA under NLLAP. As of January 2017, the list was at www.epa.gov/sites/production/files/2016-09/documents/nllaplist.pdf.

those units and common areas servicing those units, although the OLHCHH encourages clearing them using the new Action Levels. Housing units for which the on-site construction portion of the lead hazard control work begins on or after the effective date of this policy guidance shall clear them using the new Action Levels.

Table 2. Implementation timeline.

Task	Month	Responsibility
1. Make a plan to implement the new dust-lead action levels.	1	Project Director/ Project Manager
2. Inform staff, sub-grantees, partners, consultants, lead-based paint inspectors and risk assessors, lead hazard control contractors, and accredited environmental lead laboratories of the new dust-lead action levels, and that the Lead Clearance Survey shows that the levels are attainable.	1	Project Manager
3. Discuss with laboratories the required MDL and MRL for floor, windowsill and window trough dust-lead analyses.	1 & 2	Project Director/ Project Manager
4. Obtain agreement with lead hazard control contractors, consultants and laboratories to meet and use the new action levels.	2	Project Manager
5. Implement new action levels for risk assessments and clearance.	3	Project Manager