Chapter 6
Environmental Assessment and Intervention

Contents

Introduction

The most effective treatment for lead poisoning is to remove the source(s) of exposure by eliminating or decreasing the lead hazards in the child's environment. Therefore, lead exposure is unlike other diseases for which medical treatments are effective; treating lead poisoning requires prompt action by public health, families, property owners, and construction trades to reduce hazards from lead-based paint (LBP) and other lead-based coatings, products, and food. Wisconsin Admin. Code. ch. DHS 163 and Wis. Stat. ch. 254 provide the framework for the activities described in this chapter.

Environmental investigation (when and what authority)

Wisconsin Stat. § 254.166 requires intervention when a child's blood lead level (BLL) meets the definition of an "elevated blood lead level (EBLL)." The statutory definition of an EBLL is a venous BLL ≥ 20 µg/dL or two venous BLLs ≥ 15 µg/dL drawn at least 90 days apart. Local health departments are *required* to do environmental investigations for children with an EBLL. Wisconsin Admin. Code. ch. DHS 163 requires the elevated blood-lead investigation to be done by a lead hazard investigator (LHI) or a lead risk assessor (RA). See Table 6.1 for the recommended time frame for follow up.

- Wisconsin law states that DHS "*shall* conduct a lead investigation of the dwelling or premises or ensure that a lead investigation of the dwelling or premises is conducted" for all children less than 6 years of age with an EBLL (Wis. Stat. § 254.166(1)).
- Local health departments (LHDs) under contract with DHS must comply with Wisconsin Statute and provide a lead hazard investigation for all children under 16 years of age with an EBLL.

Table 6.1 CDC recommended timeframe for environmental investigation according to a child's blood lead level

Blood lead level (µg/dL)	Timeframe for environmental investigation
3.5 – 14	Within 2 weeks
15 – 19	Within 2 weeks
20 – 44	Within 1 week
45 – 70	Within 48 hours
70 or Higher	Within 24 hours

LHDs *may* do environmental investigations for children with lower blood lead levels. Wisconsin Stat. § 254.166 supports action to identify and reduce lead hazards for children with lead poisoning or lead exposure. Wisconsin Stat. § 254.166(1) permits an inspection of the dwelling of any child under 6 years of age with lead poisoning or lead exposure.

Furthermore, Wis. Stat. § 254.59 states that local health officers who find human health hazards shall order the abatement or removal of the human health hazard. Wisconsin Stat.

§ 254.59(4) also specifically permits local health officers, in cities under general charter, to enter a dwelling to ascertain health conditions at any place or at any time. Wisconsin Stat. § 254.593 declares housing that is dilapidated, unsafe or unsanitary to be a human health hazard. LHDs have broad authority to address human health hazards. Wisconsin Stat. § 254.595 establishes the authority for municipal building codes and allowing municipalities to declare properties with lead hazards to be a nuisance. Cities, towns, or villages may issue orders or regulations and may commence an action to declare a property to be a human health hazard.

It is the goal of the Childhood Lead Poisoning Prevention Program (CLPPP) to encourage best practice. Therefore, CLPPP encourages LHDs to seek the resources necessary to investigate homes of children with BLLs greater than or equal to the BLRV, to identify and evaluate potential lead hazards and to encourage families and property owners to correct these conditions safely and quickly.

Environmental investigation activities

Stopping the exposure of a child to lead hazards is the most important treatment for lead poisoning. Other interventions, such as nutritional support and treatment of anemia may help to reduce lead absorption, but they won't eliminate the exposure source. Assessment of the environment is the first step in identifying the source(s) of lead exposure and activities to control or eliminate the exposure. An environmental investigation has six major components: (1) pre-investigation preparation, (2) interview, (3) visual assessment, (4) sample collection, (5) identifying and evaluating non-paint lead hazards, and (6) written report to the property owner and tenant. These are covered in detail in certification training, in administrative rules, and will be summarized in this chapter. A summary of the steps in an environmental investigation is provided on the next page.

Table 6.2 Summary steps of an environmental investigation

Environmental investigation activities	Detailed description of activities
Conduct pre-investigation activities.	Review lead-based paint hazards and data collection forms. • HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (2012 Edition) • 2012 HUD guidelines forms
Interview.	From the tenant and property owner, collect background information about the age, physical characteristics, and use patterns of the dwelling, to identify non-paint lead hazards. HUD guidelines forms
Look at the property.	Do a visual assessment to evaluate (a) the condition of painted and varnished surfaces, (b) the extent and causes of any deteriorated coatings, friction or impact surfaces or surfaces that show evidence of chewing, and (c) identify other potential lead hazards like porcelain or enamel sinks and bathtubs or bare soil. Sketch the floor plans. Take photographs to show all exterior views and any obvious hazards or deteriorated coatings.
Collect environmental samples and send to the Wisconsin State Laboratory of Hygiene for analysis.	Conduct a lead risk assessment using procedures described in Wis. Admin. Code. § DHS 163.14(9); collect dust-wipes in areas where children are likely to come into contact with dust; take at least one XRF reading from each deteriorated surface or testing combination in each room equivalent of the interior and exterior surfaces to identify lead in coatings; collect soil samples where soil is bare. In multi-family dwellings, also collect samples and X-ray fluorescence (XRF) readings from common areas. All basements, accessible attics, garages, and other outbuildings must also be assessed.
Identify non-paint hazards.	Determine if non-paint lead hazards may be causing exposure and conduct testing as needed to evaluate exposure. Consult the CLPPP to clarify how to collect unusual environmental samples and the correct laboratory to use for analysis.
Write a report and work orders for lead hazard reduction (LHR).	When lab analyses are completed, write a lead risk assessment report using the DHS template for a risk assessment report. Write work orders to correct or eliminate all lead hazards that were identified. Specify in the work orders what work needs to be done, the certification needed for those who will do the work, the due date for completing the work, and the owner's rights to appeal the order. Work ordered by LHDs to eliminate lead hazards is considered abatement, and must be performed by a state certified lead abatement contractor. Work involving temporary measures such as cleaning and stabilizing lead

Environmental investigation activities	Detailed description of activities
	hazards, may be done by a state certified lead safe renovator or a lead abatement contractor.
Deliver report and work orders to the property owner and tenant.	Provide copies to the property owner and tenant family. Wisconsin Admin. Code. ch. DHS 163 requires the risk assessment report to be delivered within 10 working days after receiving the sample results from a lab.
Submit Property Investigation Report (DPH F-44771C).	Complete this form and upload the form, the risk assessment report and orders, if orders were issued, to the property address in the environmental section of Healthy Home Lead Poisoning Surveillance System (HHLPSS).
Monitor the LHR work that is ordered.	If staff resources are available, monitor the work in progress to assure the contractors are trained and certified and that they follow correct lead-safe work practices.
Clear the property through visual assessment and clearance dust-wipe samples. Determine that non-paint hazards have been removed or addressed.	Conduct a follow-up visual assessment to determine that lead hazards have been remediated and non-paint hazards have been removed. Collect clearance dust-wipe samples to verify safe completion of the work ordered. See Table 6.6 for guidance on sample collection for clearance.
Submit Property Investigation Closure Report (F44771D).	When clearance is achieved, fill out and upload the closure and clearance report in the environmental section of HHLPSS. This form must also be completed and uploaded with the risk assessment report and form F44771C if an investigation is completed and no lead hazards were found.
Initiate Enforcement Actions.	If the property owner does not comply with LHR orders, the LHD should take action. For example, the LHD may placard the dwelling as described in Wis. Stat. § 254.166(2)(a). Other enforcement options are described in Wis. Stat. §§ 254.59 and 254.593 and 254.595. The LHD should refer enforcement cases to the County District Attorney as described in Wis. Stat. § 254.30 or to another local legal authority for enforcement.

1) **Pre-investigation preparation**
   Review the steps and forms required for completing an environmental investigation for a lead-poisoned or EBLL child. Refer to state statute and HUD guidelines for specific definitions and requirements.
   - HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (2012 Edition)
   - Wis. Admin. Code ch. DHS 163
   - Wis. Stat. ch. 254
2) **Interview the family and property owner**
   An interview with the family is vital to determine the child's habits and locations the child frequents, both in and outside of the home. Questions about possible non-LBP hazards, occupational take-home exposures, and information regarding other properties the child visits frequently should be collected at this time.

   Use HUD Form 16.1 "Resident Questionnaire for Investigation of Children with Elevated Blood Lead Levels."
3) **Visual assessment**
   A visual assessment quickly identifies deteriorated surface coatings. Whether a lead-based surface coating becomes a hazard depends on several factors:
   - The condition of the paint or coating
   - The location, such as on friction or impact surfaces
   - The concentration (parts per million) or loading (milligrams per square centimeter) as measured by XRF
   - The accessibility of the paint or coated surface to children

Bathtubs

Note that the 2012 HUD Guidelines omitted a question about deteriorated surfaces on bathtubs that was included in the earlier (1995-2011) version of the guidelines. Based on experience in Wisconsin, it is appropriate to consider bathtubs as a source of lead exposure, so DHS recommends including the question from the original version of the guidelines: "Does the child take baths in an old bathtub with deteriorated or nonexistent glazing?"

DHS also strongly recommends that RAs/LHIs evaluate potential lead dust hazards by taking dust-wipe samples from glazing on older bathtubs and sinks. Although HUD has stated that porcelain and enamel glazing does not meet HUD's interpretation of LBP coatings because of the way the lead coating was originally applied to the substrate, the lead dust that is generated when the glazing deteriorates can cause lead exposures that can harm children regardless of the application method.

In Wisconsin, RAs or LHIs from LHDs in Dane and Washington counties have documented two cases of children whose primary source of lead exposure was deteriorated lead coatings on bathtubs.

If lead is present in paint or other surface coatings that are intact (that is, in good condition and not chalking, cracking, chipping, peeling, or flaking), the lead may not present a hazard and should not be disturbed. However, if LBP is "present in accessible surfaces, friction surfaces, or impact surfaces that would result in adverse human health effects," then these coatings meet the definition of a lead-based paint hazard. See Table 6.3 for definitions and examples. Ras or LHIs should exercise judgment and consider background information such as environmental lead dust sampling data, building history, component location and occupant use patterns to determine if intact coatings on surfaces listed in Table 6.3 (on the next page) require treatment to protect occupants from lead exposure.

Table 6.3 Definition and examples of friction, impact, and accessible surfaces

Definition	Examples in the home
Friction surfaces: "... an interior or exterior surface that is subject to abrasion or friction."	• Door systems where painted parts rub against other surfaces • Window sashes and jambs • Floors or stairs, especially in high traffic areas, such as entrance areas and hallways • Cabinet drawers and their openings • Pantry or cabinet shelf surfaces where food containers or dishes may scrape the shelves
Impact surfaces: "... an interior or exterior surface that is subject to damage by repeated impacts. "	• Doors, doorknobs and latches that strike door stops, walls, or strike plates • Cabinet doors that strike cabinets or walls • Drawers that contain sharp objects (such as knives or tools) • Baseboards that may be struck by objects such as vacuum cleaners, boots, shoes, or riding toys • Stair risers and stair stringers that may be struck by the toe or tip of shoes
Accessible surfaces: "... an interior or exterior surface painted with lead-based paint that is accessible for a young child to mouth or chew."	• Windowsills • Porch railings • Stair railings and balusters • Furniture

Source: Residential LBP Hazard Reduction Act of 1992, Public Law 102-550, Section 1004, Definitions (2)

4) Collect environmental samples

Specific procedures for how to test paint or varnish by collecting samples for lab analysis or with an XRF instrument can be found in the 2012 HUD Guidelines. The condition, location, and accessibility of all potential lead hazards must be evaluated visually. Other surfaces or substances may also need to be tested to evaluate potential lead exposure sources in the child's environment.

Methods for sampling items with coatings:

- An XRF instrument can be used to test on site. The XRF measures the lead loading (lead per area) in the paint or varnish.
  The DHS Lead Safe Homes Program (LSHP) staff maintain XRF instruments that certified Ras can use to investigate dwellings where lead-exposed children reside. To make arrangements to borrow an instrument email DHSLeadSafe@dhs.wisconsin.gov. A certificate of manufacturers training

from SciAps is required prior to signing out one of the DHS XRF instruments. Details on how to obtain the manufacturers training are available from LSHP.

- Paint chip sampling is only appropriate when assessing a property with a few areas of deteriorated, impact, friction or chewed surfaces. Values are reported by concentration or lead by weight. Wisconsin LHDs can use the Wisconsin State Laboratory of Hygiene (WSLH) Occupational Health Laboratory to analyze these samples from homes of lead-exposed children. Use the fillable Wisconsin Occupations Health Laboratory Sample Submission Form.
- Home test kits indicate the presence of lead by showing a color change, but they do not quantify the amount or the concentration of lead. They can be used for educational purposes only and are not allowed to be used during a risk assessment.

Dust-wipe sampling:

Dust-wipe samples are taken to measure lead that is present in surface dust on floors and windowsills. Dust-wipe samples should be collected from floors and windowsills in all rooms where a child under the age of six has access. This includes basements and attics if there is access to those locations, even if, currently, the child doesn't typically go to those locations. Dust-wipe samples may also be used to evaluate lead dust on other non-conventional surfaces, such as toys, bathtubs and sinks, mortar and pestle, etc. If a RA or LHI is concerned about a parent's or guardian's potential to bring lead dust home from an occupational exposure to lead at work, the RA or LHI may take wipe samples from sources such as work shoes, clothing, tools, or vehicles.

Wisconsin Admin. Code § DHS 163.14 (9) states that the RA shall take dust-wipe samples from each floor and each windowsill where a child under the age of six is likely to come into contact with dust and from common areas in the building where the risk assessor determines that a child under age six is likely to come into contact with dust.

5) **Assess for non-paint lead hazards**

While painted surfaces introduce the most lead into an average child's environment, other potential sources of lead exposure should also be assessed. As RA or LHI investigate dwellings associated with increasingly lower blood lead levels, it is likely that they will identify more exposure sources (Levin et al, 2008). These include parental occupations or hobbies; pottery, traditional medicines, or cosmetics; toys; spices; cookware; or black incense. (See Chapter 3: Blood Lead Testing and Reporting for more information.) New sources of lead continue to emerge. The WSLH should not be used to analyze non-paint samples. Contact the CLPPP environmental health specialist for information on collecting and analyzing non-paint samples.

6) **Written report to property owner and tenant**

The RA or LHI must provide a written report summarizing the risk assessment to the owner and tenant of the rental property (if applicable) within 10 working days after the assessment or when results of laboratory samples are received (whichever is later). The content of the written report is described in Wis. Admin. Code § DHS

163.14 (9)(k) and template forms are found on the webpage Public Health Interventions for Lead Poisoning. The written report must include:

- The date of risk assessment.
- The address of each building assessed.
- The date of buildings construction.
- The apartment number of units assessed, if applicable.
- The name, address and telephone number for the current owner of each building.
- The name, address, telephone number, certification number and signature of each certified individual participating in the risk assessment.
- The name, address, telephone number and certification number of the certified lead company conducting the risk assessment.
- The name, address, and telephone number of each recognized laboratory conducting analysis of collected samples.
- The results of the visual inspection.
- The description of testing method and sampling procedure used for paint analysis.
- The specific locations of each painted component tested for the presence of lead.
- All data collected from on-site testing, including quality control data and, if used, the serial number of any XRF.
- All results of laboratory analysis on collected paint, soil, and dust samples.
- Any other sampling results.
- Any background information on the physical characteristics of the residential dwelling or child-occupied facility and occupant use patterns that may cause LBP exposure to a child under 6 years of age.
- If used, the results of any previous inspections or analyses for the presence of LBP hazards or other assessment of LBP-related hazards.
- A description of the location, type and severity of identified LBP hazards and any other potential lead hazards.
- A description of LHR options for each identified LBP hazard and a suggested prioritization for addressing each hazard. If the use of an encapsulant or enclosure is recommended, the report shall recommend a maintenance and monitoring schedule for the encapsulant or enclosure.

LHR work orders must specify the level of training and certification that is required for those who will do the work, and the date when the work must be completed.

To facilitate writing the report, data should be collected and recorded in a systematic fashion to keep the lead investigation organized and thorough. Careful data collection helps to document findings and communicate clearly with property owners and occupants. Several tools can be found in the 2012 HUD Guidelines or on the Public Health Interventions for Lead Poisoning webpage. Investigators can use or adapt any data collection form or tool as long as they meet the requirements of Wis. Admin. Code ch. DHS.163.

Under Wis. Stat. § 254.166(1), reports of investigations conducted in response to a child with lead poisoning shall be made available to the public and therefore should be

written to withstand public scrutiny. Additional sample results related to items not attached to the home or property (XRF test results of: toys; furniture; bulk lab results of spices; cultural or religious powders; cosmetics; etc.) should be discussed with the family or sent to the family in a separate letter explaining testing results of consumer products.

Property owners must provide these reports to future tenants and buyers under U.S. federal law governing real estate transactions. This requirement is regulated and enforced by HUD and EPA. To comply with federal law, the report to the owner should include the following paragraph:

> The federal Residential Lead-Based Paint Hazard Reduction Act, 42 U.S.C. 4852d, requires sellers and landlords of most residential housing built before 1978 to disclose all available records and reports concerning lead-based paint and/or lead-based paint (LBP) hazards, including the test results contained in this notice, to purchasers and tenants at the time of sale or lease or upon lease renewal. This disclosure must occur even if hazard reduction or abatement has been completed. Failure to disclose these test results is a violation of the U.S. Department of Housing and Urban Development and the U.S. Environmental Protection Agency regulations at 24 CFR Part 35 and 40 CFR Part 745 and can result in a fine of up to $11,000 per violation. To find out more information about your obligations under federal LBP requirements, call 1-800-424-5323.

A sample letter, written to a property owner, can be found under forms and templates on the Public Health Interventions for Lead Poisoning webpage.

LHD staff must upload into the environmental section of HHLPSS the Property Investigation Report F44771C, the risk assessment report and the lead work orders letter if hazards were identified and orders were issued. This information allows CLPPP program staff to conduct surveillance of childhood lead poisoning causes and effectively target resources to assist in education, environmental investigations and primary prevention activities.

7) **Medicaid reimbursement**
   If a lead-poisoned or lead-exposed child is enrolled in Medicaid, the Wisconsin Medicaid Program will reimburse LHDs for an environmental inspection of the child's home as well as a follow-up inspection to determine clearance of the property after work has been done. More information can be found on the Medicaid Reimbursement for Lead-Related Services webpage.

Certification and training

Wisconsin law requires anyone who conducts an environmental investigation be a certified RA or LHI Wis. Admin. Code DHS § 163.14(2).

After identifying and evaluating lead hazards in dwellings occupied by children with lead poisoning, LHDs have some discretion about what level of trained and certified contractors they require owners to use. LHDs can order owners to use either:

- Certified lead abatement contractors to permanently correct lead hazards or
- Certified lead safe renovators to temporarily and safely correct lead hazards with interim controls only.

Note: Abatement contractors can complete both permanent abatement and interim controls. At the time of this writing, there are significantly fewer abatement contractors available throughout the state. If available, it is recommended to hire abatement contractors to perform permanent control measures of lead hazards, but interim controls may be the only available option and any type of LHR work should be done as soon as possible.

Lead-safe renovators are not allowed to replace or remove identified lead hazards. If a rehabilitation program or grant requires lead abatement, a certified lead abatement company would be required to perform the work.

The Wisconsin Asbestos and Lead Section is the source for information about training, certification, and work practice requirements for LHR. The webpage includes:

- How to obtain certification for various lead disciplines.
- What certification is required for persons doing LHR or lead investigation work.
- When a refresher course is required for each discipline.
- Who is certified in Wisconsin.
- Which accredited training providers provide training opportunities.
- Links to other state and local programs with information about LHR.

The program can be reached by calling 608-261-6876 or emailing DHSAsbestosLead@wi.gov.

Lead hazard reduction activities

The RA or LHI's goals are to get the owner to fix the lead hazards quickly, permanently if possible, and protect children from lead exposure. The main roles of the RA or LHI are to:

- Write orders for abatement or interim control activities and set a timeline for work to be completed. Wis. Stat. § 254.166(2m) gives required due dates for completion of ordered work.
- Ensure all lead hazards are identified and property owners address all identified lead hazards.
- Monitor LHR work and document that hazards have been successfully treated.
- Refer property owner to agencies or programs that offer financial assistance for the LHR work.

Analysis of Wisconsin data of children with diagnostic BLLs between 20 and 40µg/dL has shown that it takes about 2.2 years for the BLL to drop below 10µg/dL. Another Wisconsin study found that it took most property owners 465 days (median value) to correct lead hazards in dwellings where children were identified with an elevated blood lead (Zierold et al., 2007). Additional analysis found a faster decline in the child's BLL when the LHR on the property was completed within six months. Based on these data, it is important to set realistic expectations for work to reduce lead hazards that can be accomplished quickly.

Work orders for lead hazard reduction

Although work orders will include LHR for all lead hazards identified on a property during the risk assessment, the LHD can help the property owner understand how to prioritize LHD work to most effectively decrease exposure to children. There is more lead on exterior surfaces than interior surfaces in US homes (Jacobs, et al, 2002). Children's blood lead levels decrease when exterior hazards are corrected. Children living in homes where exterior lead hazards have been addressed showed lower blood lead after a year than children without these exterior interventions (Clark, Galke, et al., 2011).

Areas where children play, eat, and sleep and where lead paint or varnish has been documented should be prioritized or corrected first. Priority attention should be given to high-risk areas of exposure:

- Floors, stairs and porches that have deteriorated coatings (such as visible paint chips or documented lead dust hazards)
- Windows that have visible paint chips, dust or glazing debris accumulating on the stool or in the trough or documented lead dust hazards
- Deteriorated exterior surfaces (Note that exterior painted surfaces are subject to greater weather variability, extremes of temperature and moisture)
- Exterior child play areas or bare soil contaminated with visible paint chips or documented soil lead hazards
- Toys, beds, and other furniture in the child's usual activity areas

RA or LHI can exercise considerable discretion as they describe work methods for the owner to use to address the lead hazards. Any LHR work, whether interim controls or abatement, can create exposure hazards if dust is not minimized, proper clean-up is not done, or the person doing the work is not properly trained. Depending on the hazards found and the type of work to be done, the occupants may need to be relocated until the hazards are controlled. Relocation is normally required by physicians for chelated children until the primary residence is lead safe.

Abatement measures for lead hazard reduction

According to Wis. Admin. Code § 163.03(1) abatement means "any measure or set of measures intended to permanently eliminate LBP hazards." While abatement tends to be costly, it does produce long-term safety for children and greater liability protection for the property owner. The four types of abatement techniques commonly used are encapsulation, enclosure, removal, and replacement. The definition and application of each is fully described in Table 6.4 (on the next page).

Data indicates that permanent measures are more effective at reducing lead dust levels and

protecting children than temporary measures (Wilson J, et al., Dixon SL, et al., 2007; Dixon SL, et al., 2012). However, when funding is not available, property owners often find temporary measures are less expensive and more feasible. If permanent measures are too expensive for a given situation, it is appropriate to write orders for temporary measures. Children benefit from rapid control of lead hazards. (See Table 6.5 for the differences between lead-safe renovation and lead abatement activities.)

Earlier studies can offer useful historical evidence on evaluating lead hazard control measures.
Does Residential Lead-Based Paint Abatement Work? A Review of the Scientific Evidence (National Center for Lead-Safe Housing, 1995); and
Review of the Studies Addressing Lead Abatement Effectiveness (EPA, 1998).

Table 6.4 Lead-based paint abatement techniques

Method/ definition	Description	Application
Encapsulation ". . . the process of making LBP inaccessible by the application of an encapsulant." Wis. Admin. Code § 163.03(44)	Provides a barrier between LBP and the environment.	A barrier, formed by applying a liquid coating or adhesive bond specifically labeled as an encapsulant, is used to cover LBP. The area to be treated is first tested to determine if the encapsulant will hold to the surface. Not for use on friction or impact surfaces. When complete, encapsulation should leave an easy-to-clean surface.
Enclosure ". . . the use of rigid, durable materials . . . that act as a dust-tight barrier between LBP and the environment." Wis. Admin. Code. § 163.03(44)	A barrier is attached to building components with all edges and seams sealed. Examples are sheet rock, wood or wood paneling on walls, exterior siding, aluminum cladding over exterior window and door trim, soffit and fascia, vinyl/metal sash tracks for windows, linoleum, or wood over floors.	The enclosed area must be able to support the added weight of the enclosure material. Enclosure material is nailed, screwed, caulked, or when a type of sealant is applied to the back of the surface to create a dust tight seal. When complete, enclosure should leave an easy-to-clean surface.
Removal	The removal of all LBP from building components. Can be done on- or off-site. Removal can be conducted on the entire	The following methods **cannot** be used for on-site removal: Wis. Admin. Code. §§ DHS 163.14(3) and 163.14(4): • Open flame burning or torching

Method/ definition	Description	Application
	surface or just at the friction points where LBP rubs together.	• Machine sanding or grinding, abrasive blasting or sandblasting, or planing **unless** contained and a HEPA attachment is used • Uncontained high-pressure water blasting or "hydroblasting" • Paint strippers containing methylene chloride. • A heat gun at ≥ 1100°F • Dry scraping **except** around electrical outlets or on spots totaling no more than 2 square feet in any one interior space or 20 square feet on exterior surfaces When complete, removal should leave an easy-to-clean surface.
Replacement ". . . removing building components that have surfaces coated with LBP and installing new components free of LBP. Wis. Admin. Code. § 163.03(101)	The building component contaminated with LBP is replaced with a new component.	Cost effective for wood trim (baseboards), as well as replacing doors and windows with energy efficient ones. When complete, replacement should leave an easy-to-clean surface.

Non-abatement measures for lead hazard reduction

Non-abatement activities are "any measures or activities intended to temporarily but not permanently reduce exposure to LBP hazards" Wis. Admin. Code. § DHS 163.03(1)(c). Cleaning, wet scraping, and repainting can be economical and cost-effective for some interior or exterior wall surfaces. Cleaning can rapidly reduce lead dust levels, but lead hazards addressed by cleaning only fail dust tests quicker and more often. **Cleaning alone will not address the source(s) of lead dust hazards.**

Examples of temporary measures to quickly clean and control access to hazards:

- Wash pacifiers and toys that are mouthed frequently during the day.
- Block access to areas where paint is not intact (for example, with heavy pieces of furniture).
- Wet-wipe windowsills and wells at least twice a week using wet disposable cleaning wipes.
- Wet mop all floors with wet disposable cleaning clothes at least twice a week and as needed.
- Use a vacuum with a HEPA filter to clean areas of paint dust and chips.

These temporary measures are most effective when the area is limited, such as a windowsill, well, porch, or floors. They are not a substitute for long-term or permanent LHR.

Interim controls require continuous and frequent monitoring because it is unclear how long they will effectively control lead hazards. Whenever possible, LHDs are advised to order cleaning only for immediate and very short-term efforts to reduce lead exposure. For example, LHDs can order stabilization (cleaning, preparing the surfaces for re-painting) for temporary control of lead hazards. Limited wet scraping and wet sanding may be considered interim control methods if the goal is to prepare surfaces for re-painting and stabilize surfaces coated with old lead paint rather than the permanent removal of LBP.

If orders allow the owner to conduct non-abatement work such as painting, the LHD should emphasize to the owner that the dwelling must meet clearance dust standards with dust-wipe sampling.

Table 6.5 Lead-safe renovation activities versus lead abatement

Issue	Lead-safe renovation activities	Lead abatement
Who may conduct	• Certified Lead Safe Renovator (LSR) • Certified Lead Abatement Supervisor • Certified Lead Abatement Worker • Employees trained and supervised by a certified renovator, etc. • Must be affiliated with a Certified Lead Company	• Certified Lead Abatement Supervisor • Certified Lead Abatement Worker • All must be affiliated with a certified lead company
Certification card	Must have card **on site** when at renovation site.	Must have card **on site** at all times.
Project notification	**Not** required	Required
Information to occupants and owners	Distribute the "Renovate Right" pamphlet to owners and occupants.	Prepare and post an occupant protection plan.
Work methods	Follow documented lead-safe methodologies.	Follow documented abatement methodologies.
Responsibilities of a certified person	A certified lead-safe renovator must: • Provide on the job training to untrained workers. • Be on site to ensure signs are posted and work area is contained. • Be on site during final cleaning. • Conduct the final Cleaning Verification protocol. LSR is **not** required to be on site all other times during renovation.	A certified supervisor: • Must provide **direct** on-site supervision to certified workers at all times during abatement work, from containment set-up to final cleaning. • Ensures proper containment, work practices and cleaning methods are used.
Containment	Interior: Minimum 6 feet Exterior: Minimum 10 feet Containment must prevent distribution of dust and debris outside of the **renovation** work area.	Containment of work area. Must prevent the distribution of dust and debris outside of the **abatement** area.
Protect property	Must protect personal property.	Must protect personal property.

Issue	Lead-safe renovation activities	Lead abatement
Restrict access	Restrict access to renovation areas.	Restrict access to abatement areas.
Cleaning and final cleaning	Preclean work area prior to setup of containment. Clean work area each day and at end of the project. Ensure a LSR is on site to ensure proper cleaning.	Preclean work area prior to setup of containment area. Clean work area each day and at end of the project. Ensure a certified supervisor is on site.
Visual inspection	LSR conducts visual inspection of work area (interior and exterior) to ensure all dust and debris have been removed.	Certified supervisor conducts visual inspection of work area (interior and exterior) to ensure all dust and debris have been removed.
Cleaning verification and clearance	LSR personally conducts the final Cleaning Verification protocol.	Certified supervisor arranges for post-abatement clearance to be conducted by a certified lead inspector, hazard investigator, or risk assessor.
Report	Provides written report within 10 days after completion of renovation project to the owner and person contracting.	Provides written report to person contracting for abatement within 10 days after receiving clearance report, but no later than 20 days following completion of the abatement project.

Setting a completion date for orders

Wisconsin Stat. § 254.166(2m) provides LHDs guidance in setting time limits for property owners to conduct this work (Table 6.6). State law uses two different verbs ("will" and "may") to define imminent lead hazards and lead hazards:

- An imminent lead hazard (Wis. Stat. § 254.11(7g)) **will** place a child under six years of age at risk of developing lead poisoning or lead exposure. An environmental investigation that finds lead dust above the legal limits would be an appropriate example of an imminent lead hazard, since dust is acknowledged to be the major source of childhood lead exposure.
- Lead hazards (Wis. Stat. § 254.11(8g)) **may** contribute to lead poisoning or lead exposure of a child under six years of age. An environmental investigation that finds deteriorated paint would be an example to describe a lead hazard. Deteriorated paint, if uncorrected, will typically create lead dust or lead soil hazards.

LHDs shall issue orders (to the property owner) to reduce or eliminate imminent hazards within five days. For non-imminent lead hazards, LHDs shall order owners to reduce or eliminate lead hazards within 30 days of the order's issuance. For orders issued to address non-imminent hazards on the exterior of the dwelling during the cold weather period of October 1 to May 1, orders may require a deadline of no earlier than June 1 immediately following the order's issuance. LHDs can extend the time to comply with the orders if the agency determines that the property owner has good cause for not complying.

Table 6.6 Deadlines for ordering lead hazard reduction

Type of hazard*	Time Limit
Imminent hazards Wis. Stat. § 254.11(7g)	5 days
Non-imminent hazards	30 days
Non-imminent exterior hazards found October 1 through May 1	After the next June 1

*Wis. Stat. § 254.166(2m)

Monitor certification and work in progress

Lead abatement work must be done by a certified lead abatement contractor. However, if the LHD allows the property owner to do non-abatement work to reduce lead hazards, such as re-painting, then either the owner must be certified as a lead-safe renovator or the owner must hire a certified lead-safe renovator. DHS maintains lists of currently certified lead-safe renovators and lead abatement contractors. This information is maintained by the Wisconsin Asbestos and Lead Section, 608-261-6876, and is posted on the **Lead-Safe Wisconsin** webpage.

If staff resources are sufficient and available, the LHD RA or LHI should find out the work schedule and arrange to visit the work site to ensure the workers hold the appropriate level of certification for the required work. Work orders can be written to require the owner to provide notice when the work will be started. Similarly, if possible, the LHD staff should monitor the work in progress to ensure proper dust control methods are in place and no new lead hazards are created.

Disposal of lead-contaminated materials

The Wisconsin Department of Natural Resources (DNR) regulates lead removal and disposal. In Wisconsin, "lead paint waste from residential projects is considered household waste for disposal purposes and is not subject to hazardous waste regulation. Lead paint waste from households should be collected in plastic bags, sealed and placed in the household trash, or taken to a household hazardous waste collection facility or landfill that accepts construction waste.

For more information, view the Commercial and Residential Paint Removal and Disposal pamphlet or contact the DNR Bureau of Solid and Hazardous Waste Management. To ask questions or obtain further information, contact a DNR regional office or the DNR Waste

and Materials Management Program at 608-266-2111 or DNRWasteMaterials@Wisconsin.gov.

Clear the property

Once the work on the property is completed, the certified RA or LHI must conduct a follow-up visit to complete a visual clearance and dust-wipe sample clearance. Details of the clearance protocol can be found in Wis. Admin. Code. § DHS 163.14(5).

The first step in clearing the property is to do a visual inspection. The visual inspection includes ensuring the work ordered was completed, there is no visible dust, dirt or debris present and no new lead hazards were created.

If the property passes the visual inspection, the next step is to collect dust-wipe samples from work areas based on table 6.7. Before clearance samples can be taken a minimum of one hour must pass after the certified contractor does their final cleaning.

Table 6.7 Sample collection guide for clearance investigations

Interior work with dust containment separating work areas from non-work areas	Interior work with no dust containment to separate work and non-work areas	Exterior paint disturbing work
Collect a floor and a window (sill or trough) wipe sample from at least four rooms*. If dwelling has less than four rooms, collect a floor and windowsill or trough dust-wipe in each room.	Collect a floor and a window (sill or trough) wipe sample from at least four rooms. If dwelling has less than four rooms, collect a floor and windowsill or trough dust-wipe in each room.	Conduct a visual inspection. Look for visible dust or debris on horizontal surfaces in outdoor common area close to work area such as porch, patio, deck, sidewalk, or stoop.
Collect at least one floor sample per 2000 sq. ft. of floor from a common area inside the containment.	Collect at least one floor sample in common area per 2000 sq. ft. of floor.	Look for paint chips on the dripline, next to the foundation or any other surface below any exterior work areas.
Collect at least one floor sample outside the containment but within 10 feet of the containment boundary. HUD recommends collecting a floor wipe sample from each walkway used to enter or exit the work area. If exterior work is	If exterior work is completed after interior clearance, it is recommended to collect one dust-wipe sample from inside entrances.	If new soil was applied, collect one composite soil sample per Wis. Admin. Code. § DHS 163.14(1)(g). Dust-wipe samples on porches are discretionary. If exterior work is completed after interior clearance and

Interior work with dust containment separating work areas from non-work areas	Interior work with no dust containment to separate work and non-work areas	Exterior paint disturbing work
completed after interior clearance it is recommended to collect one dust-wipe sample from inside entrances.		window troughs were not sealed, collect at least four window trough samples during exterior clearance.

* The term "room" includes hallways, stairwells and any other living areas.

Wis. Admin. Code § DHS 163.14(5) requires a minimum of four floor dust-wipe samples and four window dust-wipe samples (one each, from four different rooms) for clearance. Window dust-wipe samples must include alternating between both sills and troughs if both are present. These samples must meet clearance dust standards for the component before the property can be considered cleared and safe for re-occupancy. Current Wisconsin standards for single-surface dust sampling are provided in Table 6.8. If the results exceed these standards, LHDs must order additional cleaning and re-sample when the cleaning is done until clearance standards are met. Each clearance must have sample results from at least four rooms if four rooms are available.

Table 6.8 Wisconsin standards for single surface dust sampling

Surface	Leaded dust loading (µg/ft^2)
Floors	10
Porch floor*	40
Interior windowsills or stools	100
Window wells or troughs	100

Source: Wis. Admin. Code § DHS 163.14(5) clearance.
*See Wis. Admin. Code § DHS 163.03(91m) for definition of a porch.

If the work orders address exterior soil hazards only, dust samples may not be required. If, for example, the only corrective action is to cover bare soil with mulch or new grass, then a visual assessment is sufficient for clearance. In any case, the RA or LHI conducting the clearance must provide a written clearance report to the property owner and tenant within 10 working days of the field investigation or within 10 days of when the laboratory reports results of their analysis of the environmental samples. Required information in a clearance report is found in Wis. Admin. Code § DHS 163.14(5).

When the property is cleared, the RA or LHI must complete and upload the Property Investigation Closure Report F-44771D and the final clearance report in HHLPSS under the property address in the environmental section.

Enforcement of lead hazard reduction

The property owner is responsible for reducing identified lead hazards as ordered by the LHD. The property owner's responsibility to correct identified lead hazards remains even if the lead-poisoned child living there at the time of diagnosis moves out and is no longer in occupancy.

It is important to respond quickly to investigate the property where the child is living in case the child relocates. If the family with a lead-poisoned child moves, the RA or LHI must investigate the lead-poisoned child's new residence to ensure that the dwelling is in good condition, or to investigate if it, too, has lead hazards present. All properties where a lead-poisoned child lives or spends time must have a full lead investigation (risk assessment) regardless of the age or condition of the house. If there are no deteriorated coatings, friction, impact or chewed surfaces, or if the dwelling was built after 1978, a visual assessment is still required, and dust-wipe samples must be collected to rule out any non-paint sources or take-home occupational lead dust exposure. All areas of bare soil must also be sampled. The RA or LHI must also investigate secondary residences or other places where the child spends a significant amount of time.

For communities without a local ordinance, Wis. Stat. ch. 254 provides several tools to enforce the statute when property owners are not compliant. For example, LHDs can post notices on the property in a conspicuous place indicating that a lead hazard is present under the authority of Wis. Stat. § 254.166(2)(a). Many LHDs have used this strategy with productive results.

Local health departments, under Wis. Stat. § 254.59, may choose to pay for the correction of human health hazards (including lead) and then seek repayment for these costs from the property owner through local municipal property taxes.

In addition, under Wis. Stat. § 254.59, an owner who retains a human health hazard may be fined up to $300 or imprisoned for up to 90 days or both.

Additional enforcement authority, described in Wis. Stat. § 254.595, gives the ability to file "lis pendens" to motivate owners to comply with their local housing code. Essentially this ensures potential buyers find out that repairs are required when they do a title search.

Finally, if the property owner does not comply with orders to correct lead hazards, the LHD may report the violation of the law to the district attorney of the county in which the property is located for enforcement of the statute. Violators of the law are subject to civil and criminal penalties and fines. Many communities have sought enforcement to motivate noncompliant owners through Wis. Stat. § 254.30. Typically this is time consuming since it requires the involvement of three levels of government: the LHD, county district attorney, and the state law. LHDs report varied results when using Wis. Stat. § 254.30 to motivate owners to fix lead hazards.

Local ordinances

Since it is often so time consuming to assure that property owners correct lead hazards in housing and comply with orders in a timely manner, many communities have established

local housing ordinances. Local ordinances can help LHDs expedite the resolution of cases involving property owners who do not correct lead hazards within appropriate time limits. Historically, property owners in communities with local ordinances such as Milwaukee and Racine comply more quickly with LHR orders than owners in other Wisconsin communities. Many Wisconsin communities report that lead cases can move quickly through their municipal legal systems both because the parties may be more familiar with each other and because the parties are more familiar with childhood lead poisoning as an important issue. Others have suggested that "the act of appearing before a judge in a court of law seems to have served as an incentive for many owners." (Campbell et al., 2013)

Communities where public awareness about lead poisoning is great enough to support passage of an ordinance also tend to be better educated about lead and the threat it poses to children's health. These communities respond more promptly to lead poisoning, partly because owners are educated about the need to correct hazards and partly because judges are educated about the issues and act quickly to enforce the local ordinances.

Information on lead hazard reduction

For a full discussion of how to conduct interim controls and lead abatement, the following are excellent resources:

- *HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, 2012 Edition*, especially chapters 11-16.
- *Lead Paint Safety: A Field Guide for Painting, Home Maintenance, and Renovation Work*, U.S. Department of Housing and Urban Development, Office of Lead Hazard Control, June 1999. Note that this booklet was published before EPA issued the Lead Safe Renovator Rule, so the text is out of date from a regulatory perspective.

For the most current information on federal law and regulations regarding LHR, visit:

- HUD
- EPA's National Lead Information Center
- National Center for Healthy Housing

For current information on Wisconsin statute relating to childhood lead poisoning and LHR activity, see Chapter 1: Consolidated Contracts, Standards, and Definitions of this handbook or the Wisconsin Statutes and Administrative Rules for Lead Poisoning Prevention webpage.

Funding for lead hazard reduction

Funding for LHR activities remains the primary responsibility of the property owner. This is a major challenge in eliminating the sources of childhood lead poisoning.

LHDs are encouraged to communicate and collaborate with local funding sources (such as banks, savings and loans, credit unions) and housing agencies (such as weatherization

agencies or Community Development Block Grant agencies) to assist with building the capacity for lead-safe renovation work, financing, and the improvement of quality, affordable, lead-safe housing throughout their community.

The CLPPP will attempt to keep LHDs updated on HUD grants and other housing rehabilitation grant or loan programs, like the Lead-Safe Homes Program.

The Wisconsin Department of Administration, Division of Housing, Bureau of Affordable Housing maintains lists of agencies that offer loans and grants for housing rehabilitation and LHR, and posts links to these resources. The Division of Housing distributes the CDBG Housing and HOME program funds that HUD allocates to Wisconsin among all Wisconsin communities except those which get their own funding directly from HUD. For purposes of distributing CDBG funds, the Division of Housing divides the state into seven regions with a principal county contact in each region.

The Division of Housing has two other funding and resource booklets. Household Housing Guide includes a list of funding sources for low- and moderate-income owner-occupied dwellings. The Rental Housing Guide includes a list of funding sources for low- and moderate-income rental properties.

Summary

- The main lead hazard for children is deteriorated lead-based paint (LBP). To protect children, it is necessary to evaluate and control their exposures to lead dust, lead soil and deteriorated lead paint hazards.
- Wis. Stat. § 254.166(1) states that "if the department is notified that an occupant of a dwelling or premises who is a child under 6 years of age has an elevated blood lead level (EBLL), the department ***shall*** conduct a lead investigation of the dwelling or premises . . ."
- LHDs that contract with DHS to provide childhood lead poisoning prevention services are required to conduct investigations for all children with EBLLs. An EBLL is defined as one venous blood lead level (BLL) ≥20µg/dL or two venous BLLs ≥15 µg/dL drawn at least 90 days apart. An "EBL investigation" is described in Wis. Admin. Code. § DHS 163.03(39). After conducting the investigation, LHDs must upload a completed Property Investigation Report F44771C, risk assessment report and orders, if any were issued in the property address in the environmental section of HHLPSS.
- While there is no requirement for LHDs to investigate homes of children with blood lead levels less than an EBLL, LHDs ***may*** do so. LHDs can cite the Wis. Stat. § 254.166(1) as their authority to conduct environmental investigations for dwellings occupied by children who have blood lead poisoning or lead exposure. See Wis. Stat. § 254.11(9) for the current BLL supported by statute. Wisconsin Stat. § 254.156 states that DHS will change the definition of lead poisoning or lead exposure when CDC revises the blood lead reference value (BLRV). Since it will likely take time for

DHS to revise Wis. Stat. § 254.11(9) when the BLRV is revised, a LHD can choose to do investigations at BLLs below the level in statute. The LHD would not have the support of state law at that time and must have local regulations or ordinances to support any orders issued below what is recognized by DHS as "lead-poisoned". LHDs may also cite other laws such as Wis. Stat. §§ 254.59 or 254.593 as their authority to conduct environmental investigations to evaluate lead hazards in other dwellings (such as where children have BLLs between 3.5 and 5 µg/dl).

- Under Wis. Stat. § 254.166 (2m), if the RA or LHI finds lead hazards in the home, the LHD **shall** issue an order describing the work needed to address the lead hazards, including a date when the work must be finished. If no lead hazards are found, the RA or LHI should conduct a lead investigation, in places other than the home, where the child spends a significant amount of time.
- It is in the best interest of the child if the work to decrease lead hazards is accomplished quickly and is as long lasting as possible, given the resources available.
- When the property owner reports that lead hazard reduction work is completed, the RA or LHI should conduct clearance including (a) visually clearing the dwelling to assure that the work to correct the hazards was done and (b) collecting dust-wipe samples to assure that the dwelling is safe. Detailed work practice procedures for conducting clearance are described in Wis. Admin. Code. § DHS 163.14(5). Once the property meets both visual and dust-wipe clearance standards, the RA or LHI must upload to HHLPSS a completed Property Investigation Closure Report F44771D and the final clearance report in the property address in the environmental section.
- If clearance standards are not met, the RA or LHI shall inform the property owner and order further actions to correct the problems and set a deadline for completion.
- If the property owner delays in completing orders within the time described in the orders, then the LHD should take more action. This may include posting a notice on the dwelling that lead hazards are present on the property; legal authority for this is in Wis. Stat. § 254.166(2)(a). Other enforcement options are described in Wis. Stat. § 254.59 and 254.593 and 254.595. The LHD may also refer the case to the local legal counsel if there are relevant building codes, laws, or municipal ordinances. The LHD may also refer the case to the county district attorney as described in Wis. Stat. § 254.30. (See Appendix B for a sample notice to the district attorney.) If the LHD declares the dwelling untenantable due to lead hazards, then Wisconsin landlord tenant law Wis. Stat. § 704.07 may apply.