LEAD INSPECTION & RISK ASSESSMENT

When must a Comprehensive Lead Inspection be done?

- In response to an EIBLL
  - >20 µg/dL (confirmed)
  - two 15-19 µg/dL tests taken >90 days apart
- When a child resides in a dwelling that requires abatement, 19a-111-2(d)
- Other dwellings- applies to multi-unit EIBLL properties where children < 6 reside (EIBLL 1st flr, children <6 on 2nd flr)
- Prior to issuance of DPH Day Care License for Centers/Group Day Care Homes (or prior to relicensure)

Inspection Priorities

1) **Environmental Intervention Blood Lead Level**
   - Done in response to an BLL of ≥20 µg/dL or two 15-19 µg/dL tests taken >90 days apart
   - Initiated within **5 working days** after notification

Inspection Priorities

2) **Other dwellings:**

Inspections shall begin within 30 working days and be completed expeditiously as in possible in all dwelling units in which a child resides in the same building as those identified in 19a-111-3(c) (1).

Inspection Priorities 19a-111-3(c)(1-3)

3) **Child Day Care Services:**

* Before licensure or relicensure of a child day care center or group day care home by the CT DPH
* Can be performed by licensed lead consultant, but should be reviewed by local health

Lead Inspection

Must be conducted by:

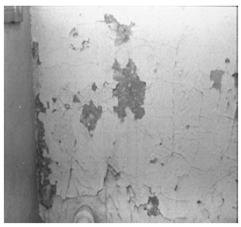
* Trained code enforcement official (CEO)
* Licensed Lead Consultant that employs certified lead inspector/ risk assessor

Interior Lead Inspection

- Conduct walk through of interior
- Sketch layout of dwelling, label rooms using A, B, C, D orientation
- Proceed room to room in systematic, orderly fashion

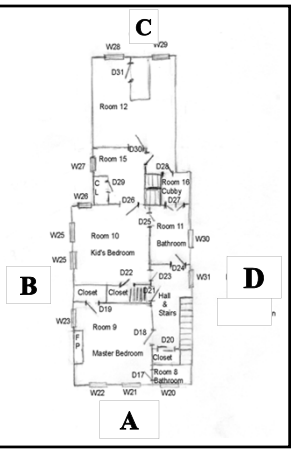
Visual Assessment

- Note condition of paint & substrate
- Document cause of damage
- Note any housing issues that may require correction before abatement (leaks, holes)



Sketch The Dwelling

- Note locations of doors, windows, closets, stairs
- Show orientation of sides of rooms and structure (A, B, C, D)
- Number and title rooms/areas



Conduct Paint Testing

XRF Analysis

- toxic level is 1.0 mg/sq.cm or greater

Paint Chip Analysis

- toxic level is .5% or greater lead by weight
- sample defective paint (all layers)
- 1 square inch

Preparing for the Inspection:

XRF Analyzers

- Instrument exposes a painted surface to radiation emitted from a sealed source
- The source is cobalt-57 (^{57}Co)
- ^{57}Co emits energy in the form of gamma rays
- The elements in the paint are "excited" and respond by emitting energy in the form of x-rays, this response in known as *fluorescence*

XRF Analyzers

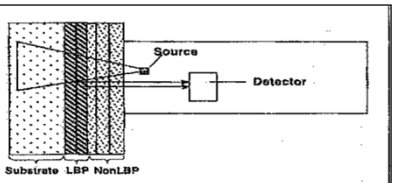


Figure 5-1. XRF emitting gamma and X rays and analyzing characteristic X rays from paint and substrate

Radiation Safety

- Gamma rays are forms of *ionizing radiation*
- If the XRF is not used properly it can be harmful to users and those in the direct path of the analyzer's emissions
- You must be trained in Radiation Safety by the manufacturer prior to use (web based training)
- With proper use the inspector will be exposed to very small amounts of radiation

Radiation Safety

- Always handle an XRF with care
- Minimize exposure by distance & shielding
- The Gamma rays will travel approximately one foot <u>beyond</u> a measured surface
- Do not allow anyone to stand on either side of instrument while in operation (radiation emits sideways too)
- Wear a dosimeter badge to measure radiation exposure over time

Radiation Safety

STORAGE:

- Store in a locked and labeled cabinet to prevent unauthorized use or accidental exposure to radiation
- The following documents ***must*** be stored with the XRF:
  - DEEP Registration
  - DEEP Certificate of Use
  - Most recent wipe test results
  - Radiation Monitoring Log Sheet (records Geiger readings & hours used)
  - Performance Characteristic Sheet dated 12/1/06

DPH XRF LPA-1 Loaner Program

* Currently 4 XRF instruments at DPH available for loan
* 9 XRF units on long-term loan in the following LHDs:

Fairfield HD	Meriden HD
Stamford HD	Hartford HD
Bridgeport HD (2)	WHBHD
QVHD	NVHD

These instruments may also be available for short term loan

Preparing for the Inspection: **XRF Analyzers**

Prior to using the XRF-

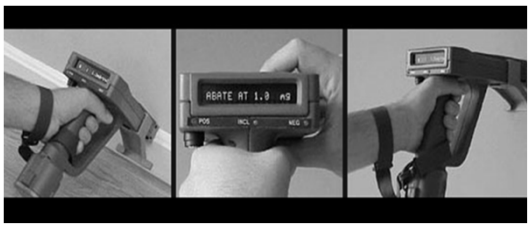
* Review the LPA-1 User's Guide
* Check battery-charge overnight if needed
* Geiger counter-take readings before and after use
* Record Geiger counter readings on log sheet (.1-1.0 mRems/hr acceptable)
* Personal dosimeter-wear when using XRF
  * Landauer, CHP Dosimetry, or Sierra Radiation Dosimetry Service and other manufacturers provide products at low-cost
* LPA-1 note pads

XRF Use & Operation
(LPA-1 specific)

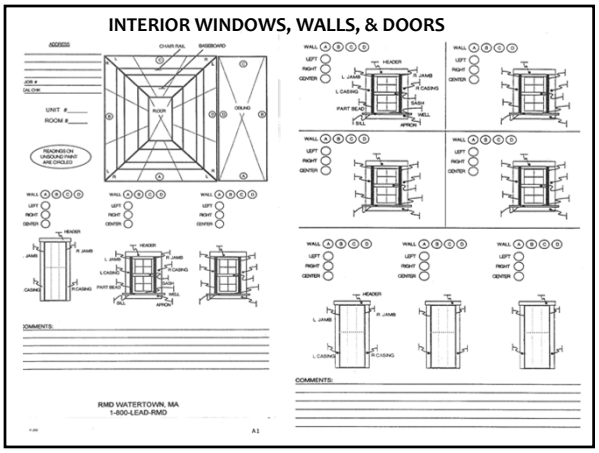
* Choose a job number (new unit)
* Set abatement level (1.0 mg/sq.cm)
* Calibration: In ***"Time Corrected"*** mode (select mode)
  - ✓ measure standard calibration block (1.0 mg/sq.cm.) ***3 times***
  - ✓ record on data form (.7-1.3 acceptable)
  - ✓ measure blank side (0.0 mg/sq.cm.) ***3 times for reference***
* Go to "Quick" mode (select mode) - complete all measurements
* Repeat calibration step at end of job and/or every 4 hours

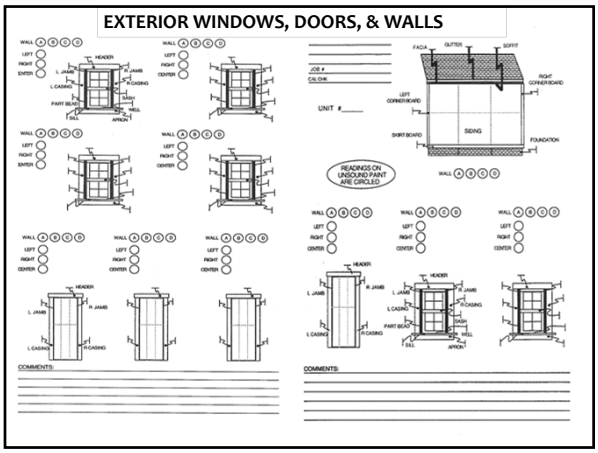
LPA-1 Keypad Controls

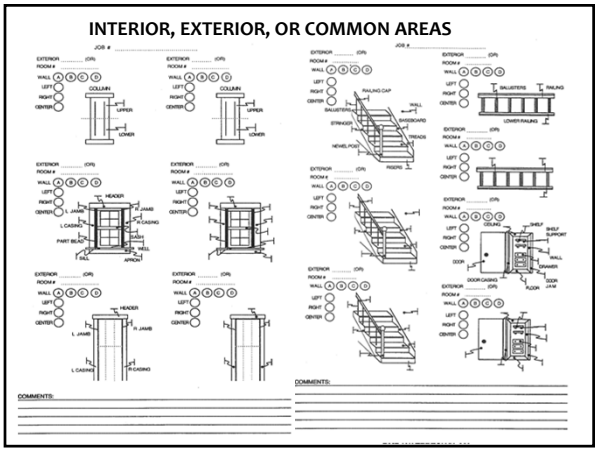
Dynasil LPA-1



INTERIOR WINDOWS, WALLS, & DOORS







How many shots do I need?

It depends on the room…

and

its components

What do I need to test?

Surface testing sites
19a-111-3 (1)

19a-111-3 (1) (A) Interior locations – the following representative surfaces will be tested for the presence of toxic levels of lead

- Baseboard
- Ceiling
- Crown molding
- Floor
- Fireplace
- Radiator
- Door surfaces and side of door frame for a representative interior door
- Shelf
- Shelf support
- Stair riser
- Stair tread
- Stair stringer
- Stair newel post
- Stair railing cap
- Stair balustrade
- Upper wall
- Lower wall
- Chair rail
- Window sash
- Window casing
- Window sill for a representative window
- Representative door and window lintel

Surface testing sites
19a-111-3 (1)

19a-111-3 (1) (B) Exterior locations- for each side of an exterior surface the following representative surfaces will be tested for the presence of toxic levels of lead

- Bulk head
- Porch
- Entrance canopy
- Exterior wall
- Siding
- Lattice
- Ceiling
- Railing
- Railing cap
- Stair stringer
- Stair tread
- Stair riser
- Trim
- Cellar window unit
- Window sill
- Window casing
- Window sash for a representative window

Environmental Samples

* Paint chips
* Dust
* Soil
* Water

Supplies for environmental sampling:

Field Kit

Field Kit supplies:

Tool box
Dust wipes with tubes
Zip lock bags for soil sampling
Water sampling bottles (at least 2)
Labels
Pens- permanent marker
Paint scrapper/hammer

Flashlight
Camera
Tape measure
Tape for template
Safety goggles
Gloves
Spoons

Paint Chip Sampling

Paint Chip sampling is done when:

* Local health department has opted to not utilize XRF
* XRF results are inconclusive (rarity in 2013)
* No flat surface to test
* XRF instrument won't fit in the area to be tested

Paint Chip Sampling

Supplies:

- ✓ Disposable gloves
- ✓ Labels
- ✓ Hard-shell containers
- ✓ Cutting device

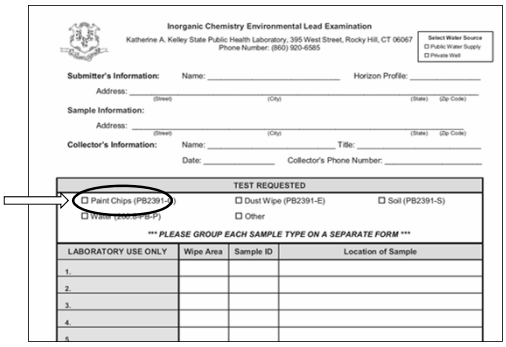
* Note paint condition; document/describe location
* Cut and collect 1-4 sq. inches of paint (sample all layers)
* Place in labeled container and submit to lab

Paint Chip Sampling

*Note: You are responsible for clean up and repairing surface should you damage it

Place paint chips in tubes

Lab Submission Form



Inorganic Chemistry Environmental Lead Examination
Katherine A. Kelley State Public Health Laboratory, 395 West Street, Rocky Hill, CT 06067
Phone Number: (860) 920-6585

Select Water Source
☐ Public Water Supply
☐ Private Well

Submitter's Information: Name: _____ Horizon Profile: _____
Address: _____ (Street) (City) (State) (Zip Code)
Sample Information:
Address: _____ (Street) (City) (State) (Zip Code)
Collector's Information: Name: _____ Title: _____
Date: _____ Collector's Phone Number: _____

TEST REQUESTED
☐ Paint Chips (PB2391-P) ☐ Dust Wipe (PB2391-E) ☐ Soil (PB2391-S)
☐ Water (200.8/PB-P) ☐ Other

**** PLEASE GROUP EACH SAMPLE TYPE ON A SEPARATE FORM ****

LABORATORY USE ONLY	Wipe Area	Sample ID	Location of Sample
1.			
2.			
3.			
4.			
5.			

Paint Chip Sampling

- Results reported in percent by weight or ppm, ug/g, or mg/kg
- Toxic level of lead in paint is **0.5% or 5,000 ppm**
- Make sure all layers are included in the sample
- Inspector must repair surface if it was intact

Interior Lead Inspection
Dust Wipe Tests

* **Initial** Dust Wipe Sampling:

Materials

- ✓ Disposable gloves
- ✓ Wipes – "ghost wipes" preferred
- ✓ Hard shell containers
- ✓ Labels- marker
- ✓ Lab forms
- ✓ 1 sq/ft. template or ruler
- ✓ Masking tape
- ✓ Bag for completed samples
- ✓ Bag for trash

Location of dust wipes samples

Sample floor & sill in each of the following locations:

Children most likely come in contact with dust in the following areas:

- Entry way
- Play area (typically the living or television room)
- Bedrooms
- Kitchen
- Bathroom
- Other locations based on information

Location of dust wipes samples

Within these rooms, components that are likely to have high dust levels:

- **Floors** near friction areas- below a window or door jamb
- Interior **window sills** (window wells are not required for initial inspection- only final clearance)
- Closets or cabinets with deteriorated paint

Dust Wipe Sampling Methodology

Sampling procedure
- Select test location
- Label containers

Floor
- Measure 1 sq. ft, use "S" motion twice: once left to right, then fold, then once top to bottom, then fold, and put in container

Window sill
- Label container
- Record dimensions of sill
- Wipe entire horizontal area- "S" motion, place wipe in container

Avoid Cross Contamination between wipe samples

- Always change gloves for each sample collected
- After donning glove do not touch anything other than the wipe and the surface to be sampled
- Fold the wipe completely before inserting it in the tube
- Considering pre-labeling dust wipes tubes

Lab Submission Form

Inorganic Chemistry Environmental Lead Examination

Katherine A. Kelley State Public Health Laboratory, 395 West Street, Rocky Hill, CT 06067
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Sample Information:
Address: _____ (Street) (City) (State) (Zip Code)

Collector's Information: Name: _____ Title: _____
Date: _____ Collector's Phone Number: _____

TEST REQUESTED

☐ Paint Chips (PB239
☐ Dust Wipe (PB2391-E)
☐ Soil (PB2391-S)
☐ Water (200.8-PB-P)
☐ Other

*** PLEASE GROUP EACH SAMPLE TYPE ON A SEPARATE FORM ***

LABORATORY USE ONLY	Wipe Area	Sample ID	Location of Sample
1.			
2.			
3.			
4.			
5.			

Lab Submission Form

- Submit two blanks minimum
- For each additional 10 dust samples, submit an additional blank
- Include the dimensions of the tested area
  - For example: 1 x 1 ft. or 4" x 22"
- Unit of measure for total lead present is reported in micrograms per square foot (ug/ft^2)

Dust Hazard Standards: Initial Inspection

<u>CT DPH standards</u>:

Floors: ≥ 40 ug/ft^2

Interior Window Sills: ≥ 250 ug/ft^2

Something to consider…

1 packet of sweetener= 1 gram =1 million micrograms (µg)

Spread one packet over **100** rooms that are 10x10 ft

100 rooms x 10'x10' = 10,000 ft^2

$$\frac{1{,}000{,}000\ \mu g}{10{,}000\ ft^2} = 100\ \mu g/ft^2$$

Something to consider…

It doesn't take much lead dust
to fail a clearance dust test
OR

to poison a child

Water Sampling

* Evaluate lead exposures via water
  * Water service lines within the home
  * Fixtures
* Notify local water authority if problems beyond owner's service line

* **15 ppb-action level**

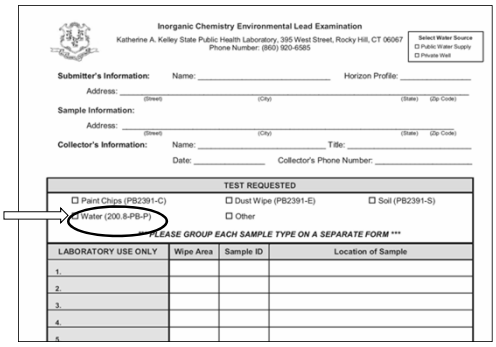
Water Sampling Methodology

- ✓ Obtain sampling bottles from DPH lab
- ✓ Label bottles

Take two samples per dwelling

- ✓ First draw from cold water kitchen tap
  (or 6 hours standing)
- ✓ Second draw after 2 minutes of flushing

Lab Submission Form



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Sample Information:
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Collector's Information: Name: _____ Title: _____
Date: _____ Collector's Phone Number: _____

TEST REQUESTED		
☐ Paint Chips (PB2391-C)	☐ Dust Wipe (PB2391-E)	☐ Soil (PB2391-S)
☐ Water (200.8-PB-P)	☐ Other	

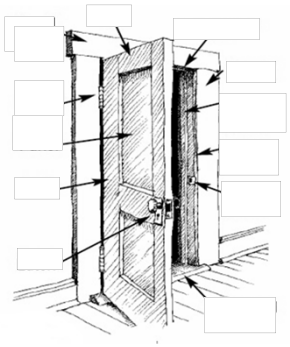
****PLEASE GROUP EACH SAMPLE TYPE ON A SEPARATE FORM ****

LABORATORY USE ONLY	Wipe Area	Sample ID	Location of Sample
1.			
2.			
3.			
4.			
5.			

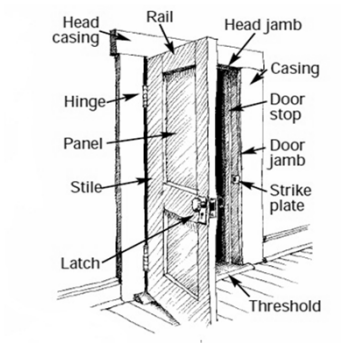
Common Areas of Multi-unit Dwellings

1. Identify areas:
   - ✓ use A,B,C,D orientation
   - ✓ i.e., hallways, stairwells, windows, porches etc.
2. Take XRF readings and dust wipe samples
3. Record on proper forms

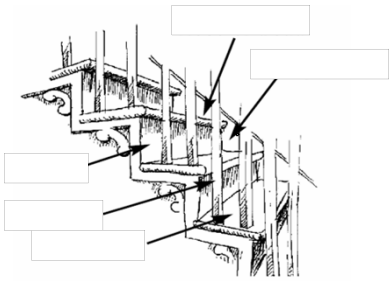
DOOR COMPONENTS



DOOR COMPONENTS



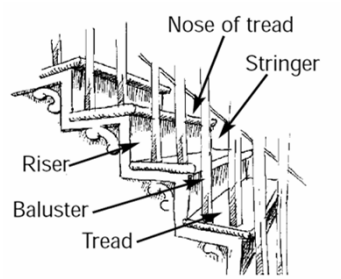
STAIR COMPONENTS



OTHER COMPONENTS NOT SHOWN:

Newel post or Railing cap

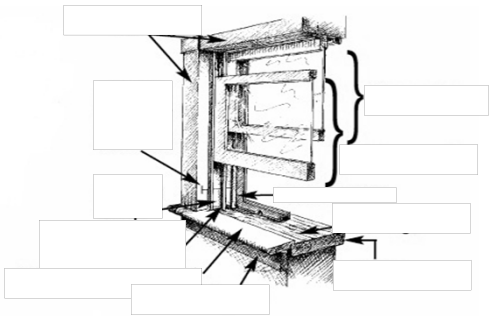
STAIR COMPONENTS



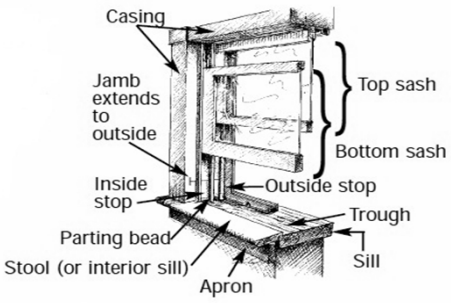
OTHER COMPONENTS NOT SHOWN:

Newel post or Railing cap

WINDOW COMPONENTS



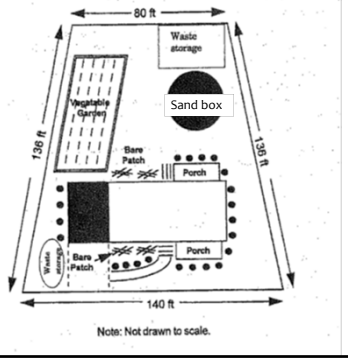
WINDOW COMPONENTS



EXTERIOR LEAD INSPECTION
XRF, soil, paint chip

* Walk/survey the property
* Use A,B,C,D orientation
* Sketch all exterior buildings/structures
    * detached garages
    * porch
    * sheds
    * play area/play ground equipment
    * gardens

Sketch of Property with details



Exterior Lead Inspection
XRF

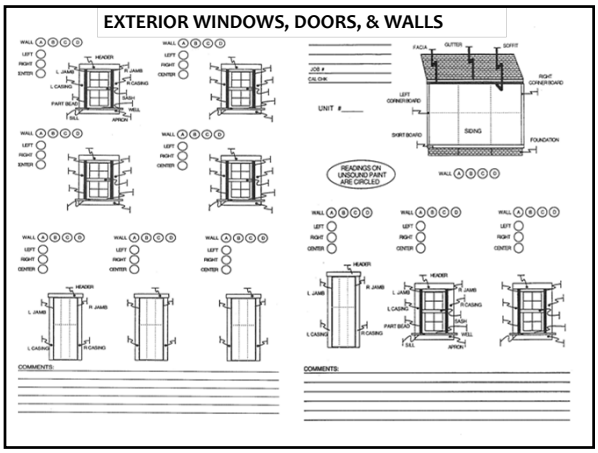
XRF readings on all painted surfaces per 19a-111-3(a)(1)(B):

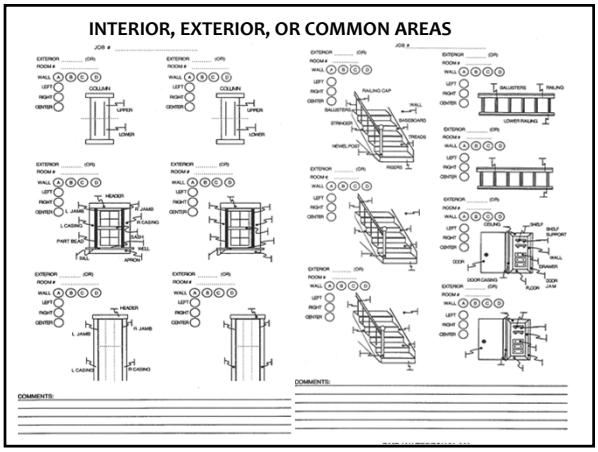
* Bulkhead
* Porch
* Entrance canopy
* Exterior wall
* Siding
* Lattice

Exterior Lead Inspection
XRF

XRF readings on all painted surfaces per 19a-111-3(a)(1)(B):

* Ceiling
* Railing and cap
* Stair stringer, treat, riser
* Trim
* Cellar window unit
* Window sill, casing, sash





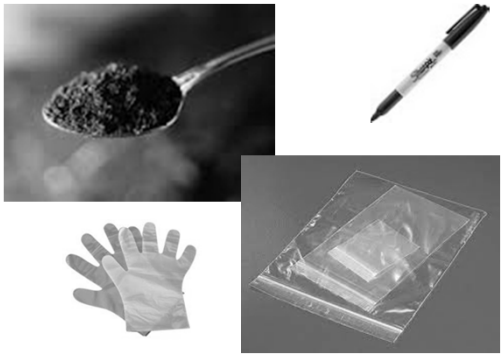
Exterior Lead Inspection
Soil Sampling

- Sample bare soil
  - Drip line, Play areas, Gardens, Other bare soil areas
- Document sampling methodology (grab vs. composite)
- Results are reported in ppm or ug/mg
- **Soil Hazard Standards**
  - **>400 ppm = control hazard**
  - **>5,000 ppm = permanent abatement method**

Exterior Lead Inspection
Soil Sampling

Supplies

- ✓ Wide mouth plastic jars – zip lock bags
- ✓ Plastic spoon or coring device
- ✓ Gloves
- ✓ Labels, marker
- ✓ Sketch



Exterior Lead Inspection
Soil Sampling

Procedure

- ✓ Determine collection locations
- ✓ Note sample locations on exterior sketch
- ✓ Label containers

Soil Sampling Methodology

Grab sampling:

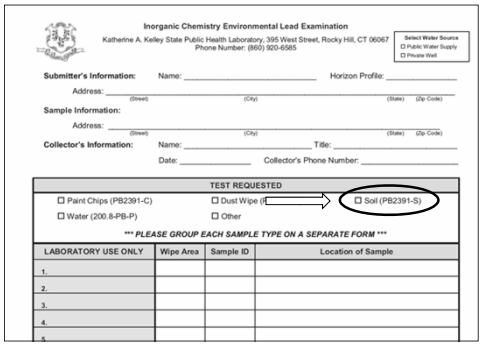
- ✓ One sample per sample location
- ✓ Use core tool or plastic spoon
- ✓ Depth of soil to be sampled: top ½ inch
- ✓ Include paint chips if present

Soil Sampling Methodology

Composite soil sampling:

- ✓ Multiple grab samples equidistant over an area
- ✓ Combine grab samples from one side of the dwelling into one composite
- ✓ Use core tool or plastic spoon
- ✓ Go to ½ inch deep
- ✓ Include paint chips if present
- ✓ No more than 10 grabs per composite

Lab Submission Form



Inorganic Chemistry Environmental Lead Examination

Katherine A. Kelley State Public Health Laboratory, 395 West Street, Rocky Hill, CT 06067
Phone Number: (860) 920-6585

Select Water Source
☐ Public Water Supply
☐ Private Well

Submitter's Information: Name: _____ Horizon Profile: _____

Address: _____ (Street) (City) (State) (Zip Code)

Sample Information:

Address: _____ (Street) (City) (State) (Zip Code)

Collector's Information: Name: _____ Title: _____

Date: _____ Collector's Phone Number: _____

TEST REQUESTED		
☐ Paint Chips (PB2391-C)	☐ Dust Wipe (F	☐ Soil (PB2391-S)
☐ Water (200.8-PB-P)	☐ Other	

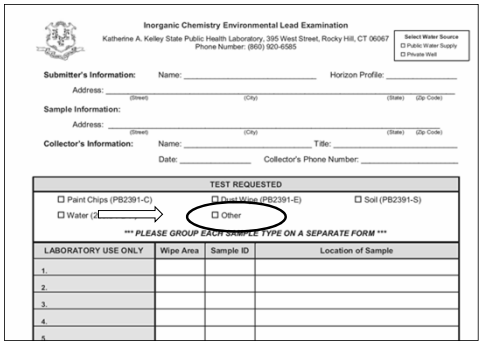
**** PLEASE GROUP EACH SAMPLE TYPE ON A SEPARATE FORM ****

LABORATORY USE ONLY	Wipe Area	Sample ID	Location of Sample
1.			
2.			
3.			
4.			
5.			

Other Environmental Samples

- Spices
- Pottery
- Toys
- Cosmetics
- Candy
- Candy wrappers
- Ayurvedics
- Hobby supplies

Lab Submission Form



Inorganic Chemistry Environmental Lead Examination

Katherine A. Kelley State Public Health Laboratory, 395 West Street, Rocky Hill, CT 06067
Phone Number: (860) 920-6585

Select Water Source
☐ Public Water Supply
☐ Private Well

Submitter's Information: Name: _____ Horizon Profile: _____
Address: _____ (Street) (City) (State) (Zip Code)

Sample Information:
Address: _____ (Street) (City) (State) (Zip Code)

Collector's Information: Name: _____ Title: _____
Date: _____ Collector's Phone Number: _____

TEST REQUESTED

☐ Paint Chips (PB2391-C) ☐ Dust Wipe (PB2391-E) ☐ Soil (PB2391-S)
☐ Water (2 ☐ Other

**** PLEASE GROUP EACH SAMPLE TYPE ON A SEPARATE FORM ****

LABORATORY USE ONLY	Wipe Area	Sample ID	Location of Sample
1.			
2.			
3.			
4.			
5.			

POST ABATEMENT INSPECTION

Code Enforcement Officials **Only**	Code Enforcement **Or Consultants**
∗ **Re-Inspection**-reviewing completeness of abatement within 10WD after notification, No residue, work done according to plan ∗ **Post Abatement Inspection Report:** 2 WD after re-inspection is completed – certified mail or hand-delivered	∗ **Re-Occupancy Inspection** inspector ensures Plan followed, all removed paint surfaces through XRF testing, dust wipe clearance sampling locations in all areas of abatement ∗ **Letter of Compliance:** issued after dust wipes come back as OK, 5WD

Post Abatement Visual Inspection

It is the responsibility of the LHD to ensure that all abatement activities outlined in the approved Abatement Plan have been completed according to the plan.

Post Abatement Testing is Dependent on Abatement Methods Utilized

TYPES OF ABATEMENT:		TYPE OF TESTING:
Window/door/trim replacement	⇒	Clearance dust wipes
Chemical peels	⇒	XRF testing
Encapsulants	⇒	Clearance dust wipes
Soil covering or removal	⇒	Visual verification

Post Abatement Testing is Dependent on Abatement Methods Utilized

TYPES OF ABATEMENT		TYPE OF TESTING:
Enclosure	⇒	Clearance dust wipes
Soil tilling/mixing	⇒	Soil sampling
Encapsulation- exterior	⇒	Visual / dust wipes (porch)

Clearance Dust Wipes

Clearance Dust Wipe Testing must occur in:

* Every room where abatement work occurred
* Common areas where abatement occurred
* Areas used to enter/exit abatement area (w/in 10')

Clearance Dust Wipes

Follow same methodology as initial dust wipe sampling except ***ADD WINDOW WELLS***.

* Submit two blanks minimum
* For each additional 10 dust samples, submit an additional blank
* Include the dimensions of the tested area (1 x 1 ft. or 4" x 22")

Clearance Dust Wipe Standards:

Floors: < 40 µg/sq. ft.

Window sills: < 250 µg/sq. ft.

Window wells: < 400 µg/sq. ft.

Post Abatement Inspection: Soil

Testing type dependent on the type of soil abatement:

Removal/replacement: test replacement soil prior to placement or request copies of lead test from contractor

Placement of mulch/grass seed: visual inspection, verify depth of material per plan

Tilling/ mixing: test soil

Post Abatement Inspection: Soil

CT Soil Clearance Standard:

< 400 µg/sq. ft

Waste Disposal

- Homeowner is allowed to dispose of up to 10 cubic yards of abatement generated waste
- Anything > 10 cubic yards or a whole building demolition must be evaluated using TCLP testing
- ✓ Careful handling of all LBP waste is important whether exempt or not
- TCLP (Toxicity Characteristic Leachate Procedure) is the test normally used to determine if waste is hazardous
  - Hazardous waste: 5 mg/kg, 5 mg/l or 5 PPM

Waste Disposal

For additional information on hazardous waste handling requirements

CT DEEP:
Ross Bunnell
860-424-3274

Hazardous Waste

Dr. Katherine A. Kelley Public Health Laboratory
395 West Street
Rocky Hill, CT 06067

MAIN NUMBER
860-920-6500

FAX
860-920-6710

Sample/Specimen Receiving
860-920-6680

Outfitting (Supplies)
860-920-6674/6675

POC - Lead Samples:
Jack Bennett:
(860) 920-6504