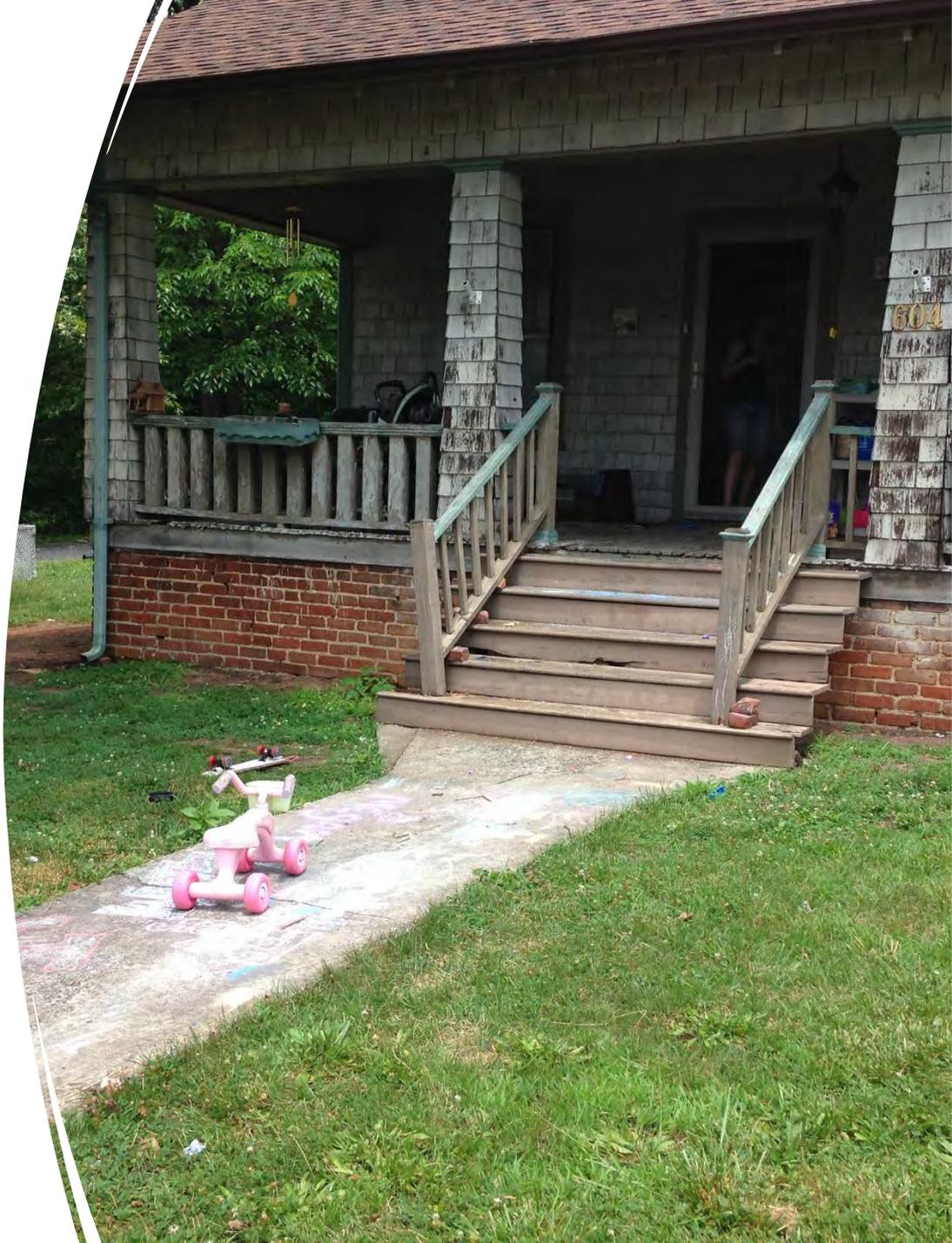


# Environmental Investigation of Child Lead Poisoning Hazards

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**Children's Environmental**  
**Health**  
**NC DHHS/Division of Public**  
**Health**  
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Many children are exposed to lead poisoning hazards in their environment. Exposure can come from many sources such as paint, dust, soil, water, consumer and food products, family hobbies and occupations.

A child's primary mode of exposure is through ingestion from normal hand to mouth activity.

Lead-based paint is the most widespread and dangerous high-dose source of lead exposure for young children.

# When Do We Investigate?

## **All cases of confirmed lead poisoning (CLP)**

- blood lead levels  $\geq 10$  ug/dL
- 2 samples (consecutive)
- within 12 months
- the investigation is mandatory – it's the law!

## **We offer a home investigation for all cases of elevated blood lead level (EBL)**

- blood lead levels is 5 - 9 ug/dL
- 2 samples (consecutive)
- within 12 months
- the investigation is voluntary with signed consent

## **Pregnant Women**

- State law includes environmental investigations and remediation for pregnant women with similarly elevated blood lead levels. In cases of pregnant women the focus is on investigation and remediation of the primary residence, AND referrals must come directly from a medical provider.

# Purpose of the Environmental Investigation



Identify Lead Poisoning Hazards



Educational opportunity for parents, child care providers, school personnel



Discuss Interim Control Measures



Discuss the importance of proper maintenance and repairs

# Records Review

- Review records prior to going out in the field:
- Check NCLEAD to confirm blood lead levels
- Review provider notes/concerns/look for sibling information on past investigations, property status, language, etc.
- Google earth picture of the home and neighborhood
- Confirm investigation and follow up before appointment
- Tax card will confirm date(s) of construction and ownership

# Investigation Team

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From left to right:

- Nellie Benitez - Lead Outreach Worker and Spanish Language Translator
- Lisa Morgan – Food and Lodging Supervisor and Authorized Lead Agent
- Elizabeth Fridley - RN, Child Health Nurse
- David Brown – Regional Environmental Health Specialist



# Plan with Safety and Education in Mind

Your personal safety is paramount – be smart

COVID-19 Protocols

Investigations require a team do not investigate alone

Always leave an itinerary with your office

Always take a charged cell phone and official ID

Never enter a residence if only a minor is home

Approach, demeanor and attitude makes a difference

Always ask the resident if they know why you are there

If needed obtain signed consent

Don't sit on upholstered furniture

Be mindful of where you place and leave your belongings and equipment

Above all be respectful you are in someone's home

Show empathy  
Listen

Provide language appropriate materials

Always look around the corner of the house before walking around a corner

Never trust a rope or chain

You may see guns, weapons and drugs

Park your car where you can easily be seen and get out

# Environmental Investigation

## The Interview

- Take forms and materials with you in the field
- make sure parents know why you are there
- review information provided on the 3651 form and verify (name, address, date of birth, parents' names, length of time at residence, supplemental addresses, Medicaid number)
- discuss potential sources of lead exposure in the child's environment
- Identify sleeping and play areas
- Habits and hobbies

# Investigate

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Areas of curiosity and mouthable surfaces

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Objects used for pulling to a standing position

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Bathing areas

---

Food preparation, storage and utensils

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Look under, behind and in the small spaces

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Ask questions

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Always ask the child's parents where they think the lead exposure is occurring

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Document your findings, sketches, diagram

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Record XRF readings

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Does the child consume any homemade or foreign manufactured herbs, vitamins, teas, medications or supplements home remedies?

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Travel

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Mouthable objects

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Home hobbies

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Food preparation, diet and spices

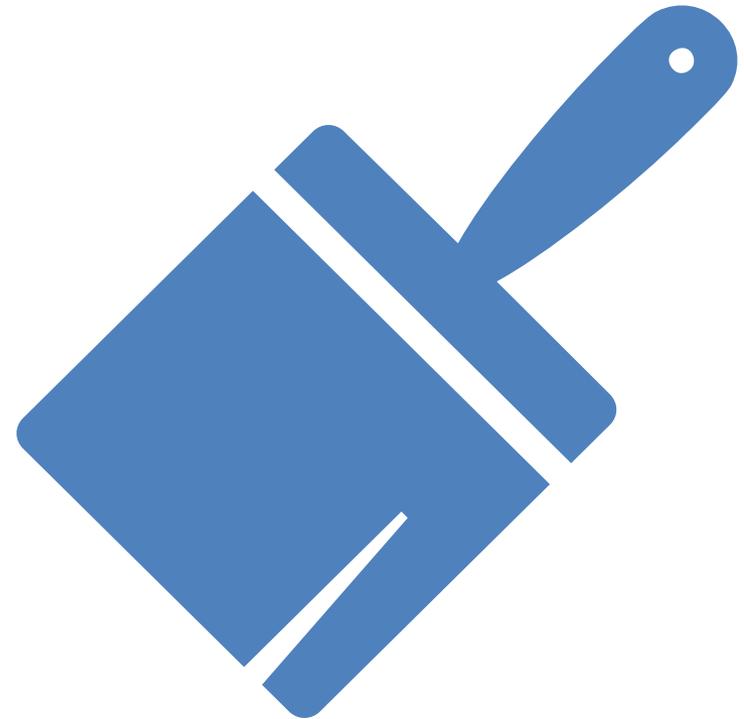
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What is their potable water source

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PAINT

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# 8 PAINTERS IN EVERY 10 USE DUTCH BOY

(According to an impartial, nationwide survey)



## Facts Show "Cheap"

**M**ANY a man who has had a cheap paint job on his house will tell you that all he got for his money was a job that would last for a few months. And "cheap" paint is just what you need for a job that will last for two years. If you get a cheap paint job, you might last that long. A Dutch Boy job, on the other hand, costs more than the "cheap" job. But a Dutch Boy job is what all painters will tell you is the best for five and even ten years. It costs only \$67.50 a year, therefore, Dutch Boy is the "cheap" paint. . . . and provides a job that will last for every year for years to come. And that isn't all. A Dutch Boy job will tell you that it may double your life by preventing cracking and scaling, and by preventing burning and staining. A Dutch Boy job has the smooth finish that gives your house a perfect surface. A Dutch Boy painter is a Dutch Boy White-Lead painter.

Write for free literature "How to Live In"—which will tell you how to decorate the home. Address: Dutch Boy White-Lead Co., 111 Broadway, New York, N.Y.



NATIONAL LEAD COMPANY—New York, 111 Broadway—Buffalo, 116 Oak Street—Chicago, 900 W. 65th Street—Cleveland, 8211 E. Superior Avenue—St. Louis, 722 Chestnut Street—San Francisco, 2240 24th St.—Lead Co., 300 Albany Street—Pittsburgh, National Lead & Oil Co. of Pa., 316 Fourth Avenue—Philadelphia, John T. Lee

## Why was lead-based paint so popular?

The durability of lead made it an excellent paint additive, but the sweetness made it tempting to young children to eat.

## But was it safe?

Childhood lead poisoning was linked to lead-based paints in 1904. Several European countries banned the use of interior lead-based paints in 1909.

In 1922, the League of Nations banned lead-based paint but the United States declined to adopt this rule.

In 1943, a report concluded that children eating lead paint chips could suffer from neurological disorders including behavior, learning, and intelligence problems.



Lead-Based Paint

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Selling  
quality!

*Caps Off!* to  
**BLENDED** Paint  
for Lasting Beauty!

**To keep Your Home Bright  
My Paint's **Blended** Right...  
Ready-mixed, in Colors or White!**

Bright as the "Dutch Boy's" bright blue cap  
... sparkling as the sun on his golden hair  
... lasting as his cheery smile  
... that's "Dutch Boy," the Paint with the  
*Happy Bl-ENDING!*

Why is "Dutch Boy" Paint **BLENDED**?  
Because different parts of a house call for  
different types of paint.

And blending brings you the right com-  
bination of the right ingredients to do each

job right... blended by the master hand  
of the "Dutch Boy," whose fame as a  
paint-maker is nation-wide.

So choose... from White or Tints, Trim  
Colors, Porch & Deck Paint, or Primer  
... the "Dutch Boy" Paint that's *blended  
just right to KEEP your home bright!*

Look for your "Dutch Boy" Dealer's  
name in your classified telephone direc-  
tory. Mail the coupon for free booklet.

**1. BRIGHT WHITE *Blended* to Clean Itself!**  
"Dutch Boy" Bright White is specially blended to be  
*self-cleaning!* The surface continually renews itself  
... permits rain to wash away dirt. Sets a new standard  
for hiding! Gives a dazzling white finish that stays white!

**2. TINTS *Blended* to Stay True!**  
"Dutch Boy" Tints are beautifully crisp  
and fresh... and they're expertly  
blended to assure *lasting, uniform* color!

**3. TRIM COLORS *Blended* to Stay Bright!**  
"Dutch Boy" Sash & Trim Colors add the  
finishing touch to your home's protection.  
They're blended to *hold their bright, gay  
glow!* Wonderful for garden furniture, too!

**4. PORCH & DECK *Blended* to Stand Wear!**  
"Dutch Boy" Porch & Deck Paint is  
blended for extra toughness. It laughs at  
punishment from foot traffic and weather!

**5. PRIMER *Blended* to Seal, Hide and Hold!**  
An undercoat of great sealing and hiding power, that holds  
fast. When used under a topcoat of "Dutch Boy" Bright White  
or Tints you get a superior two-coat job... *even on unpainted wood!*

**FREE Color-Scheme Booklet!**  
Over 40 full-color illustrations show you how to style your  
home for Blended Beauty with the  
new "Dutch Boy" Paints. For your  
free copy, address Dept. 48, one  
of the nearest office listed below.

**MAIL COUPON TODAY!**

NATIONAL LEAD COMPANY,  
Dept. 48 (Address nearest office): New York 6; Buffalo 3;  
Chicago 8; Cincinnati 3; Cleveland 13; Pittsburgh 12; St.  
Louis 1; San Francisco 10; Boston 6 (National Lead Co.  
of Mass.); Philadelphia 25 (John T. Lewis & Brok. Co.).

Please send me a free copy of your new  
color-illustrated booklet, "Blended Beauty  
For Your Home."

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

**National Lead Company**

BETTER HOMES & GARDENS, APRIL, 1949

# Women Do Not Paint

but they should know something about the paint their painters use.

"I suppose in nine cases out of ten it is the wife who first suggests that the house is looking shabby and needs repainting," said a friend of the Dutch Boy the other day.

"Yes," was the reply, "but she should go farther and interest herself in how it is painted. Then she wouldn't have to call John's attention to the shabbiness of the house so often."

When women learn how much they

## "Dutch Boy Painter" Pure White Lead

can trust ordinary paint, they will learn to do so. *Always*, use the color of knowing the best looking one.

Moreover, we have some painting literature especially interesting to you—bearing particularly on the usefulness of genuine white lead paint in home decoration. Send for "Paint Hints No. 367" and remember that a *pure white lead* is a *lean wall paint*.

The pure lead is used in making paints containing 25% to 35% of zinc oxide, and makes all white and colors of the palette. One gallon to one bushel.

### National Lead Company

New York      Boston      Chicago  
 Philadelphia      St. Louis      Cincinnati  
 Cleveland      Detroit      Pittsburgh, Pa.  
 Head Office: 100 N. 5th St., Philadelphia, Pa.  
 Telephone: 1-1000



Even first-time painters get beautiful results!

## "Dutch Boy" Nalplex is the easy wall paint!



# Lead Poisoning Trifecta



**1978**

**Lead-based paints were banned for residential use in 1978.**

*When was lead paint banned in the EU? Use of **lead**-based interior paints was **banned** in France, Belgium and Austria in 1909. Much of Europe followed suit before 1940. It took the U.S. until 1978 to make this move, even though health experts had, for decades, recognized the potentially acute – even deadly – and irreversible hazards of **lead** exposure.*



**1986**

**Lead solder was banned from use in public water supplies 1986.**

Solder is a fusible metal alloy used to create a permanent bond between metal workpieces. Solder is melted in order to adhere to and connect the pieces after cooling, which requires that an alloy suitable for use as solder have a lower melting point than the pieces being joined



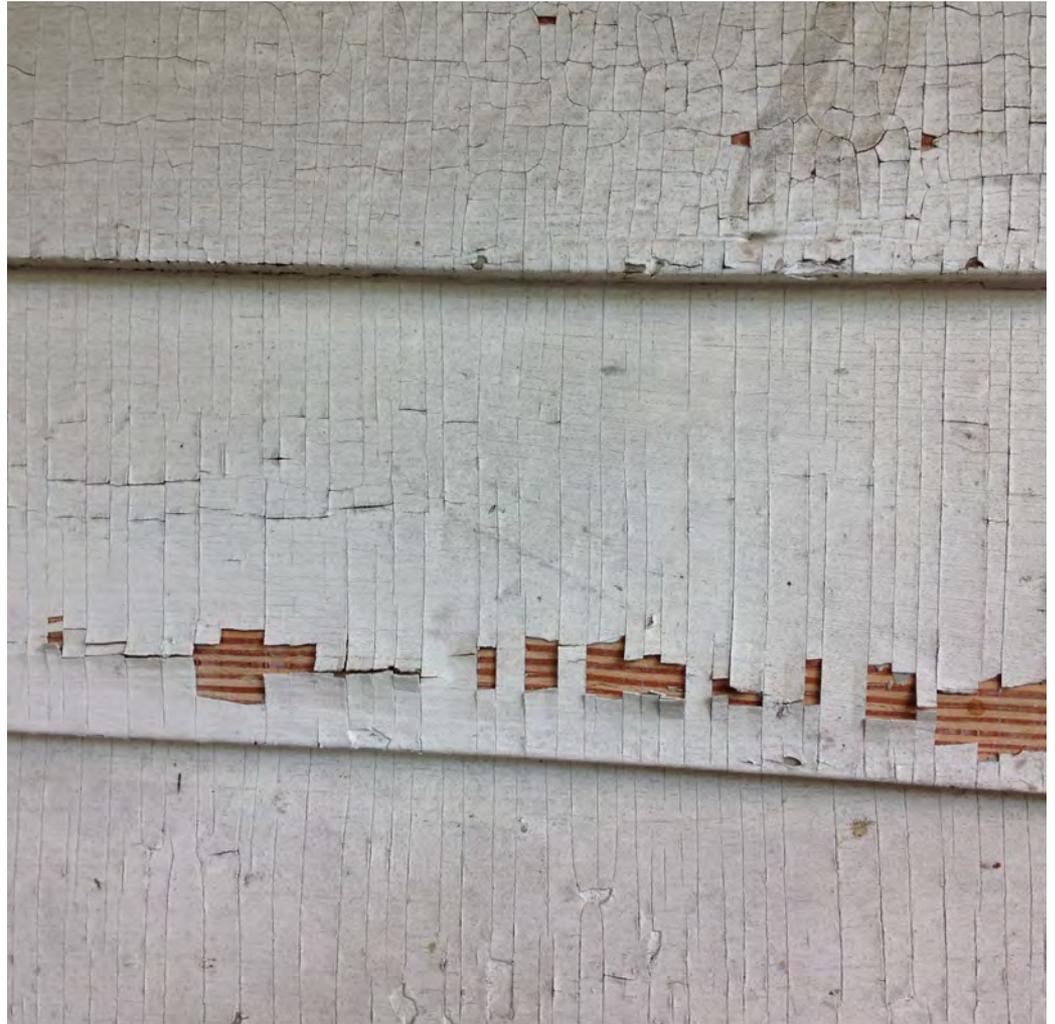
**1996**

**Leaded gasoline was banned from use in all on-road vehicles in the US.**

When did they stop putting lead in gasoline?  
By 1975, unleaded gasoline was universally available.  
Effective **January 1, 1996**, leaded gasoline was banned by the Clean Air Act for use in new vehicles other than aircraft, racing cars, farm equipment, and marine engines.  
Lead has been blended with gasoline, primarily to boost octane levels, since the early 1920s.

# Lead-based Paint

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Generally, we are not too concerned with paint in good condition, however, examine and sample readily accessible:

- Deteriorated paint
- Loose and flaking paint
- Paint chips on surfaces
- Friction and impact surfaces

Readily  
Accessible  
Substance  
*substances*  
*that can be*  
*ingested or*  
*inhaled by a*  
*child less*  
*than six years*  
*of age*

- Includes deteriorated paint that is peeling, chipping, cracking, flaking, or blistering to the extent that the paint has separated from the substrate.
- Also includes dust, soil, water, toys, vinyl miniblinds, doors and jambs, stairs, railings, windows, interior sills, baseboards and other components.

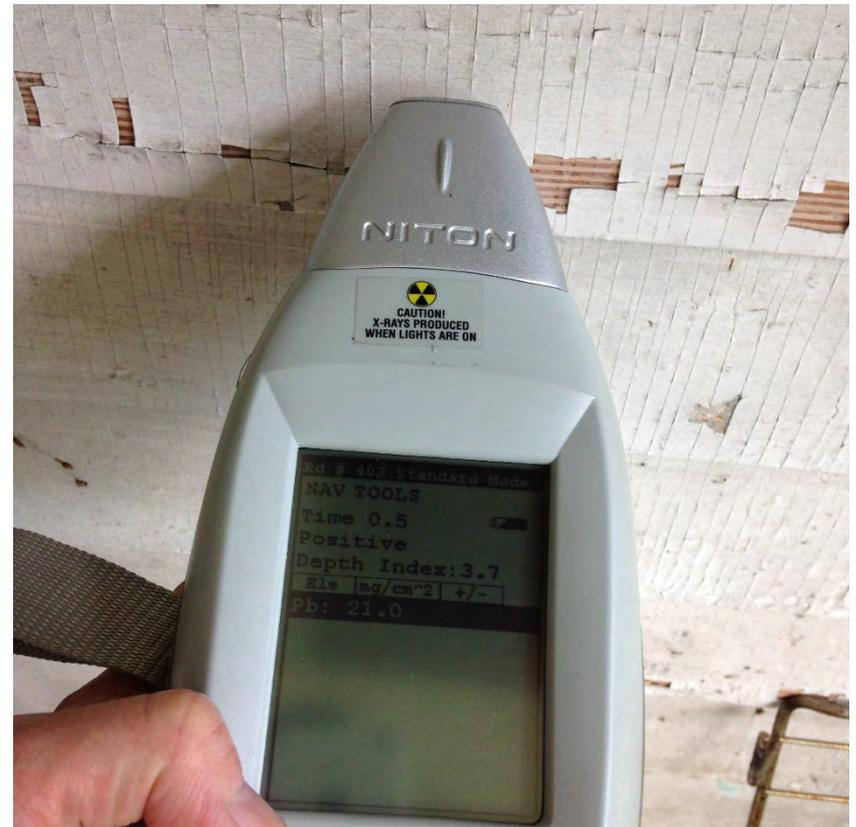
# X-ray Fluorescence Analyzer

The primary field method for providing quantitative analysis of surface coatings and substrates is the X-ray Fluorescence Analyzer (XRF).

# XRF Units



# Field Testing with XRF



1

XRF analysis the most cost effective and quickest method of screening a large number of surfaces.

2

Lead content is expressed in milligrams per square centimeter  $\text{mg}/\text{cm}^2$

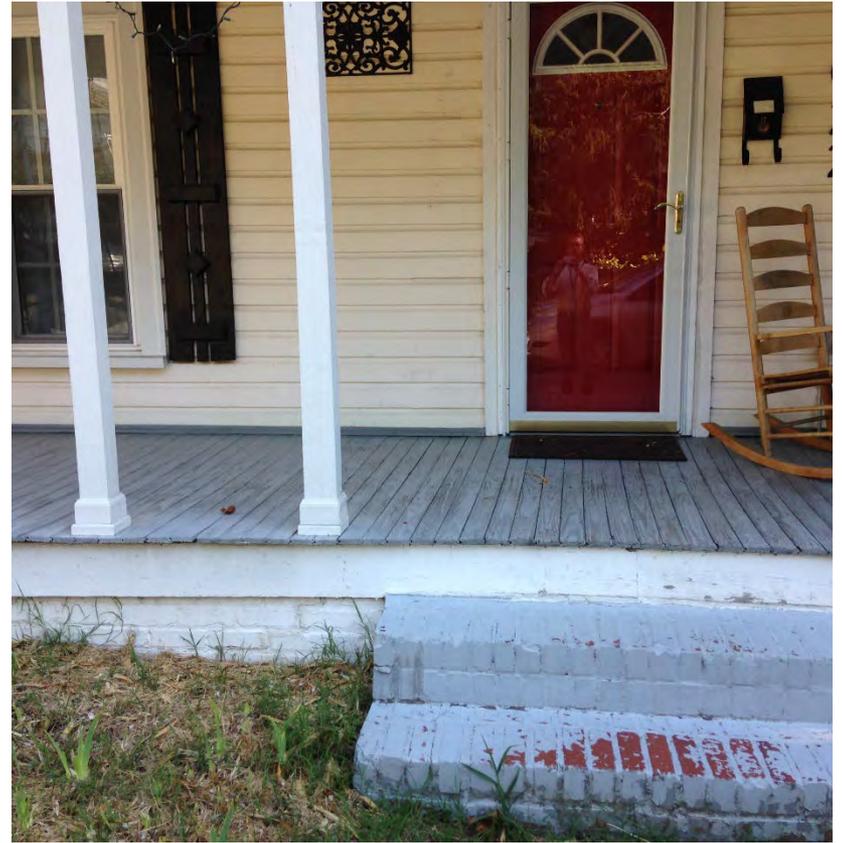
3

1.0  $\text{mg}/\text{cm}^2$  or greater is considered a lead poisoning hazard.

# DIY

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# Mouthable Surfaces

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# Painted Friction/Impact Surfaces

**Window sashes**



**Door jambs**



# Sample Collection and Analysis

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Another quantitative method of determining hazards is by laboratory analysis.

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Paint, dust, soil, water and .... other stuff!

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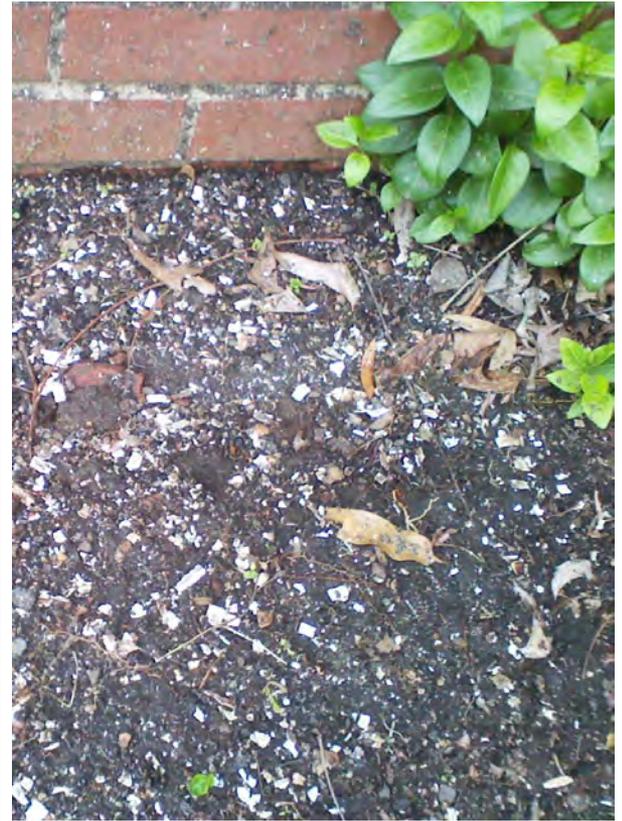
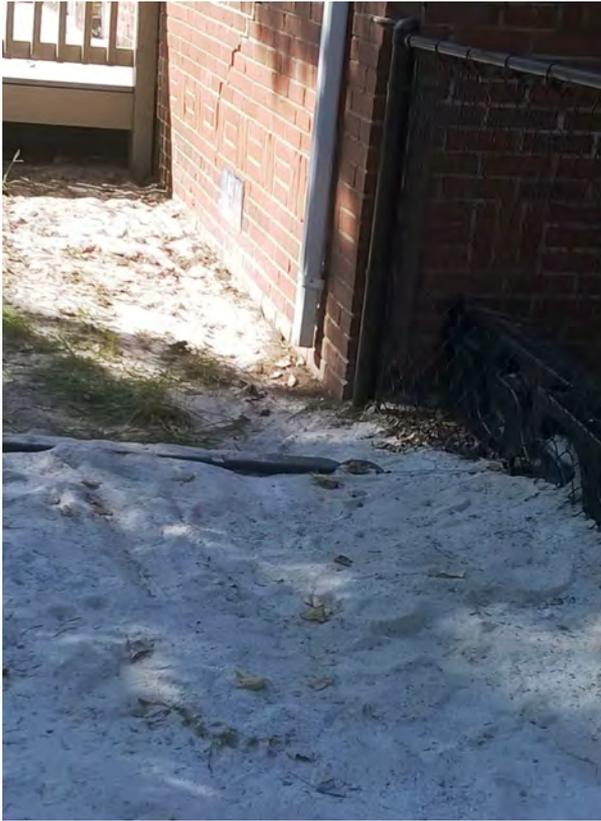
Normally samples are submitted to the State Laboratory of Public Health where lead content is determined by atomic absorption spectroscopy (AAS).

## Chemical Analysis

Lead content is reported as percent by weight

0.5% or 5000 ppm is considered a lead poisoning hazard





**SOIL**

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# Soil Hazard Levels

Soil hazard levels are reported in parts per million (ppm) of lead. A lead poisoning hazard is any concentration of lead in bare soil:

≥ 400 ppm in play areas, gardens, pet sleeping areas, and areas within three feet of a residential housing unit or child-occupied facility.

≥ 1200 ppm in other locations of yard



# Dust

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Floors, porches, windowsills, miniblinds, workshop and home hobby areas, laundry areas

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Other items/areas are sampled based on information obtained during the visit

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Dust hazards occur as lead-based paint deteriorates, breaks down or is disturbed

- If occupation or hobby is a potential source of exposure you may need to collect dust wipes from work clothes, shoes, car seats, furniture, changing and laundry areas
- Dust sampling is required after remediation



# Dust Hazard Levels

Dust hazard levels are reported in micrograms per square foot ( $\mu\text{g}/\text{ft}^2$ ) of lead. A lead poisoning hazard is any concentration of lead:

$\geq 40 \mu\text{g}/\text{ft}^2$  floors

$\geq 250 \mu\text{g}/\text{ft}^2$  window sills

$\geq 400 \mu\text{g}/\text{ft}^2$  window troughs (clearance only)

# Water

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Hazard Level  $\geq$  15 ppb

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Water is usually contaminated by lead leaching from lead soldered joints, fixtures, or pipes

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Leave the aerator on the mouth of the faucet when sampling

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Normally sample from the kitchen tap

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First draw samples are most useful

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You can also pull a sample from the well head

- Focus on areas where the child spends time inside and outside of the home. Focus on those areas and look for evidence of exposure.







NITON

  
CAUTION!  
X-RAYS PRODUCED  
WHEN LIGHTS ARE ON

NAV TOOLS  
Time 1.8  
Positive  
Depth Index: 4.1  
K<sub>a</sub>: [mg/cm<sup>2</sup>] +/-  
Pb: 2.6



















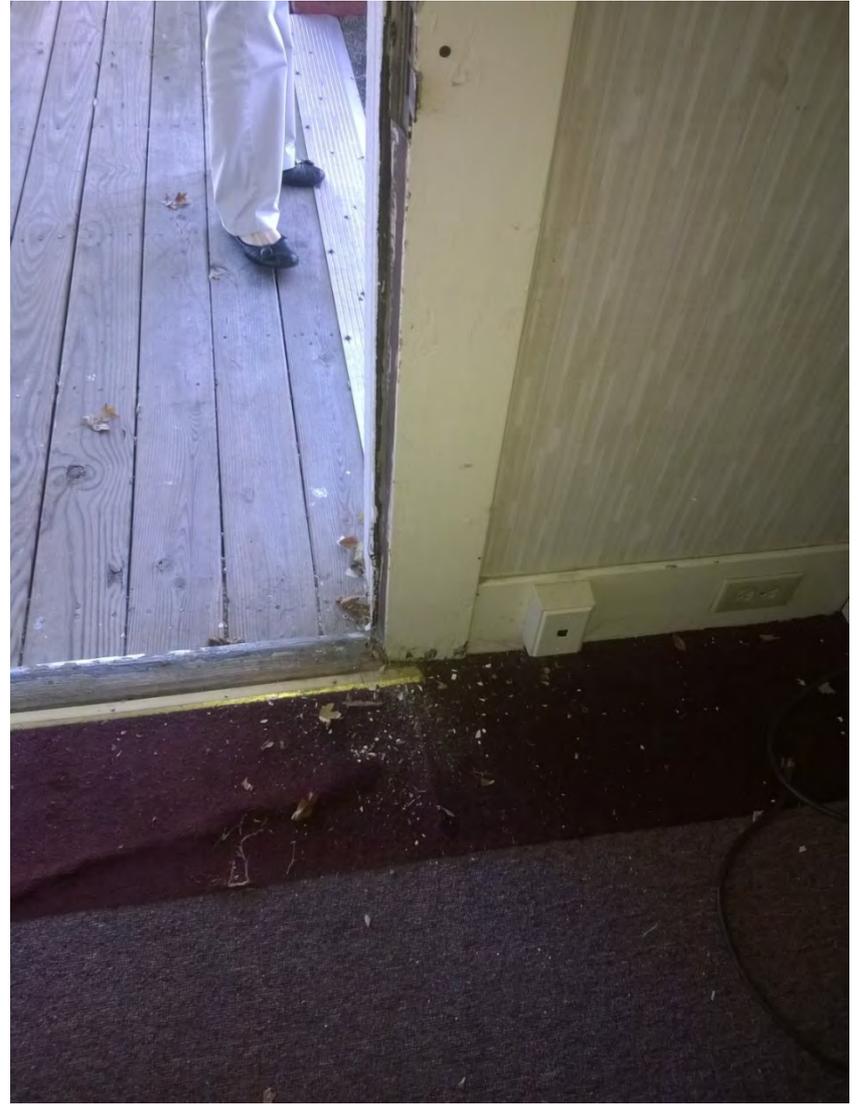


  
CAUTION!  
X-RAYS PRODUCED  
WHEN LIGHTS ARE ON

NAV TOOLS  
Time 0.5  
Positive  
Depth Index: 2.2  
Rate [unintelligible] +/-  
Vol: 22.5













Where do the  
children play and  
spend their  
time?

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# Safe Spaces

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Safe rooms or safe zones in and out of the house.

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Locate play areas away from the house foundation and old structures.

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Older porches and outbuildings often have lead-based paint.

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Who does the repair and maintenance work?

# RRP RULE



North Carolina Department of Health and Human Services  
Division of Public Health • Epidemiology Section  
Occupational and Environmental Epidemiology Branch  
1912 Mail Service Center • Raleigh, North Carolina 27699-1912  
Tel 919-707-5950 • Fax 919-870-4808

Beverly Torres Penick, Governor  
Lambert M. Cantler, Secretary

Jeffrey P. Engel, M.D.  
State Health Director

## North Carolina Requirements for Renovation, Repair, and Painting

North Carolina's Lead Program for Renovation, Repair and Painting (RRP) went into effect January 1, 2010. This Program was initiated in response to US EPA regulations intended to protect building occupants and children from lead-based paint hazards.

The regulations apply to renovation, repair and painting work done for compensation in housing and child-occupied facilities built prior to 1978. They require firms performing renovations in these facilities to be certified by the NC Program, to use a certified renovator on each project, and to train their employees to follow lead-safe work practices.

Housing and child-occupied facilities, such as day-care centers and pre-schools, built prior to 1978 must be assumed to contain lead-based paint unless testing shows that none exists. This determination may be made by a North Carolina certified lead renovator who has tested the components that will be disturbed by the renovation. A written determination by a NC certified lead inspector or risk assessor may also be used to show that there are no lead painted components in the structure.

If lead-based paint is present or assumed to be present in a facility being renovated, the Program requires that the contractor performing the renovation provide owners and occupants with the pamphlet – "The Lead-Safe Certified Guide to Renovate Right." Similar information must be provided to parents and guardians of children under age six who attend pre-school or daycare programs located in structures built prior to 1978. The pamphlet explains the health effects of lead exposure and provides general information on how renovation projects should be conducted in a lead-safe manner.

To get more information on the Renovation, Repair and Painting Program, visit the following website or contact the NC Department of Health and Human Services (DHHS), Division of Public Health, Health Hazards Control (HHC) by calling 919-707-5950; or visit the following website:

North Carolina Lead-Based Paint Hazard Management Program  
<http://epi.publichealth.nc.gov/lead.html>

12012 (08/10)



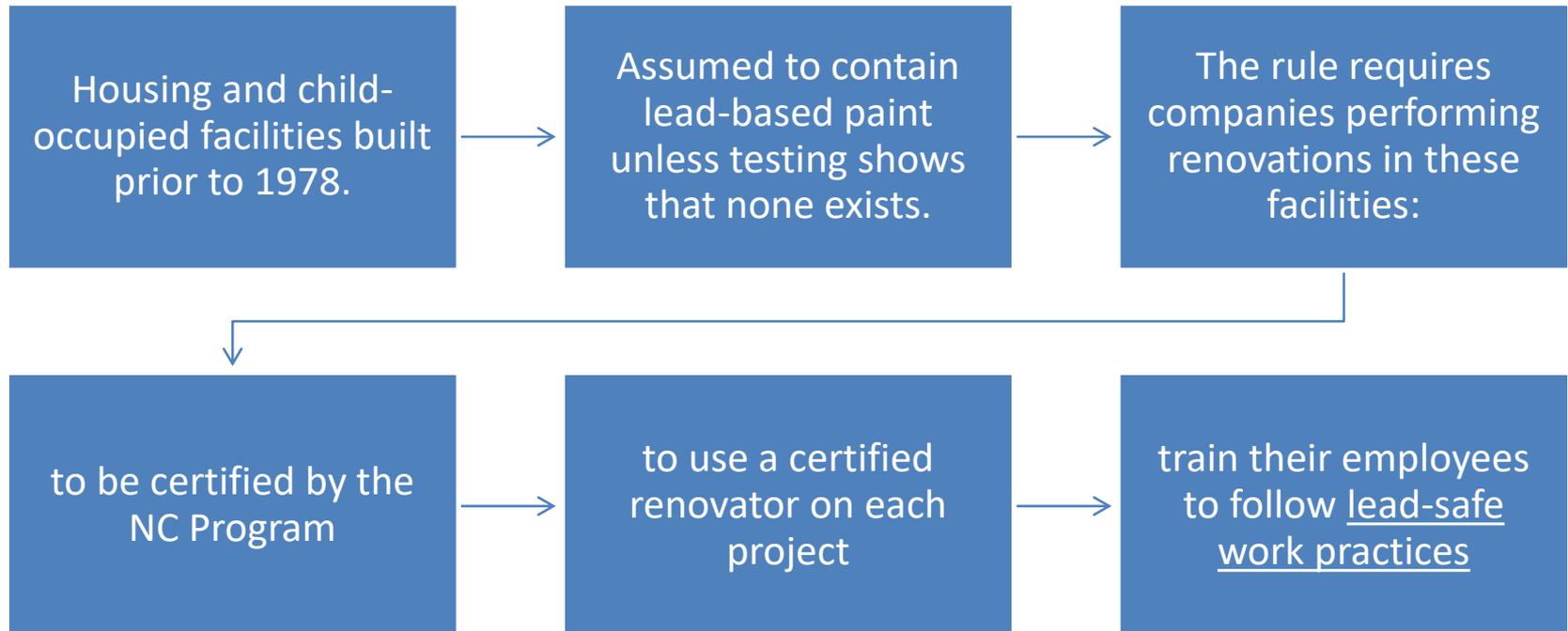
Location: 5505 Six Forks Road, 2<sup>nd</sup> Floor, Room D-1 • Raleigh, N.C. 27609



North Carolina's Lead  
Program for Renovation,  
Repair and Painting  
(RRP)  
Effective January 1, 2010  
Intended to protect  
building occupants and  
children from lead-based  
paint hazards  
Lead-safe work practices



# Who does it apply to?



**Lead  
Contaminated  
Tap Water**  
How does lead  
enter the  
water supply?

Lead and lead compounds have been used in a wide variety of plumbing products: pipes, solders, fixtures, service lines.

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The EPA set the action level for lead in water at 15 ppb and at 1.3 ppm (1.3 mg/L) for copper.

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Before using water for drinking or cooking, "flush" the cold water faucet.

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Clean the aerator screen.



Lead-  
Glazed  
Ceramics





# Folk Medicines and Herbal Remedies

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Lead has been found in powders and tablets given for arthritis, infertility, upset stomach, menstrual cramps, colic and other illnesses.

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Greta (lead oxide) Azarcon (lead tetroxide) are Hispanic traditional remedies taken for an upset stomach (empacho), constipation, diarrhea, vomiting, and used on teething babies. Greta and Azarcon are both fine orange powders that have a lead content as high as 90%.

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Ghasard, an Indian folk remedy, has also been found to contain lead. It is a brown powder used as a tonic.

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Ba-baw-san is a Chinese herbal remedy that contains lead. It is used to treat colic pain or to pacify young children.





# Toys

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High concentrations of lead found in millions of toys produced by Mattel in 2007 has caused them to agree to settle lawsuits in excess of \$50 million. These toys posed a health hazard to children due to the high concentrations of lead in the toys.  
MSNBC – 11/2009

- Dora the Explorer
- Sesame Street toys
- Barbie, Batman
- Polly Pocket
- Serge cars

# The Wrap Up

Complete forms and notes

Collect equipment and samples

Provide educational materials

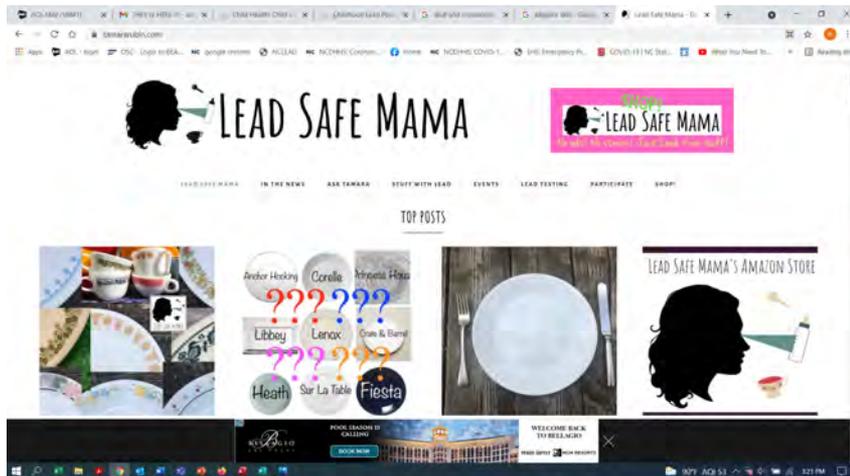
Ask if any questions

Leave contact information

Chain of custody

Package samples

https://tamararubin.com/



https://nchealthyhomes.com/





Thank you!  
You make a difference!