Lead Hazards in Residential Real Estate:
Manual for Property Owners, Managers,

<u>Integrated Program</u> that complies with all lead regulations issued by:

<u>Federal</u>

- **EPA**
- **OSHA**
- **HUD**

and others

<u>State</u>

- **DHS**
  - **Cal/OSHA**
  - **OLPPP**
  - **DTSC**
  - **AQMD**

By Chuck Stewart, Ph.D.

Lead Hazards in Residential Real Estate: Manual for Property Owners, Managers, and Supervisors

Typeset and printed in the United States of America.

Published by Stewart Education Services,
3722 Bagley Ave. #19, Los Angeles, CA 90034-4113
310-838-6247 (v) • 310-838-6769 (f)
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First edition, first printing: February 2005.

ISNB 0-9764154-3-7

Table of Content

LEAD HAZARDS IN RESIDENTIAL REAL ESTATE—MANUAL

This manual may be used as a book on the topic or as a textbook in conjunction with a course on lead hazards.

Inserted loosely at the back of the book are supplemental materials including:

- EPA Protect Your Family From Lead in Your Home (14 pages)
- CDC Lead Paint Safety (82 pages)
- Lead Work Planning Form (10 pages)

A full curriculum with overhead transparencies, handouts, games, and hour long workshop practices DVD are available to those who desire to conduct their own training programs. See the order page at the end of the book or contact www.StewartEducationServices.com.

Curriculum/Manual Development

Until this program, there was no curriculum and manual that specifically targeted the needs of the residential rental industry as related to lead-based paint hazard. Below are listed the seven curricula developed by government agencies to address lead hazard. The curricula from the California Department of Health Services focus on the needs of workers and the responsibility of employers to assure the health and safety of their employees who work around lead. HUD has also developed a number of curricula. Their focus is on protecting the health of residents in federal housing. If owners or property managers and workers of residential rental property follow just one of these curricula, they will be in violation of other laws. OSHA is concerned with worker safety. HUD is concerned with resident safety. Property management industry must protect both. This Manual integrates it all.

Some curricula are better written than others. For example, the Connors course is still accepted by HUD as meeting the training requirements specified by law, but HUD no longer uses it in their own training. Instead, they use portions of the Remedies and Renovators course mixed with the video and field-planning guide that comes from NETA.

This Manual contains all elements of the law, best elements from the public curricula, and all public records related to the topic.

Curricula Used to Create Program

California Department of Health Services

"Painting Contractor's Guide to Lead Safety," by Occupational Lead Poisoning Prevention Program (OLPPP), Occupational Health Branch, California Department of Health Services (DHS), October 1999.

"Lead Safety for Painting and Remodeling Workers: Tailgate Training Handouts," by Occupational Lead Poisoning Prevention Program (OLPPP), Occupational Health Branch, California Department of Health Services (CDHS), July 1994.

"Lead in the Workplace: A guide for employers in general industry," by Occupational Lead Poisoning Prevention Program (OLPPP), Occupational Health Branch, California Department of Health Services (DHS), 2000.

"Lead-Safe School Guide: For maintenance and operations departments," by Labor Occupational Health Program (LOHP) of the University of Californian, Berkeley, by the Childhood Lead Poisoning Prevention Program, California Department of Health Services (DHS), 2000.

HUD

"Lead-Based Paint Training Program for Remodelers and Renovators," U.S. Department of Housing and Urban Development (HUD), Office of Lead Hazard Control. 2000. Available from www.hud.gov/lea/training/rr/HUD_RR_CCOURSE.html.

"Addressing Lead-Based Paint Hazard During Renovation, Remodeling, and Rehabilitation in Federally Owned and Assisted Housing," U.S. Department of Housing and Urban Development (HUD), Office of Lead Hazard Control. February 23, 2001. Available from www.hud.gov/lea/training.

"Lead-Hazard Awareness Training," Connor Environmental Services & Engineering Assessments, A division of Micron, Inc., January 2000.

Private

"Lead-Based Paint Maintenance Training Program: Work smart, work wet, and work clean to work lead safe," by National Environmental Training Association (NETA), Phoenix, AZ, 1997.

No copyrighted materials were used in the creation of this program.

Manual Layout

The Manual is divided into four sections.

Section 1 looks at the sources of lead, how lead came about to be regulated and the health effects of lead on the human body. Section 2 presents legal details as they apply to the residential rental real estate industry. Section 3 discusses the work practices that have been developed by EPA, Cal/OSHA and HUD proven to reduce lead exposure on the job. Finally, Section 4 gives a step-by-step compliance plan applicable to "low-risk" and "high-risk" jobs. The Appendix is comprehensive with the forms needed to fully implement a lead-safe work program besides giving full reproduction of applicable law and contact information.

Stewart Education Services

Stewart Education Services is dedicated to bringing *effective* educational programs to the business community. Furthermore, we are dedicated to offering many of our services in multiple languages.

Some of the services we offer include:

Real Estate Environmental Issues

Lead Hazards Concerns

- Lead Hazard for Owner/Manager/Supervisor (English only)
- Lead Hazard for Workers (in English, Spanish, and Chinese— Cantonese and Mandarin)
- Lead Hazard Worker Refresher Course (in English, Spanish, and Chinese—Cantonese and Mandarin)

Other Environmental Concerns

- Mold in the Workplace (in English, Spanish, and Chinese—Cantonese and Mandarin)

On-Site Training

We come to your place of business and instruct you on-site.

- Lead and Mold Hazards
- Databases, Word Processing, Microsoft Applications
- Planning for Diversity
- Diversity Training on Specific Populations (race, gender, sexual orientation)
- Sexual Harassment Training

About the Author: Chuck Stewart, Ph.D., is a recognized authority on effective education pedagogy. He is an award-winning author of many books and articles describing his research into effective teaching methodology and materials. He began his career as a research physicist in the aerospace industry launching vehicles from Vandenberg Air Force Base and developing high temperature materials for the MX missile and the Space Shuttle. Later, he became an educator earning his Ph.D. from the University of Southern California's School of Education, International and Intercultural Education. He has worked in the residential real estate rental industry for more than 12 years and is the author of a law dictionary for ABC-CLIO Publishers besides other books.

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SECTION 1 • LEAD SOURCES, REGULATION, AND HEALTH EFFECTS

Who Can Use This Manual

This manual contains legal information and work techniques applicable to owners, property managers, and those who perform work (such as contractors, maintenance workers, plumbers, electricians, renovators, remodelers, and painters) for the residential rental industry.

A recent study by the California Department of Health Services found that most rental units in California have lead, primarily in the paint, but sometimes also in the water or soil. EPA, Cal/OSHA and HUD require workers who are, or have the potential of being, exposed to lead to attend "basic awareness" training on lead hazards. That is the intent of this Manual. If the lead level exceeds legal minimums or workers engage in "high-risk" work techniques; then this manual is not sufficient. Workers must be state certified to work under those conditions.

Stewart Education Services provides professional training courses on these topics to which this manual acts as textbook. At the completion of the course, students who pass the final exam will receive a "Notice of Completion" as specified by HUD. As such, workers will be qualified to perform Remodeling and Renovation on HUD funded residential buildings, besides other settings. Note: Some training programs claim to give a "certificate" at the end of the basic awareness training course. This is not accurate. HUD regulations specifically states that it is a "Notice of Completion" so as to not imply certification— something left to the states to regulate. For real estate professionals, these courses qualify for Continuing Education Units. No other training provider in California can make a similar offer.

Not Lead Abatement Training

EPA and HUD define abatement to mean measures intended to permanently eliminate lead-based paint hazards. This type of work requires special training not provided by this course.

For Cal/OSHA, work measures that are of "high-risk," i.e., use "trigger" tasks, require workers to be state certified and is beyond the scope of this training. Furthermore, this course does not meet the training requirements of the OSHA Respiratory Protection Standard or project-specific training requirements found in OSHA.

Goals

When this book is used in tandem with a lead hazards training program, the goals of the training include:

- All participants will learn of the hazards lead presents to workers and residents, including the health consequences to high levels of lead in the blood.

- Residential rental property owners and managers will become aware of the laws affecting their properties as related to lead hazards and be provided the tools to develop an integrated program to assure compliance to all aspects of the law.

- Upon completion of this course, participants will be able to perform maintenance, renovation, remodeling, and rehabilitation in a manner that minimizes creation and dispersal of lead-contaminated dust and protects residents, especially children, from possible lead exposure.

- This course will show workers how to perform their job in a manner that creates the least amount of dust possible, and how to contain and clean up the dust that they do create so that it does not spread throughout the house or to neighboring properties.

- Lead-safe program managers will learn how to legally dispose of their lead waste and maintain documentation of program compliance.

- This course meets the legal requirements for basic and annual lead-hazard education. Successful completion will grant the student a "Notice of Completion" as required by HUD for the purpose of being trained on lead-hazard and, therefore, qualified to work on "low-risk" jobs. Real estate professionals may qualify for Continuing Education Units for attending these courses.

CHAPTER 1— Why Lead? Why Now the Concern?

Lead Recognized as Poison

Lead paint and our knowledge of lead poisoning goes back a long way. There is a famous letter by Ben Franklin discussing the dangers of lead. The workers in his print shop suffered from lead-related health problems. Occupational lead hazards to potters using lead glazes was first reported in 1713.

Lead uses increased during the industrial growth of the 1800s and so did related exposures. Workers most effected were printers, smelter workers, plumbers, glaziers, stone cutters, and soldiers.

Australian researchers were the first to diagnose lead paint poisoning in children. They published several papers explaining how other potential sources of lead had been eliminated in those cases – demonstrating that the source of the lead was definitely paint.

Example— Victorian Farmhouse, Poisoning of Family

This true story has been told many times and is documented in medical journals. The Marino Case is an example of how uncontrolled renovation work can cause lead poisoning in adults and children. The dwelling was a 2-story Victorian farmhouse. Most of the wooden floors, moldings, walls, ceilings, and door frames had been painted with lead-based paint. The renovation involved removing paint on many of the surfaces using rotary power sanders, hand sanders, scrapers, torches, heat guns, and chemical strippers. The family left the house during most of the work but returned before it was complete. There was dust throughout the home. After one of the family's dogs had seizures, the vet determined that the dog was lead-poisoned. The mother and two children were tested for lead-based paint and were found to have extremely high levels of lead in their blood. All three had to be admitted to the hospital to be treated for severe lead poisoning

Austria banned the use of white lead in domestic interiors around 1910. Soon after, a number of countries (mostly in Europe) ratified a ban on white lead paint. In the twenties, other countries (including Great Britain, Tunisia, and Cuba, among others) either banned the use of lead paint indoors or severely restricted children's contact with it. However, in the U.S., The National Paint, Oil, and Varnish Association opposed the ban and the U.S. never ratified the ban. Consequently, lead continued to be used in the U.S.

Lead=Poison!

through the 50s and 60s (although lead content in paint did decline).

Lead use in paint for residential housing was finally banned in the U.S. in 1978 by the Consumer Product Safety Commission**.**

Lead is most dangerous in the form of dust and fumes, which can't be seen or felt. Lead is taken into the body by breathing or by ingestion. For example, lead dust on a windowsill is transferred to the hand and then ingested when fingers, food, or cigarettes are placed into the mouth. Young children put their hands into their mouths frequently, so they are at a higher risk of being poisoned by lead.

Title X

"Title X" (Title Ten) is the name by which a section of the Housing and Community Development Act of 1992, called the Residential Lead-Based Paint Hazard Reduction Act of 1992 (PL 102-550, October 1992). Several of the general purposes of this law were to prevent lead poisoning, insure that Federal policies incorporate lead hazards reduction measures, educate the public and develop an infrastructure capable of dealing with lead in housing (e.g., trained and certified professionals such as lead abatement contractors). All lead regulations from federal agencies such as the Environmental Protection Agency (EPA), the Department of Housing and Urban Development (HUD), and the Occupational Safety and Health Administration (OSHA) were developed based on direction found in Title X. This document is the cornerstone of the national lead program.

To summarize, some of the key features of Title X are that it:

- Emphasizes the prevention of lead-based paint hazards ***before*** children are poisoned;
- Shifts focus away from abating (i.e., permanently removing) intact lead-based paint to controlling lead-based paint hazards and allows for new technology for evaluating and reducing those hazards;
- Redefines the concept of lead-based paint hazards to include lead-contaminated dust and soil;
- Acknowledges that some lead-based paint hazards are of more immediate concern than others;

- Recognizes that resources are limited and allows for the tailoring of lead-based paint hazard programs to fit the financial and environmental conditions of specific properties.

The presence of lead-based paint in a home is not automatically hazardous. Title X, defined lead-based paint hazards as any condition that causes enough exposure to lead to cause ill health. Since lead dust that is either breathed in or ingested is a health hazard, then a lead-based paint hazard exists wherever lead dust is present in levels that exceed the regulatory standards.

Six Situations Where Lead-Based Paint is a Hazard

Title X lists six situations where lead-based paint is a hazard:

- When it is damaged. Damaged/deteriorated paint creates dust. Lead dust particles cannot be seen or felt. Aging, water damage, humidity, and other environmental conditions can cause paint to deteriorate. Damage can also be caused by mechanical means such as accidents and renovation work.

- When lead-based paint is on a friction surface creating levels of lead dust that exceed regulatory standards. A friction surface is any surface that rubs against another. Floors and windows are friction surfaces.

- When lead-based paint is on an impact surface and is deteriorating. An impact surface is any surface that has forceful contact over and over again. Doors have impact surfaces. Friction and impact creates dust. The dust settles quickly and sticks to the surfaces it lands on. Friction and impact can come from many sources. Renovation, sanding, and scraping create friction and impact that can damage lead paint and create dust.

- When dust above the federally established standards is found. Lead dust is the primary source of exposure that leads to lead poisoning. Approximately 86 percent of lead poisoned children are poisoned by ingesting lead dust, NOT PAINT CHIPS!! (MD McElvaine, EG DeUngria, TD Matte, CG Copley, and S. Binder. "Prevalence of radiographic evidence of paint chip ingestion among children with

moderate to severe lead poisoning, St. Louis, MO, 1989-1990." Pediatrics 1992, 89:740-742.

- When it is on a "chewable" surface. There are many types of chewable surfaces within a typical residential structure. Examples of chewable surfaces include: windowsills, moldings, cabinet doors, support posts, shelves, etc.

- When there is contaminated soil above established standards. Lead in soil comes from many sources, such as gasoline, industrial releases, and paint. Lead deposited in the soil does not dissipate, degrade or decay. Lead in soil can contribute to lead dust in the home.

  The EPA recommends that exposure-reduction activities be undertaken when soil lead concentrations exceed 400 ppm at areas expected or intended to be used by children. If areas expected to be used by children have soil lead levels in excess of 5,000 ppm, the EPA recommends "abatement" of the soil. Abatement includes removal and replacement of the soil or covering with concrete or other permanent barrier. (Guidance on Identification of Lead-Based Paint Hazards. Vol. 60, No. 175, Part V, 60 FR 47248, Monday, September 11, 1995.)

Federal and State Agencies with Rules on Lead

Both the Federal and State governments have enacted many rules, regulations, and opinions concerning lead in residential property.

Federal Agencies

Title X requires federal agencies to establish rules about working with lead. These Federal agencies include:

- Occupational Safety and Health Administration (OSHA)
- Environmental Protection Agency (EPA)
- Department of Housing and Urban Development (HUD)
- Center for Disease Control and Prevention (CDC)

Occupational Safety and Health Administration (OSHA)

This agency - an agency of the Department of Labor - writes and enforces rules protecting workers on the job. Under Title X, OSHA developed standards about lead exposure on construction jobs. In response to this directive, The OSHA Lead in Construction Standard was developed. Many states have since adopted this standard as their own.

Environmental Protection Agency (EPA)

EPA is responsible for protecting human health and safeguarding the natural environment. Under the Toxic Substance Control Act (TSCA) of 1976 (Title 15, United States Code, Section 2601 et seq.), EPA regulates all chemicals imported or produced in the U.S. The regulations requires testing of commercial chemicals for toxic effects and regulates use and cleanup. Title IV of TSCA covers lead paint hazards and is enforced by EPA, sometimes in conjunction with other agencies such as U.S. Department of Housing and Urban Development (HUD). Cal/EPA enforces it in California. Also, the Federal Lead Contamination Control Act of 1988 (Title 42, United States Code, Section 300j-21), an amendment to the federal Safe Drinking Water Act of 1974, prohibits lead-lined water coolers in schools and childcare facilities, and requires the U.S. Environmental Protection Agency (EPA) to set up an information program to help local school districts identify and eliminate lead contamination in drinking water.

The Safe Drinking Water Act (1986 and 1988) made it illegal to use lead in residential plumbing. Until then, lead was used in pipes and solder, which, unfortunately leached into the drinking water. Likewise, lead-soldered cans were banned from human consumption.

Under Title X, EPA developed plans to train and certify people who work with lead. EPA was also required to define exactly what a lead paint hazard is and to study lead hazards associated with renovation, remodeling and maintenance activity.

Department of Housing and Urban Development (HUD)

This agency is responsible for mortgage insurance, housing assistance, housing rehabilitation programs, public housing, federally supported private housing, and Indian housing. HUD is responsible for operating the Lead Hazard Control Grant Program for privately owned low-income housing. Most pre-1978 properties receiving HUD funds are subject to HUD requirements for lead-based paint.

Under Title X, HUD was given the task to prepare guidelines for how people should work with lead and how buildings should be inspected for lead. HUD was also required to prepare regulations to require testing and control of

lead-based paint hazards in housing that is owned by or receives assistance from the government. Finally, Title X authorized HUD to administer a grant program to address lead paint hazards in low-income housing.

Centers for Disease Control and Prevention (CDC)

CDC is responsible for promoting health and quality of life by preventing and controlling disease, injury, and disability. This agency was entrusted with monitoring the blood lead levels in children.

California Agencies

Besides the federal agencies, there are California agencies involved in the regulation of lead. The two state agencies with the greatest involvement with lead regulations are the Department of Health Services and Cal/OSHA. Other agencies with lead regulations include Cal/EPA, and Air Quality Management Districts (AQMD). Often, their regulations mirror the federal regulations.

California Department of Health Services

Accreditation, Certification, and Work Practices for Lead-Based Paint and Lead Hazards

Title 17, California Code of Regulations, Section 35001 et. seq. is the key state regulation for lead work. Defines "lead hazard" as deteriorated lead-based paint, lead contaminated dust, lead contaminated soil, disturbing lead-based paint or presumed lead-based paint without containment, or any other nuisance which may result in persistent and quantifiable lead exposure.

Besides establishing requirements for the accreditation and training of certified lead workers and supervisors, it sets out requirements for all lead abatement work in public buildings and residential buildings. Defines "lead abatement" as any set of measures designed to reduce or eliminate lead hazards or lead-based paint in building; however, this does not include containment or cleaning. It should be noted that the usage of "abatement" by HUD does not coincide with OSHA (see Chapter 10). Section 35001 also requires state-certified workers and supervisors for abatement work that is

designed to reduce lead paint or other lead hazards for a minimum of 20 years. It requires other measures as well.

For abatement designed to reduce lead paint hazards for less than 20 years, Title 17 has a list of requirements including specific work procedures that follow Chapter 11, Interim Controls, of the U.S. Housing and Urban Development (HUD) *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*, June 1995.

Cal/OSHA

Lead in Construction Standard

In November 1993, the State of California OSHA (Cal/OSHA) adopted the Federal OSHA standard into Title 8, California Code of Regulations, Section 1532.1, Construction Safety Order. It requires safe practices in all construction and maintenance work where employees may be exposed to lead. Activities covered include alterations, repair, and even painting of buildings.

Sets requirement related to permissible level of worker exposure, exposure assessment, work practices, personal protective equipment including respirators, medical surveillance programs (including blood testing), housekeeping, hygiene facilities and practices, signs, and record keeping.

Also defines a set of "trigger tasks" which are assumed to incur lead exposure over the legal limit and require respiratory and other protection until an actual exposure assessment is done. Also sets out requirements for "medical removal protection," where an employee is removed from lead work and given alternative work, or paid leave and benefits, until medically released for return to lead work.

Injury and Illness Prevention Program Standard

(Title 8, California Code of Regulations, Sections 1509 and 3203) Requires California employers to have a written program that outlines how they plan to assess hazards, correct them, and communicate information to workers. The Injury and Illness Prevention Program (IIPP) must cover hazards at each specific worksite, including lead.

Hazard Communication Standard

(Title 8, California Code of Regulations, Section 5194) Requires California employers to inform workers about the hazards that may be present in the workplace, including lead. Requires employers to keep Material Safety Data Sheets (MSDSs) on hazardous substances and make them available to workers. Also, employers must provide training about work hazards, safe work practices, and protective measures.

Summary of Regulatory Agencies

There are a number of federal and state programs affecting renovation, remodeling, and rehabilitation of residential property when lead is involved. The basic requirements are:

- OSHA (and Cal/OSHA): Worker protection standards for lead in construction
- EPA: Contractors distribute lead pamphlet before renovation
- HUD: Grants for Lead Hazard Control in private low-income housing; Lead Safe Housing Rule for Federally owned or assisted housing
- HUD and EPA: Disclosure before lease or sale
- CDC: Testing children's blood.

Continuing Regulations on Lead-Based Paint

As explained, many government agencies were mandated under Title X to develop rules and regulations to help protect workers and residents from the hazards of lead-based paint. Each year, OSHA, EPA, HUD, and others issue new regulations and interpretations of older regulations. For example, in September 15, 1999, HUD finalized sections 1012 and 1013 of Title X specifying requirements for "evaluation and reduction of lead-based paint hazards in Federally assisted housing," and "disposition of Federally owned housing." These new requirements took effect on September 15, 2000. HUD estimates that about 2.8 million housing units will be affected by this regulation during the first five years. These new requirements are discussed later.

Because of the continuing changes in regulations related to lead-based paint, both Cal/OSHA and HUD mandate **annual** training or refresher education. (See requirements later on worker training.)

LEAD

The trap is set.

BASED

Don't get caught.

PAINT:

BY GEORGE SHRIVER GOODHUES

Article— The Impact of Lead Regulations on Real Estate Practices.

Once the dust settled and you had a chance to look at them, the answers to Title X Section 1018 disclosure requirements sure seemed simple. Instead of doing hours of research or spending thousands on testing, you just check the box saying "I don't know and I have no testing" on the forms you were required to give residents. One little checkmark. Problem solved.

Not so fast. Think the U.S. Environmental Protection Agency (EPA) and Department of Justice (DOJ) would never formulate an enforcement strategy that would allow them to collect millions in administrative penalties from property owners and managers who checked that little box? Think again.

According to a recent story in U.S. Newswire via NewsEdge Corporation:

> *Attorney General Janet Reno and Housing Secretary Andrew Cuomo today announced multiple court actions of over $1 million against landlords who violated federal law by failing to warn their tenants that their homes may contain lead-based paint hazards.*
>
> *These actions, the first ever filed under the Residential Lead-Based Paint Hazard Reduction Act, include four settlements totaling more than $1 million worth of lead paint abatement and $259,000, in fines and other commitments. In addition, HUD has undertaken 45 administrative enforcement actions under the act in 20 cities.*
>
> *Together, these cases signal the Administration's stepped up efforts to protect children and others who are vulnerable to suffering from exposure to lead-based paint. The nationwide enforcement effort involves the cooperation of DOJ, HUD and Environmental Protection Agency, and*

state and local governments around the country.

In conjunction with today's announcement, HUD will begin working with federal and local officials in all 50 states to bring cases against landlords who fail to comply with the law. In the next couple of weeks the, DOJ will also be sharing with U.S. Attorney's offices across the country a packet of information on how to investigate and prosecute similar cases.

The judgements were reached against property owners and managers who, in all likelihood, thought they were complying with the law by checking the box that denied any knowledge of lead-based paint on their properties. Like thousands of other owners and managers, they probably didn't see a need to test for the paint, and had no on-site paperwork identifying any known hazards. They fell right into the trap.

Routine Properties, Big Judgements

To demonstrate how easily these penalties can be assessed, imagine a generic property containing 250 garden style apartments, a pool and community clubhouse, a maintenance shop, and associated common areas. This property was constructed in two phases, one in 1942 and the second in 1963. As with most properties showing their age, improvements were made from time to time. Overall the property is well maintained and 95 percent occupied with a relatively low turnover rate of 40 percent. Pretty typical.

One sunny Wednesday afternoon, an EPA/ DOJ auditor walks into the rental office, presents the proper identification and asks to review the owner's disclosure record under Title X Section 1018. He finds the records in meticulous order and sees that they indicate "no knowledge, no testing"—so far, perfectly legal. The auditor then asks to see all available documents relating to the most recent financing on the property. The information is not kept on site but is forwarded to the inspector by the home office.

Know About TSCA

Effective June 1, 1999 the Toxic Substances and Control Act (T.S.C.A.) Section 406 (b) went into law. This requires that notification be given every time a painted surface of more than two square feet is disturbed on a residential property built before 1978. It requires the disclosure of information about the repair activity and the provision of the EPA pamphlet "Protect Your Family from Lead in Your Home," undertaken in an occupied unit. Notification requirements also apply to work performed in common areas.

If you do not have a report by a state certified inspector that determines that the surface in question does not contain lead-based paint, any repairs involving more than two square feet of that surface are subject to the disclosure rule. This rule can be found in the June 1, 1999 Federal Register or on the Internet at www.epa.gov/lead/eadrenflhtm.

Notification for occupied units may only require that before renovating, your maintenance staff distribute the EPA pamphlet to an adult resident, which must return a signed acknowledgement. In the event that a resident refuses to sign the acknowledgement or is not available to sign, the pamphlet may be left in the apartment, and your maintenance staff may sign a different acknowledgement.

The rule provides that disclosure must occur prior to the renovation, but no more than 60 days in advance.

If a signed acknowledgement from the owner cannot be obtained, the renovator shall mail to the owner the EPA pamphlet at least seven days prior to renovation.

The signed acknowledgement must be maintained by the renovator for three years following the completion of the repair. In the

One of the documents forwarded is a Phase I Environmental Site Assessment that includes "cursory" lead-based paint information. Positive or negative, done properly or improperly, it doesn't matter. This owner is guilty of a violation under Section 1018 (b)(5) of Title X. Trapped.

The penalties, unfortunately, are quite harsh. From September 6, 1996 to September 6, 1999, the property experienced 40 percent turnover in its 250 units, which equals 100 disclosable events per year or 400 violations. Each violation can cost up to $11,000. Already, the property owner owes the government $4.4 million, assuming that there were no rent increases during the year in question.

That's just the start: assume that the inspector asks to see the property's maintenance records since June 1, 1999. This would be to confirm compliance with the Toxic Substances and Control Act (TSCA) Section 406(b), which requires notification every time more than two square feet of painted surface is disturbed. (See sidebar)

In anticipation for the summer season, the property's maintenance staff performed routine annual pool preservation activities in July 1999. As always, these activities included re-painting the combination restrooms and changing areas, the perimeter fence, and the safety markings. Before they could paint, the crew had to sand, chip, and grind these surfaces—again all routine practices. The property owner had never even heard of Section 406 (b) and therefore did not provide information on these activities to the residents.

Because this work involved a common area, the property owner could face another 238 violations (one for each occupied apartment) at $11,000 apiece, which brings his total to $5.9 million.

At this point, any inspector worth his salt would inquire about other properties in the owner's portfolio. Intuition would indicate that what the inspector found at the first property would be repeated on other properties.

We've already established that this property is fairly typical in many markets –an older property that's been renovated a few times. The owner in this situation thought that he was complying with the law when he checked that box. As we've seen, a little research could have saved him a lot of heartache, time, and money.

Small Renovations Count

Section 406 (b) focuses largely on renovation, which may lead owners to believe that it does not apply to them.

EPA, however, has defined renovation as including activities that "disturb" more than two square feet of a painted surface. This is not a big area—most property owners are discovering that the rule covers a significant portion of their routine repair and maintenance activities. Some property owners have commented that this seems to be an administrative burden that will fall only on the contractors. Don't be fooled. All maintenance and repair activities conducted by outside contractors or inside staff are covered by the rule if the work involves more than two square feet of a painted surface. In some jurisdictions, this may require anyone disturbing more than two square feet of a painted surface to be trained in accordance with state and local rules and regulations.

Coming into Compliance

Besides developing a strategy to ensure that you're in complete compliance with the federal rules covering lead-based paint, you must also consider all applicable state and local regulations.

The first step towards compliance is to define your goals. Is your intention to become compliant with lead-based paint rules and regulations? Do you just want to avoid the administrative penalty provisions as outlined above? Should you take steps to avoid litigation originated by residents and the plaintiff's bar?

Unless you have the time and the inclination to become your own lead expert, seek appropriate consultation. A complete audit of your portfolio holdings and current practices may save thousands of dollars in testing costs.

Once you have reviewed audit results and historical findings, a state-certified consultant or testing firm can design a strategy to provide proper notification under 406 (b) and correct the deficiencies in your Section 1018 disclosure forms. Based on the preliminary findings, a budget can be devised to replace building components such as molding that contain lead-based paint and you can get on the right track towards legitimate lead-free status.

Based on the pattern of inclusion of lead in house paint over the years, interior readings on properties built between 1960 and 1978 would likely yield no or limited lead-based paint results. Having concrete proof—which means testing by a state-certified inspector—that these components are lead-free would remove the necessity to notify residents under Section 406(b). After removing or replacing leaded components, a full HUD Chapter 7 protocol testing regime can be employed and free you from lead-based paint concerns permanently.

Older properties that have an increased likelihood of containing lead-based paint throughout the property must be tested in accordance with HUD Chapter 7 guidelines. In properties constructed before 1960, the number of units required to form conclusions is significantly higher. On the typical 250-unit property, HUD Chapter 7 would require complete testing of 52 apartments, exteriors, and associated common areas, and would cost around $9,000.

To date, most property owners and managers have not seen the benefits of spending thousands of dollars on these tests. Until June 1, 1999, this was probably a sound business decision. Unfortunately, your exposure to liability today is multifaceted and the requirements have become extremely complex. This is the time to come into compliance. To ignore the problem is to flirt with disaster and risk getting trapped.

Connor is President of CONNOR Environmental Services & Engineering Assessments, Baltimore. Goodhues is also employed by CONNOR Environmental Services.

Key Facts

Lead Recognized as Poison

- Ben Franklin letter discussed dangers.
- Austria banned use in interior paint in 1910.
- Lead paint for residential housing banned in U.S. in 1978.

Title X

- Section of Housing and Community Development Act of 1992 called the Residential Lead-Based Paint Hazard Reduction Act of 1992 (PL 102-550, October 1992).
- Directed EPA, OSHA, HUD and others to develop regulations.
- Lead-based paint in a home is not automatically hazardous.
- Lead dust that can be breathed in or ingested is the health hazard.

Six Situations Where Lead-Based Paint is a Hazard

- When it is damaged.
- When lead-based paint is on a friction surface creating lead dust.
- When lead-based paint is on an impact surface and is deteriorating.
- When dust above the federally established standards is found.
- When it is on a "chewable" surface.
- When there is contaminated soil.

Agencies With Rules on Lead

- Occupational Safety and Health Administration (OSHA)
- Environmental Protection Agency (EPA)
- Department of Housing and Urban Development (HUD)
- Center for Disease Control and Prevention (CDC)
- California Department of Health Services
- Cal/OSHA

Article explains that checking off "I don't know and I have no testing" to the question of lead in residential rental property covered by Title X Section 1018, often does not provide protection. Although it should relieve owners from having to inform tenants of the presence of lead, often there are other reports— such as bank records, environmental studies— that contain reference to the presence of lead on the property. Owners have the responsibility to inform residents of these other reports. Failing to do so can result in a maximum of $11,000 per incident fine.

Likewise, every time two square feet of painted surface is disturbed, maintenance records must show residents were notified, workers used appropriate lead-safe techniques, and more. Each violation could result in $11,000 additional fines.

CHAPTER 2— What is Lead?

Lead is a heavy, durable, soft, gray metal chemical element. It can be pressed or hammered into various shapes without breaking. The chemical symbol for lead is Pb, which comes from the Latin word "Plumbum." It has no characteristic taste or smell. Metallic lead does not dissolve in water and does not burn. Some natural and man-made substances contain lead but do not look like lead in its metallic form. Some of these substances can burn.

Lead dust will completely settle out of the air in about an hour. Over time, lead does not break down or decay. Lead is a dangerous poison. It is most dangerous in the form of dust and fumes, which can't be seen or felt. Lead is taken into the body by breathing or by ingestion. For example, lead dust on a windowsill is transferred to the hand and then ingested when fingers, food, or cigarettes are placed into the mouth. Young children put their hands into their mouths frequently, so they are at a higher risk of being poisoned by lead.

History of Lead

6500 B.C., TURKEY:
The oldest known lead object was discovered in Turkey.

3000 B.C., EGYPT:
Lead was mined, refined, and used for sculpting, often as a substitute for bronze. It was used as lead in solder, cosmetics, and building materials. It was also used as a pigment and binder in paints. They knew that lead could kill people if they swallowed too much.

200 B.C., GREECE:
The Ancient Greeks used lead for sculpting. Greek Physician Nicander, was the first person to document the "tortures" of lead poisoning: foaming lips, bloated belly, drooping limbs, and enflamed mouth.

ANCIENT ROME
The Romans were the first to use lead for industrial purposes. They used lead pipes for the water supply system. Lead was also used to line goblets, added to pottery glazes, and even as an additive in wine. The Romans were aware of lead poisoning, but continued to use it.

THE MIDDLE AGES, EUROPE
Lead was used by craftsmen, painters, and for industrial purposes (pipes, roof waterproofing membrane). Doctors realized that the health problems of painters, miners, and artists were caused by exposure to lead.

EUROPE
Throughout Europe, it was widely known that exposure to lead caused serious health problems. In the 1400's, France and Spain prohibited adding lead to wine. "Lead-Free" paints were made available to the public by the 1800's.

UNITED STATES, 1900's
Use of lead paint was being promoted in advertisements. Many doctors studied and wrote articles about lead poisoning and found that lead paint caused reproductive problems for workers and their families. In 1913, Dr. Alice Hamilton documented the occurrence of "wrist and foot drop" among immigrant workers in Chicago. MMWR June 11, 1999 / 48(22); 462.

Where is Lead Found?

Workers in over 120 different occupations are exposed to lead. Processes that may involve exposure to lead include:

Manufacturing:

- Electric storage batteries
- Paint, inks, dyes
- Ceramics, glazes, tile, stained glass
- Glass, crystal, optical
- Cable and wire
- Rubber
- Plastics
- Automobiles
- Explosives
- Metal cans
- Solder

Fabrication:
(with lead-containing metals like brass, bronze, lead alloys):

- Casting, die-casting

Rolling and drawing
Machining
Grinding
Repair and Assembly:
Lead soldering (repair work, electronics industry)
Radiator repair
Auto body repair
Welding, cutting, sanding, grinding of lead alloys or lead-coated surfaces
Shipbuilding and repair

Construction:
Painting*
Paint removal (sanding, abrasive blasting, scraping, torching, stripping, heat gun applications)*
Plumbing work
Demolition
Welding or cutting materials with lead-coated surfaces or lead alloys
Remodeling/renovation

Other:
Smelting
Foundry operations
Shooting firearms
Recycling/reprocessing lead-containing materials

* Many people incorrectly believe that lead in paint is no longer a problem. In 1978, the Consumer Product Safety Commission severely limited the lead content in paint used for residences or on toys. However, painted surfaces frequently contain significant quantities of lead. Lead pigments are still used in some paint applications, often to prevent corrosion on metal surfaces.

Lead-Based paint and Its Regulation

Lead was used in paints for several reasons. Lead made colors more vibrant, it made the paint more durable, it resisted the growth of mold and mildew, and helped prevent corrosion of metal surfaces. Lead was also added to paint to make them dry faster. Dutch Boy advertised its

LEAD-BASED PAINT AD
Dutch Boy ad from Oil, Paint and Drug Reporter Magazine, 12/6/37

product to be so fine that it would sink into every joint and pore, and that it would keep wood thoroughly and perfectly covered for years.

Lead paint can be found in homes, schools, and other buildings. It can be found on furniture, toys, playground equipment, cars, boats, and many other items. Lead paint is also used by industries on towers, tanks, bridges, ships, and warehouses. Lead can also be found in primers used on metal building components.

Any home built before 1978 may contain lead-based paint. Lead paint can be found on any painted surface; inside or outside. It can be found on woodwork, walls, floors, and stairs. Due to its resistance to mold and mildew, lead paint was often used in places where moisture is found, like kitchens, bathrooms, windows, and doors. Exterior paints often contained twice as much lead as interior paint. And, paints contained as much as 50% lead in the 1950s. After 1950, paint manufacturers began to voluntarily (because of threats from government regulation) reduce the amount of lead they put into their consumer paints. Consequently, painted surfaces in homes built before 1950 are likely to have higher levels of lead.

Any activity involving surface preparation, such as hand scraping, power sanding, the use of heat guns, and open flame burning, can generate significant amounts of dust. More complicated tasks such as removing building components and demolishing walls also can create a lot of dust. A worker's family may be most at risk from being exposed to lead-contaminated dust because dust can be tracked home and into vehicles on the worker's clothing and shoes.

House Paint

In 1978, the Consumer Product Safety Commission (CPSC) banned the use of lead paint on:

- Residences
- Hospitals
- Playgrounds
- Schools
- Parks
- Public buildings where consumers have access to the painted surface

The ban was not absolute. The ban limited residential paint to not more than 600 ppm lead. Most latex paints never contained lead; however, non-residential paint, such as some industrial paints and marine paints used for boats, can still be lead-based. And although the CPSC ban occurred in 1978, supplies on hand extended the use of residential lead-based paint into the 1980s. DHS studies have found that trim components such as window sashes, door jambs, and baseboards usually have significantly more lead than wall paint— up to five times as much for trim on exterior walls, and twice as much for trim on interior walls.

The following items were not listed in the original CPSC ban:

- Paint for agricultural and industrial equipment
- Graphic art paints (used on billboards, road signs, etc.) and Artist Paints
- Items whose lead hazard was not due to lead paint (mini-blinds, crayons, jewelry, and figurines used for game pieces.
- Metal furniture bearing factory-applied coatings.
- Industrial and commercial paints (ex: traffic marking paint)
- Touch-up paint for agricultural equipment, lawn & garden equipment and appliances
- Mirrors (lead-containing backing paint)
- Catalyzed coatings on radio-controlled model airplanes

In addition, the CPSC also banned the use of lead paint on certain consumer products:

- Toys
- Consumer-use furniture
- Items used in schools
- Items used by children
- Household items
- Recreational items

16 CFR Part 1303.1 (a&b)

Industrial Paint

Lead-based paint is still allowed for industrial uses today. It is used in shipbuilding, and on bridges and steel structures to prevent rust and corrosion. Presently, and historically, blasting and grinding of lead-based paint on steel structures is responsible for the creation of huge amounts of

lead dust. The dust gets into the air, nearby soils, plants, and water, putting workers and community residents at risk for exposure to lead.

Houses Built After 1978

Houses built after 1978 may contain lead from the use of old paint or other sources. For example, some people believe bathrooms need special marine paint to withstand the moisture. Thus, they buy and use lead-bearing marine paint in their bathrooms. Such a belief is false and only contaminates a house that otherwise would not have lead-based paint hazard.

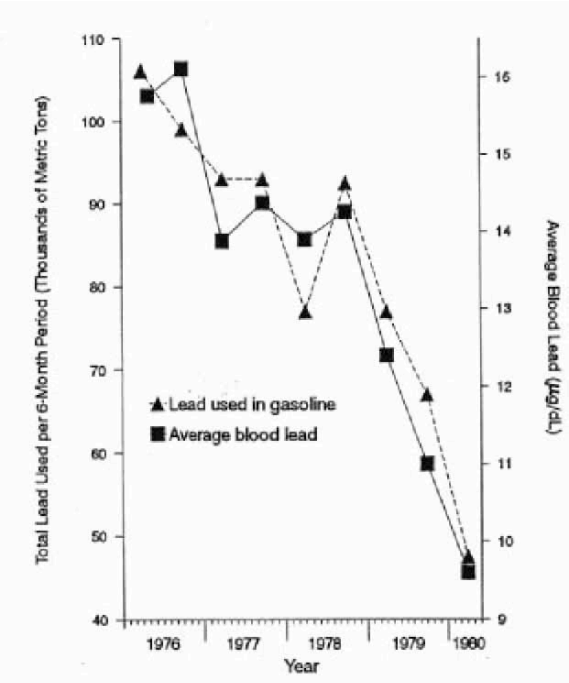


FIGURE 1-3 Lead used in gasoline production and average NHANES II blood lead (Feb. 1976-Feb. 1980). Source: Annest, 1983.

Other Sources of Lead Exposure and Its Regulation

Industrial Releases

Industries use lead for a variety of processes and products. Lead is used to make batteries, ceramics, lead crystal, bullets, and some plastics. The use of these products can pollute soil, water, and air, and may contribute to human ingestion of lead.

Lead in Air

Lead in the air comes mainly from the use of lead additives in fuel, from industrial processes, and from industrial uses of lead paint. In the past, lead was added to gasoline as an antiknock agent. As the gasoline burned, the lead was released into the air through the car exhaust. The lead would then settle out of the air, polluting nearby soils and water. In 1973, The Environmental Protection Agency (EPA) issued regulations that gradually reduced the amount of lead added to gasoline. By the mid-1990's, the U.S. national average level of lead found in children's blood had dropped by 80% (NHANES III, Update: Blood Lead Levels in United States 1991-1994. *Morbidity and Mortality Weekly Report*, February 21, 1997). Leaded

gasoline is still available for use in farm equipment and in other countries like Mexico and England.

The other source of lead in the air is from industrial process sites, such as foundries, smelters, and battery manufacturing. Uncontained blasting of lead paint off steel structures creates huge amounts of lead dust. Workers and the community surrounding the site may be exposed to this lead dust. The lead dust gets into the air and nearby soil, plants, and water.

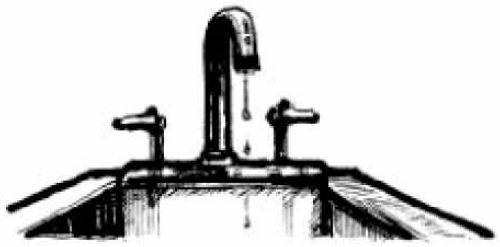
Lead in Soil and Dust

Traces of lead can be found in most soils. Lead in soil and dust comes primarily from flaking lead paint on houses, air pollution from gas exhaust, and industrial emissions. The legacy from using leaded gasoline is that some areas (especially adjacent to highways) have high concentrations of lead in the soil. Although lead emissions from gasoline have been virtually eliminated, an estimated 4 - 5 million metric tons of lead used in gasoline remain in dust and soil. (Agency for Toxic Substances and Disease Registry. *The nature and extent of lead poisoning in children in the United States: a report to Congress*. Atlanta: ATSDR, 1988.)

Household dust can be contaminated through oxidation of intact lead paint. Exterior lead paints were designed to "chalk" -lose some of the surface paint due to rain and ultraviolet light, in order to keep the surface looking fresh. The lead pigment that washed off in this process accumulated in the soil around the house.

Another source of lead in soil occurs when a contractor is preparing the exterior surface and the lead paint chips and dust fall to the ground. Some playgrounds and houses have soil that contains high levels of lead. Such areas can be very dangerous to children. Children get dirt on their hands that have lead in it and then put their hands in their mouths.

Since lead does not dissipate, degrade, or decay, the lead in soil becomes a long-term source of lead exposure.



Lead in Water

Lead was used in pipes and solder up until the mid-1980s. Lead from the plumbing would leach into the drinking water. The Safe Drinking Water Act (1986 and 1988) made it illegal to use lead in residential plumbing. Although lead pipes are rare in California and are not permitted in new construction, some old pipe service laterals do exist. It is now illegal to use lead-containing materials in drinking water plumbing.

Lead in Food

Food grown in lead-contaminated soil (especially root vegetables) can also contain lead. Another source is food packed in cans that contain lead solder. Lead solder has been used to hold cans together. As of November 1991, lead-soldered cans were no longer allowed to be produced in the United States. Lead-free cans have no seams, or a smooth, vertical seam. But lead-soldered cans are permitted in some countries that export food to the United States. The Food and Drug Administration has proposed a law that would stop any cans with lead solder from coming into this country.

Lead in Hobbies

Many people are exposed to lead in work they do around their house or in their hobbies. Examples include:

Making pottery/ceramics using glazes
Firearms target practice/loading ammunition
Making stained glass
Making fishing weights
Casting bullets, shot, or other objects
Soldering, brazing, or tinning
Car and boat repair
Painting- some art paints have lead pigments

Refinishing furniture
Home remodeling

Lead in Glazed Pottery

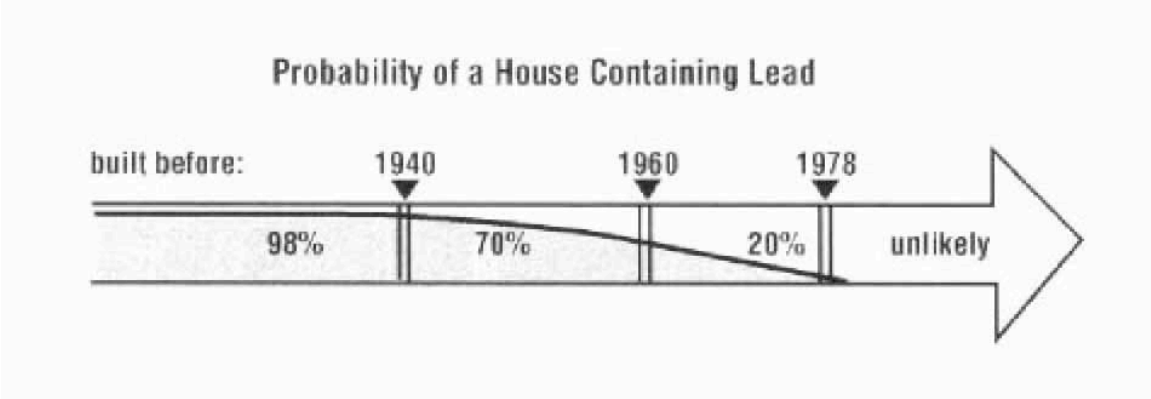
Lead-glazed pottery can release lead into food and drink and cause lead poisoning. Ceramic dishware sold in the United States today may be coated with a glaze that contains lead (though this is now less common). If the glaze is chipped or improperly fired, substantial levels of lead can leach into the food. Acidic foods, such as tomatoes, are especially efficient in leaching lead from improperly fired glazes. Since 1971, the FDA has set limits on the amount of lead that can leach from dishware in a standard 24-hour test. The FDA acknowledges that many pieces of ceramic ware do not meet the current standards. Especially suspect are products imported from areas such as Mexico, Asia, and Italy, where production standards may be low or enforcement of regulations lax.

Lead in Folk Remedies

In the last decade, several folk remedies and cosmetics originating from foreign countries have been identified as sources of lead poisoning in the United States. Two of these, Azarcon and *Greta,* are Mexican folk remedies use to treat "empacho," an illness with various gastrointestinal symptoms. Azarcon and Greta are also known as Liga Maria Lutsa *Alarcon,* Coral, and Rueda. Cases of lead poisoning traced to these folk remedies in California have been largely confined to Mexican culture. *Pay-loo-ah,* an Asian folk medicine for treating fever, has caused lead poisoning among Hmong refugee children from Laos. *Ghasard,* Bait Goli, and *Kandu* are other Asian folk remedies that are reported to contain lead.

The Lead Poisoning Problem in the U.S.

Today, the government estimates that 64 million U.S. homes contain lead-based paint. HUD estimates that 90 percent of the privately owned dwelling



units built before 1940 contain some lead-based paint. As a general rule of thumb, the older the dwelling, the more likely it is to contain lead-based paint. When working in pre-1978 housing, never assume that a surface does not have lead-based paint on it, unless it has been tested. If you do not know, you must assume that it does. LEAD POISONING AFFECTS YOU! The work that you do can create lead hazards. Lead can poison you and the people that live in the homes you work in. You can prevent lead poisoning by working with lead-based paint safely.

The National Health and Nutrition Examination survey (NHANES III) reported a decrease in the number of children with blood lead levels at or above 10 μg/dl (the CDC level of concern) from 1.7 million in 1988 to 890,000 in 1994. The same study also showed that minority children, low-income children, and children living in older housing (often deteriorating) have a greater chance of having elevated blood lead levels. This does not mean that lead poisoning is not a potential risk for higher income, non-minority populations. Anyone can be at risk.

The overall decrease in the number of cases of elevated blood lead levels, is the result of scientific research, increased awareness, and legislation that has mandated a reduction in the use of lead in gasoline and consumer products. Although much progress has been made, many people remain at risk for being lead-poisoned. A continuous reduction in the number of lead-poisoning cases will depend heavily on increased awareness and a change in work practices.

Key Facts

Lead

- Heavy, durable, soft, gray metal chemical element.
- Symbol for lead is Pb.
- Has no characteristic taste or smell.
- Metallic lead does not dissolve in water and does not burn.
- Lead dust will completely settle out of the air in about an hour.
- Lead dust tends to collect on flat surfaces like floors and on window sills and toughs.
- Lead does not break down or decay over time.

Uses of Lead

- Known in Turkey 6500 BC.
- Egypt, Greece, Ancient Rome, and other ancient cultures used lead for pipes, ceramics, paints, cosmetics, wine additive. They knew too much lead could kill.

Dangers of Lead

- Lead is a dangerous poison.
- It is most dangerous in the form of dust and fumes.
- Lead is taken into the body by breathing or by ingestion.
- The dangers of lead have been known for thousands of years.
- Dr. Alice Hamilton documented the occurrence of "wrist and foot drop" among lead workers in Chicago (1913).
- Lead dust is the primary source of lead poisoning in children, not eating paint chips.

Sources of Lead

- Manufacturing (batteries, paint, inks, ceramics, glass, rubber, plastics, metal cans, automobiles, explosives, etc.)
- Fabrication (grinding, die-casting, radiator repair, etc.)
- Construction (painting, plumbing, renovation, etc.)
- Recreation (shooting firearms, stain glass crafts, etc.)

Paint

- Contained as much as 50% by weight in the 1950s.
- Helped paint flow better and dry faster, was mildew resistant, enhanced color, and made paints last longer.

- Was banned in 1978 for use in: Residences, hospitals, playgrounds, schools, parks, and public buildings.
- Ban was not absolute. Instead limited residential paint to not more than 600 ppm lead.
- Most latex paints never contained lead.
- Some industrial and marine paints still use lead.
- DHS found trim components such as window sashes, door jambs, and baseboards usually have significantly more lead than wall paint— up to five times as much.
- Exterior lead paints were designed to "chalk" —lose some of the surface paint due to rain and ultraviolet light, in order to keep the surface looking fresh. The lead pigment that washes off in this process accumulates in the soil around the house.

Reasons Residential Property Built After 1978 May Contain Lead-Based Paint:

- Many people use up old paint before buying new paint.
- Special application. Some people use marine paint in the bathroom and other rooms of their house in the mistaken belief they are necessary for high moisture application.

Other Sources of Lead Exposure

- Industrial release while used in the manufacturing of batteries, ceramics, lead crystal, bullets, plastics, and others.
- Lead additive to gasoline was phased out in the 1970s. It contributed to lead in the air, and now has settled into soils and water and into the food chain.
- When a contractor is preparing the exterior surface and the lead paint chips and dust fall to the ground.
- Lead was used in pipes and solder up until the mid-1980s. Lead from the plumbing would leach into the drinking water. The Safe Drinking Water Act (1986 and 1988) made it illegal to use lead in residential plumbing.
- Lead-soldered cans were a source of lead (used along the seam) until 1991. However, some imported cans still use lead.
- Hobbies such as making pottery, stained glass, bullets, fishing weights, etc.
- Acidic foods such as tomatoes are especially efficient in leaching lead from some pottery and ceramic glazes.

- Some folk remedies contain large amounts of lead. Azarcon and *Greta,* are Mexican folk remedies use to treat "empacho," an illness with various gastrointestinal symptoms. Azarcon and Greta are also known as Liga Maria Lutsa *Alarcon,* Coral, and Rueda. Cases of lead poisoning traced to these folk remedies in California have been largely confined to Mexican culture. *Pay-loo-ah,* an Asian folk medicine for treating fever, has caused lead poisoning among Hmong refugee children from Laos. *Ghasard,* Bait Goli, and *Kandu* are other Asian folk remedies that are reported to contain lead.

Extent of Lead Poisoning In U.S.

- Lead dust is the main source of exposure that leads to lead poisoning.
- It is estimated that 890,000 children in 1994 had elevated blood lead levels.
- HUD estimates 64 million U.S. homes contain lead-based paint.
- 90 % of the privately owned dwelling units built before 1940 contain some lead-based paint.
- Older, deteriorating homes pose significant health threats to low-income families.

CHAPTER 3— Lead Health Effects

Lead Poisoning

Lead poisoning is a general term that refers to the health effects associated with an abnormally high level of lead in the bloodstream. In Wisconsin, lead poisoning is more specifically defined as "a level of lead in the blood of 10 or more micrograms per deciliter of blood." Symptoms of lead poisoning may develop quickly, but are often not seen until severe damage has been done. The health effects of lead poisoning are often difficult to recognize. The signs and symptoms of lead poisoning are often mistaken for a cold or the flu. The following is a list of the signs and symptoms of lead poisoning:

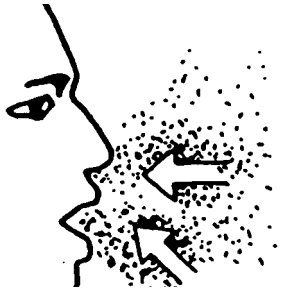
- Tiredness
- Sleep problems
- Dizziness
- Irritability
- Nervousness
- Headaches
- Difficulty concentrating
- Depression
- Forgetfulness
- Hyperactivity
- Problems having healthy children
- Wrist or foot drop
- Weakness
- Clumsiness
- Joint and muscle pain
- Vomiting
- Loss of appetite
- Stomach aches
- Constipation
- Metallic taste in mouth
- Numbness

Sometimes the signs of lead poisoning come and go. This can continue for several months. For this reason, a person may not realize that they are lead poisoned. It is important to understand that lead can cause damage, even if an individual does not have symptoms. A child with lead poisoning may seem healthy while damage is being done within his or her body. Obvious signs and symptoms often

do not develop until the condition is serious.

How Does Lead Get Into the Body?

There are only two ways that lead can get into the body, it is either breathed in or swallowed. It cannot be absorbed through the skin.



Breathing Lead— When lead is in the air, the tiny particles can be breathed into your lungs. The particles are quickly absorbed into the bloodstream.

Swallowing Lead— It may also be present in the form of dust or fumes. The heaviness of lead causes it to settle out of the air quickly. Lead dust will completely settle out of the air in about an hour. Over time, lead does not break down or decay.

Lead particles can be swallowed if a person eats, drinks, smokes, or places fingers into their mouth, without washing their hands, after coming into contact with lead dust. The particles of lead go through the digestive system and are slowly absorbed into the blood. Lead ingestion that occurs when hands or fingers are placed into the mouth is called "hand-to-mouth." Lead ingestion that occurs as a result of eating, drinking, or smoking is called "transfer."

Acute exposure occurs when someone is exposed to a lot of lead over a short time period. Acute exposure impedes the normal functioning of the brain and can lead to seizures, coma, and even death.

Chronic exposure occurs when someone is exposed to small amounts of lead over a period of time. Chronic exposure is more common than acute exposure and difficult to identify. Note: A good source of information on lead's toxicity is an article entitled "Health Effects of Lead on the Human Body" in *Lead Perspectives*, November/December 1996.

Pregnant Women are at High-risk

When a woman is exposed to lead during her pregnancy, it can effect fetal development and result in premature labor, still births, and developmental

delays in the fetus and in the child after birth. Women who are exposed to lead store it in their bones. This lead can be released into the blood during pregnancy. This means that a woman who was exposed to lead prior to her pregnancy may still place a future fetus at risk. Renovating and remodeling activities conducted by a pregnant woman or in a pregnant woman's home can put the fetus at risk, which includes:

- Miscarriages
- Premature births
- Low birth weight

Lead Within the Body

The Heart and Blood: Lead attaches to red blood cells in the area where iron and oxygen typically are. The result is that the blood cannot carry oxygen. Lead damages red blood cells, causing them to die sooner than they normally would. Lead also reduces your ability to make new blood cells. Anemia occurs when there is not enough iron or red blood cells. Anemia makes a person feel tired. Lead poisoning also may cause high blood pressure, which in turn increases the risk of heart attack, stroke, and kidney disease.

The Skeletal System: Lead is deposited in the bone tissue. In the bones, it blocks the production of new blood cells. Lead competes with calcium in the bones. If lead is in the bones instead of calcium, it can be re-released into our blood when the body needs calcium. The bones and teeth store 95% of the lead in the body. When a person is under stress, (sick, overactive, pregnant, under pressure) the lead is released from the bone and re-enters the blood. Once the lead returns to the blood, it causes problems all over again. Lead that stays in the body is called, "body burden."

The Male Reproductive System: Lead is very dangerous to the male reproductive system. Not only does lead have an affect on the male, but also it is known that the wives of lead-poisoned workers have more miscarriages and premature births, and that their children have more birth defects. The direct affects of lead on the male reproductive system are decreased sex drive, erectile dysfunction, infertility, and damaged sperm.

The Nervous System: The nervous system is most affected by lead. The nervous system includes the brain, spinal cord, and nerves. Damage to this

system can be permanent. Lead damages the brain and may kill brain cells. The result can be depression, irritability, forgetfulness, clumsiness, and loss of intelligence. At very high doses, lead can cause hallucinations, swelling of the brain, coma, and death. Lead damage to nerves usually starts at the hands and feet. The hands and feet may shake, or, in severe cases, they may be paralyzed. The nervous system of a fetus, infant, or child is affected by even small amounts of lead.

The Kidneys: The kidneys filter out some of the lead in the blood. Once filtered out, the lead can cause damage to the kidneys. Such damage is often not discovered until much of the kidney's function has been lost. Lead can cause damage to the extent that the kidneys fail. Kidney failure can cause death.

The Female Reproductive System: Lead is very dangerous to the female reproductive system. As in the male, it can cause decreased sex drive and infertility. In addition, it can cause abnormal menstrual cycles, premature births, and miscarriages. A pregnant woman's body absorbs up to 50% of the lead taken in. During pregnancy, her body must take in nutrients for herself and for the baby. If she is exposed to lead, her body will absorb it quickly. Lead can be released from her bones, even if her exposure to lead was 20 years earlier. Lead not only makes the woman sick, but causes damage to the fetus as well. Lead affects her children by causing birth defects, low birth weights, learning problems, and behavioral problems.

How Long Does Lead Stay in the Body?

Even a small amount of lead can cause illness and damage. Once lead gets into the body, it stays in the blood for several months, and can be stored in the bones for 30 years or more! The more lead a person is exposed to, the more likely they are to get lead poisoned. Many small doses of lead over a long period of time can cause lead poisoning. One large dose of lead in less than a day can also poison you. A blood test is the only way to find out how much lead is in a person's blood. The amount of lead in the blood is called the "blood lead level (BLL)." A blood test will show how much lead a person has been exposed to recently.

US Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry. *Case Studies in Environmental Medicine, Lead Toxicity*. Washington, DC: September 1992.

How Much Lead is Dangerous?

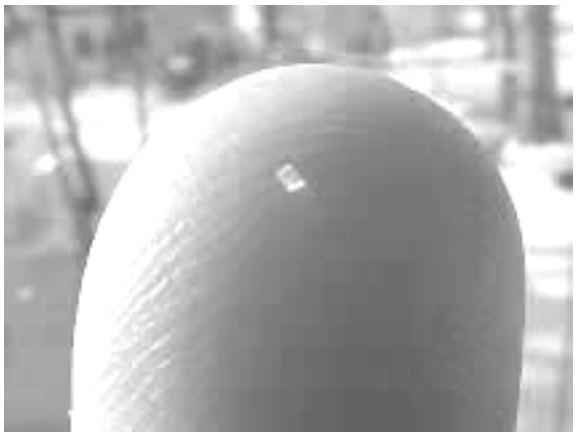
Blood Lead Level:

Because lead poisoning does not always have symptoms, the most common way to measure the amount of lead in your blood is the Blood Lead Level (BLL) test. The BLL test:

- Measures the amount of lead that is circulating in your blood.
- Tells you about your exposure to lead in the last 2-3 weeks.
- Does not tell you the total amount of lead in your body.
- Does not tell you if any long-term damage has occurred.
- A blood lead level above **10 µg/dl** is not safe for children or for women during pregnancy. The Centers for Disease Control and Prevention consider this to be the "level of concern."
- A level of **39 µg/dl** or less may mean that damage to your body is occurring, even if you have no symptoms.
- A level of **40 to 49 µg/dl** means that serious health damage may occur.
- A level of **50 µg/dl** or greater means that severe health damage is likely, may be permanent, and may occur quickly.
- EPA requires employers to remove employees with blood lead levels above 50 µg/dl to jobs that do not contain lead until the BLL is significantly reduced. (See section on Medical Removal.)
- HUD's "environmental intervention blood lead level" means a confirmed concentration of lead in whole blood equal to or greater than 20 µg/dl for a single test or 15-19 µg/dl in two tests taken at least 3 months apart.

Studies have shown that lead can harm health at blood levels of 10 µg/dl and perhaps lower.

How large is 10 µg/dl? Imagine a grain of sugar cut up into 1000 pieces. Now picture 10 of those tiny pieces of the sugar grain dissolved in a half cup of liquid. That tiny amount of lead in the blood can cause health problems!



Adult Reactions to Lead

The following chart gives a rough estimate of an adult's reaction to different blood lead levels:

- 10 µg/dl — Increased blood pressure; harmful effects on fetus; joint and muscle aches.
- 25 µg/dl — Reproductive problems.
- 40 µg/dl — Kidney damage; damage to blood formation
- 60 µg/dl — Anemia; nerve damage; constipation; stomach pain; irritability and fatigue; memory and concentration problems; clumsiness; drowsiness and sleep problems.
- >80 µg/dl — Blue line on gums; uncontrollable shaking of hands; wrist and foot drop; hallucinations; brain damage; coma; death.

Source: ATSDR 1989; California Health Department 1993

Children are at High-risk

Children can be poisoned by lead very quickly. Their rapidly growing brain, nervous system, and body are easily damaged by lead, even by small doses. These effects are developmental in nature. They show up in the child's behavior and learning ability. They are often easily frustrated, have attention problems [otherwise known as Attention Deficit Disorder (ADD)], lose their acquired skills, and become hyperactive (and exhibit behavior disorders).

The developmental problems caused by lead can have a long-term impact on a child's life. Severe levels of lead may result in seizures, coma, and death.

Children are at a greater risk of lead posioning than adults because during normal and frequent playing or hand-to-mouth activity, children may swallow or inhale dust from their hands, toys, food, or other objects. Toddlers (age 1 to 3), especially, are at a very high-risk of lead poisoning. Toddlers frequently crawl on the floor and put things into their mouths. Consequently, toddlers ingest a lot of lead dust.

The primary source of lead exposure for children is lead dust. Up to 50 percent of the lead that children and pregnant women take in is absorbed into their bodies. About 10 - 15 percent of the lead that adults take in is absorbed. It may seem strange that the body readily accepts and absorbs a poisonous material like lead. This occurs because the body "sees" lead as calcium, a harmless and necessary nutrient. For this reason, a person's body will hold more lead if they don't have enough calcium or iron in their diet.

Child Reactions to Lead— Research suggests that lead affects a child at blood lead levels of 10 μg/dl, and possibly lower. Every child is different in his or her reaction to lead. The following list gives a rough estimate of a child's reaction to various blood lead levels:

- 10 μg/dl — Loss in IQ (not as smart as they should be); hearing and growth problems. This is the CDC "Level of Concern."
- 20 μg/dl — Hyperactivity; poor attention span; difficulty learning; language and speech problems; slower reflexes.
- 40 μg/dl — Poor bone and muscle development; clumsiness; lack of coordination; early anemia; fewer red blood cells to carry oxygen and iron; tiredness; drowsiness.
- 50 μg/dl — Stomach aches and cramps; anemia; destruction of red blood cells; brain damage.
- 150μg/dl — Swelling of the brain; seizures; coma; death.

How Can Lead Poisoning be Eliminated?

Chelation is the medical treatment for severe lead poisoning. It is a risky treatment. Chelation can get rid of some of the lead in your body, but it can be harmful to your health. Chelation is a serious medical treatment. Prophylactic chelation means giving chelating drugs to someone to try to

prevent lead poisoning. Chelating drugs will not protect anyone from lead poisoning. Chelating drugs will only help remove lead from your body after you have been poisoned. **It is illegal for your employer or anyone employed by your employer to give you prophylactic chelation.**

Control Lead-based Paint Hazards

Lead-based paint hazards in homes should be controlled. It is important to minimize exposure to lead dust by reducing the creation of dust. When a lead hazard is identified, the source of the problem must be addressed. For example, if paint is chipping off a ceiling due to moisture from a leaking pipe, the pipe should be fixed before repairing the damaged paint. Work practices that reduce the creation of lead dust should be used; these methods are called "lead-safe work practices." Using "wet methods," and frequent, thorough, and proper cleaning can reduce lead dust. Lead safe work practices are discussed in more detail later and are not expensive to implement.

Education

Increasing public awareness of lead hazards, the health affects of lead exposure, and of ways that lead exposure can be minimized are important steps in reducing the occurrence of lead poisoning.

Protection

When you work with lead, you have a higher risk of getting lead poisoning. You need to do as much as possible to reduce that risk. Here are some things that you can do:

- Make sure your employer provides a safe workplace
- Know your rights as a worker
- Wear protective gear
- Use safe work practices
- Wash your hands and face frequently, especially before eating drinking, or smoking
- Don't take lead home on your clothes or in your car
- Get routine medical exams
- Inform your employer if you develop signs of lead poisoning
- Do non-lead related work if your blood lead level gets too high

- Eat a balanced diet

Practice Good Nutrition

Good nutrition is also important. A diet with plenty of iron and calcium will reduce the amount of lead your body absorbs when you are exposed to it. Since the body "sees" lead as calcium, people who do not eat a well-balanced diet have increased lead absorption. Foods high in iron, calcium, vitamin C, zinc, and protein reduce absorption; foods high in fat tend to increase absorption of lead.

Key Facts

Lead Poisoning

- Symptoms of lead poisoning may develop quickly, but are often not seen until severe damage has been done.
- The health effects of lead poisoning are often difficult to recognize.
- The signs and symptoms of lead poisoning are often mistaken for a cold or the flu and include:
  - Tiredness
  - Sleep problems
  - Dizziness
  - Irritability
  - Nervousness
  - Headaches
  - Difficulty concentrating
  - Depression
  - Forgetfulness
  - Hyperactivity
  - Problems having healthy children
  - Wrist or foot drop
  - Weakness
  - Clumsiness
  - Joint and muscle pain
  - Vomiting
  - Loss of appetite
  - Stomach aches
  - Constipation
  - Metallic taste in mouth
  - Numbness

Entry into Body

- There are only two ways that lead can get into the body, it is either breathed in or swallowed.
- Lead particles can be swallowed if a person eats, drinks, smokes, or places fingers into their mouth, without washing his or her hands, after coming into contact with lead dust.
- Lead ingestion that occurs when hands or fingers are placed into the mouth is called “hand-to-mouth.”
- Lead is not absorbed through the skin.
- Lead ingestion that occurs as a result of eating, drinking, or smoking is called “transfer.”
- Acute exposure occurs when someone is exposed to a lot of lead over a short time period.
- Chronic exposure occurs when someone is exposed to small amounts of lead over a period of time and is more common than acute exposure.

Effects on Body

- Lead affects EVERY major body system (blood, heart, kidneys, nervous system, bones, and reproductive organs).
- Within pregnant women, ingesting lead can result in miscarriages, premature labor, still births, and developmental delays in the fetus and in the child after birth.
- Lead is seen by the body to be similar to Calcium.
- The bones and teeth store 95% of the lead in the body.
- When lead attaches to red blood cells, they die sooner causing anemia.
- In bone tissue, lead blocks the production of new blood cells.
- Lead is stored in the blood for approximately 25 days; the soft tissues for 40 days; and in the bones for more than 25 years.
- Lead in the male reproductive system decreases sex drive, erectile function, fertility, and damages sperm.
- Lead damages the brain and may kill brain cells. The result can be depression, irritability, forgetfulness, clumsiness, and loss of intelligence.
- Lead can cause damage to the kidneys leading to organ failure and death.
- Lead in the female reproductive system decreases sex drive, fertility, and causes abnormal menstrual cycles, premature births, and miscarriages.
- During pregnancy, a woman's body takes calcium, and, thus lead, out of the body to nourish the fetus. Thus, a lead-poisoned woman may damage her fetus as well. Her babies may have birth defects, low birth weights, learning problems, and behavioral problems.
- Lead may be stored in the body for 30 years or more.

Levels of Lead

"Blood Lead Level" test measures the amount of lead in blood.

- Blood lead levels are reported in μg/dl (micrograms of lead per deciliter of blood).
- Tells you about your exposure to lead in the last 2-3 weeks.
- Does not tell you the total amount of lead in your body.
- Does not tell you if any long-term damage has occurred.

Reaction to Levels of Lead

- < 10 μg/dl is considered safe.
- 10 μg/dl is the CDC's "level of concern" for children.

- > 10 μg/dl is considered not safe for children or pregnant women.
- 39 μg/dl or less may mean that damage to your body is occurring.
- 40 to 49 μg/dl means that serious health damage may occur.
- 50 μg/dl or greater means that severe health damage is likely, may be permanent, and may occur quickly. EPA requires employers to remove employees from the work exposure (Medical Removal).
- 60 μg/dl — Anemia; nerve damage; constipation; stomach pain; irritability and fatigue; memory and concentration problems; clumsiness; drowsiness and sleep problems.
- >80 μg/dl — Blue line on gums; uncontrollable shaking of hands; wrist and foot drop; hallucinations; brain damage; coma; and death.

Children at Greatest Risk

- Their rapidly growing brain, nervous system, and body are easily damaged by lead, even by small doses.
- Children absorb calcium (thus lead) faster than adults do. Up to 50 percent of the lead that children and pregnant women take in is absorbed into their bodies whereas 10 - 15 percent of the lead that adults take in is absorbed.
- Children and toddlers are at a greater risk than adults are because during normal and frequent playing or hand-to-mouth activity, children may swallow or inhale dust from their hands, toys, food, or other objects.
- Lead affects children's behaviors and learning abilities including loss of IQ, hearing, agility, and more.

Prophylactic Chelation

- Chelation is a serious medical treatment for severe lead poisoning.
- It is a risky treatment.
- Chelating drugs will not protect anyone from lead poisoning.
- It is illegal for your employer or anyone employed by your employer to give you prophylactic chelation.

Preventing Lead Poisoning

- Control lead-based paint hazards in the home.
- Minimize dust exposure.
- Make sure your employer provides a safe workplace.
- Wash your hands and face frequently.
- Eat a balanced diet high in iron and calcium.

- Lead-safe practices are not burdensome or expensive.
- Lead-safe practices act to reduce lead dust through the use of "wet" procedures and "clean" work practices.

SECTION 2 • LEAD REGULATIONS AS APPLIED TO PROPERTY OWNERS, MAINTENANCE WORKERS, AND RESIDENTS

OSHA, HUD, and EPA are the three agencies that have created the majority of regulations concerning lead that impacts the residential rental industry. This section discusses the Lead in Construction Standard and explores how it affects property owners and maintenance contractors (which are sometimes the same people). HUD regulations are then presented as they create specific conditions property owners and maintenance workers must adhere to protect the health and safety of residents. A number of definitions and work practices specified by OSHA are different from HUD. A review of these differences is made. Finally, the laws that regulate waste disposal are presented.

CHAPTER 4 — Title X and Lead in Construction Standard

Title X Guidelines

Title X required EPA, HUD, and OSHA to develop specific guidelines to provide for the protection of workers and residents from lead-based paint hazards.

Title X, section 402 (c) (1), required the **EPA** to write guidelines regulating contractors, maintenance workers and others should conduct renovation and remodeling activities of target housing, public buildings constructed before 1978 and commercial buildings, which may create a risk of exposure to dangerous levels of lead. EPA published the guidelines in a pamphlet called "Reducing Lead Hazards when Remodeling Your Home."

Guidelines on Measuring and Controlling Lead-Based Paint Hazards (Title X — Section 1017)

Under Title X, section 1017, **HUD** was required to establish guidelines for lead-based paint hazard evaluation and reduction. These guidelines provide information on how to control lead-based paint hazards in-place and minimize the creation of lead hazards during routine maintenance work. HUD developed the "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing." The most recent revision of the HUD Guidelines is dated 1997. HUD's guidelines are considered the most protective methods of lead abatement and interim controls for workers and the general public. These guidelines are usually followed in federally owned and federally financed properties. Subsequently, HUD also developed a compact version of the Guidelines, in the form of a field guide.

Occupational Health and Safety Administration (OSHA) Lead Regulations

OSHA (The Occupational Safety and Health Administration) is a federal agency whose purpose is to develop and enforce standards that protect employees from work-related hazards. To protect employees from lead hazards, OSHA developed standards for General Industry (29 CFR 1910.1200) and Construction (29 CFR 1929.59). The OSHA Hazard Communication Standards cover all individuals that work with or around hazardous chemicals. It allows employees to gain access to information

about the hazards of substances they work around, safe work practices and how to protect themselves. They require employees to receive training about the specific chemicals in a workplace, labeling, and Material Safety Data Sheets. Employees are covered by one or more of these regulations if lead in their workplace is disturbed.

OSHA Lead in Construction Standard — 29 CFR 1926.62

The OSHA Lead in Construction Standard (29 CFR 1926.62) became law on June 3, 1993. Some of the requirements of this regulation are based on the work that is done; others are based on employee's potential for exposure. Employers need to be familiar with all of these requirements. The OSHA Lead in Construction Standard covers a broad range of work activities. This standard covers every phase of construction work, when and if employees have the potential for occupational lead exposure. The standard specifically states, "All construction work excluded from coverage in the general industry standard for lead by 29 CFR 1910.1025(a)(2) is covered by this standard." It also states, "Construction work is defined as work for construction, alteration and/or repair, including painting and decorating." Covered under this regulation is the demolition or salvage of structures where lead or materials containing lead are present and removal, enclosure or encapsulation may be large-scale projects. The terms, "removal, enclosure, or encapsulation" are also used to refer to activities done by specialty lead abatement contractors who are certified to do this type of work, so this standard clearly applies to those abatement activities as well.

Abatement

In general, "abatement" programs are designed to correct lead hazards by removal of paint, replacement of painted components, and other activities. The *intent* of the work is *permanent* control of the hazard.

Adopting a lead program does not make a renovator/remodeler an abatement contractor. Only certified abatement contractors can perform abatement activities. A lead program simply institutes practices for working safely in a lead environment and avoids the creation of lead hazards in the course of the renovating/remodeling work.

Renovators, remodelers, and maintenance workers are allowed to work on surfaces with lead paint as long as they follow OSHA worker protection guidelines. However, the stated intent of their work, as written in the contract, cannot be to abate the lead. Note: In some states, such as Ohio, if the presence of LBP is known, a trained, licensed lead abatement contractor (who can also be a rehab contractor) must perform the work — check with state and local regulations for specific requirements.

Construction Standard — Scope

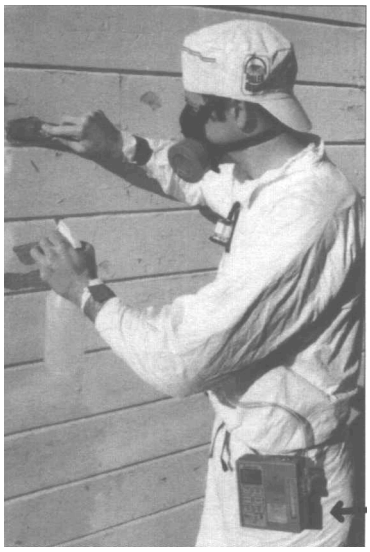
Many renovation and repair activities are covered under this regulation. Despite the fact that the Consumer Product Safety Commission limits the amount of lead contained in paint for residential use, other products used in new construction still contain lead (e.g., sheet lead used in roofing.) This regulation covers structures or substrates that contain lead, installation of products containing lead, or clean-up activities. Therefore, renovation and repair contractors, plumbers, roofers, welders, painters, and a host of other types of firms are covered by this regulation because they use lead. OSHA's definition of "lead" is very important. OSHA defines lead as, "metallic lead, all inorganic lead compounds, and organic lead soaps." Excluded from this definition are all other organic lead compounds. This means that OSHA has not limited employee exposure to lead from paint. OSHA does not put a limit on how much lead needs to be in a product for it to be a potential problem for employees. It means that any amount of lead from any source on a job site could be a problem. That is where knowledge about the products and activities on a worksite becomes important, and why training is a requirement in many OSHA regulations. OSHA does not define or regulate "lead-based paint." This is an EPA/HUD term. OSHA protects employees from exposure to lead from any source or during "lead-related trigger tasks."

The OSHA regulations affect construction and maintenance workers involved in the following work activities. These activities can cause exposure to lead because they involve working with lead dust and debris.

- The demolition and salvaging of structures that contain lead in paint or other components. (For example, in performing rehabilitation of an older home, walls covered with lead-based paint will be demolished and create large amounts of debris.)

- Removal, enclosure or encapsulation of materials that contain lead. (For example, removing a window creates dust and debris.)

- New construction, alteration, repair, renovation of any part or component of a structure that contains lead. For example, a structural member that is exposed to weather such as a carport.



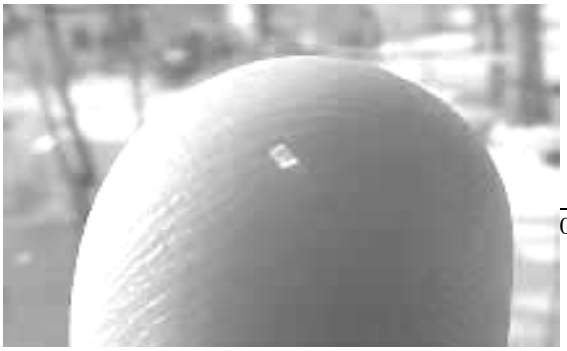
- Repainting

Construction and maintenance work involving moving or transport of lead or materials containing lead is also covered under this regulation. This includes disposing or storing of lead materials on a job site and associated maintenance work, including sorting waste materials, putting plastic drop cloths in bags for disposal, carrying bags of waste or building components to a dumpster, or other similar activities.

Construction Standard — Key Concepts

OSHA requirements depend on the level of lead exposure a worker has on the job. A "competent person" is responsible for identifing existing and predictable lead hazards and who has the authority to correct them. The competent person is responsible for assessing the job and having air samples taken in the worker's breathing zone and analyzed. Workers must be protected during this "exposure assessment." The employer is required to give employees the results of the air sampling within five working days of receiving the results. If a worker's potential for exposure is high, OSHA regulations are more stringent. These requirements are designed to protect workers with potential for exposure to lead.

Air sampling data is measured in micrograms per cubic meter ($\mu g/m^3$). Just how large is that? Again, if you take a grain of sugar, divide it into 1000



pieces, then take 50 of those tiny pieces and place them in a postal box, you would have a concentration equal to 50 $\mu g/m^3$, which is the legal maximum exposure to lead dust (known as the PEL which is discussed below).

The OSHA Standard sets two legal limits for the amount of lead workers are allowed to breathe:

Action Level

The "Action Level" for lead is **30 μg/m^3.**

Action Level means employee exposure, without regard to the use of respirators, to an airborne concentration of lead at or above 30 micrograms per cubic meter calculated as an 8-hour time-weighted average. If you work in an area that has (or is expected to have) airborne levels of lead at the Action Level, your employer must train you on the hazards of working with lead, and must also provide special medical exams called, "medical surveillance." Respirators, protective clothing, and other more restrictive procedures are not required at this level of exposure.

Permissible Exposure Level

The "PEL" for lead is **50 μg/m^3.**

Permissible Exposure Limit (PEL) means an employer is not allowed to expose an employee to lead at concentrations above 50 micrograms per cubic meter of air averaged over an 8-hour time period. If you work in an area with more lead in the air than the PEL, your employer must reduce your exposure. The PEL is the highest average amount of lead to which you are allowed to be exposed.

Calculating Exposure Levels

Action Level

OSHA has specified an Action Level of 30 μg/m^3 based on an 8 hour day. To calculate the Action Level for a different number of hours in the day, divide 240 by the number of hours. Thus, a 12-hour workday would yield an Action Level of 20 μg/m^3. A 16-hour workday would yield an Action Level of 15 μg/m^3. And a 4-hour workday would yield an Action Level of 7.5 μg/m^3.

From the chart Air Sampling Results (Typical) (pg. 59), we see that Carpet Removal, Window Replacement, Surface Preparation, and Drilling into Plaster are always below the Action Level. Drilling into Wood, if done continuously for 16 hours would exceed the Action Level.

Similarly, work that has high exposure, if done for a short time with no other lead exposure during the day, will not exceed the Action Level. For example, Sawing into Plaster has an average exposure level of 110 $\mu g/m^3$. The Action Level for a 2 hour day is 130 $\mu g/m^3$ (240/2 = 120 $\mu g/m^3$). Thus, Sawing into Plaster is below the Action Level if done for 2 hours or less. There must not be any other lead exposure during the rest of the workday.

PEL Level

The PEL of 50 $\mu g/m^3$ is also based on an 8-hour day. To calculate PEL for different length workdays, divide 400 by the number of hours. Thus, a 12-hour workday yields a PEL of 33 $\mu g/m^3$. A 4-hour workday yields a PEL of 100 $\mu g/m^3$.

High exposure jobs can be accommodated if they are done for short periods within one day. For example, both Paint Removal (power) and Sawing Wood have exposure levels in the mid-500s. If either of these were done for less than 1/2 hour, they would not exceed the PEL.

Recommendation

Does this mean that for jobs with potentially high exposure levels you do not need to take precautions as long as the exposure is short? No. Any job that has the potential of high exposure should be treated the same whether it is for a short time or a full day. The use of safe work practices will significantly reduce the risk of exposure and should be used at all times.

Trigger Tasks

OSHA's available data has identified high lead exposures related to specific tasks called "trigger tasks." Employers must provide a higher level of protection when employees perform lead-related trigger task until the exposure assessment shows that your exposure is below the PEL.

Group 1: Manual demolition of structures, dry manual scraping or sanding, using a heat gun, power tool cleaning with dust collection systems, spray painting with lead-based paint. NOTE: Group 1 activities, prior to initial assessments, require employee protection as if lead exposure is greater than 1-10 times the PEL (50 to 500 $\mu g/m^3$).

Group 2: Using lead-based mortar, burning lead, rivet busting, power tool cleaning without dust collection systems, movement or removal of abrasive blasting containment, clean up activities where dry expendable abrasives are used. NOTE: Group 2 activities, prior to initial assessments, require employee protection as if lead exposure 10-50 times the PEL (500 to 2500 $\mu g/m^3$).

Group 3: Abrasive blasting, welding, torch cutting, torch burning. NOTE: Group 3 activities, prior to initial assessments, require employee protection as if lead exposure is greater than 50 times the PEL (greater than 2500 $\mu g/m^3$)

A good strategy is to use "lead-safe" work practices (detailed later) to avoid engaging in "trigger tasks." Such an approach is the core of this "basic awareness" training. That way, employees are always working below the PEL, and extra precautions, including increased medical surveillance and certified employees, are unnecessary.

Air Monitoring

Title X, Section 402(c) required EPA to develop and issue guidelines to be used during conduct of renovation and remodeling activities which may create a risk of exposure to dangerous levels of lead. Section 402(c) also requires EPA to study the extent to which people engaged in various types of renovation and remodeling activities are exposed to lead and revise regulations to address renovators and remodelers.

Of primary concern for the real estate industry is whether small renovation and repair tasks generate high levels of lead dust. A preliminary 1997 study found the following results presented in the table below. These are considered typical, but, as of this writing, cannot be used to replace the need for individual contractors to conduct air monitoring for their specific tasks.

At this time, employers must develop their own database of airborne lead for specific tasks at specific locations using air-monitoring techniques.

New studies are being conducted to bring consensus to these numbers, and, may, obviate the need of contractors to develop their own database or engage in air sampling. See *Chapter 8 — Worker Protection* for details on air monitoring.

Air Sampling Results (Typical)

Air sampling is required to determine the level of risk a particular job poses to workers. It can be used to determine which respirator to use. For example, the graph below gives air-sampling results from various lead-related tasks. These are typical results and employers must conduct similar exposure assessments. Actual results may be different than shown. Using the results, employers will choose the appropriate respiratory protection.

Lead-Related Tasks (Not using lead-safe work practices)	**Average Exposure** ($\mu g/m^3$)
Carpet Removal	7.54
Window Replacement	7.48
Paint Removal (hand) *	254.00
Paint Removal (power)	571.00
Large Structure Removal (interior Demolition)	108.00
HVAC Work	49.60
Surface Preparation (interior)**	58.20
Surface Preparation (exterior)**	4.33
Drilling into Wood	15.10
Drilling into Plaster	6.76
Sawing Wood	546.00
Sawing into Plaster	110.00

Information above is taken from the EPA study, "Lead Exposure Associated with Renovation and Remodeling Activities: Summary Report, " May 1997

* Paint removal by continuous dry sanding activities.

**Surface preparation consisted of a wide variety of activities including wet and dry scraping, feathering of edges, and wet and dry sanding to prepare a surface for repainting.

Employer Requirements — Action Level and PEL

If the airborne levels of lead are at or just above the Action Level, employers must provide employees with Training and Medical Surveillance.

If an employee is exposed above the Permissible Exposure Limit (PEL) or performs "trigger tasks," and the employer has not performed an initial exposure assessment, the employer must provide more protection including engineering controls and work practice controls to reduce exposures below the PEL. This protection includes:

- Housekeeping: Good housekeeping includes maintaining all workplace surfaces free of lead dust accumulations. Good housekeeping involves a regular schedule to remove accumulated lead dust and debris, cleaning floors and other surfaces, vacuums with HEPA filters; (shoveling, dry or wet sweeping shall only be used where vacuuming has been tried and is ineffective), and HUD prohibits the use of compressed air to remove lead from surfaces. Note: Housekeeping is required for all lead jobs.
- Respiratory Protection, Protective Clothing/Equipment: The proper respirator for the job, respirator fitting and training; protective clothing such as coveralls, gloves, hats, shoes or disposable booties for the shoes, face shields or other appropriate equipment; no blowing or shaking of contaminated clothing, closed container for used protective clothing (Respiratory Protection 29 CFR 1910.134, Personal Protective Equipment 29 CFR 1910.132).
- Hygiene Facilities: Facilities for hand and face washing; showering, if feasible. Whenever you work with lead, your employer must have a place for you to wash your hands and face. Your employer must make sure that you wash your hands and face at the end of each work-shift. Your employer must have a place where anyone exposed above the PEL can shower, if feasible. OSHA officials have stated that if your employer decides having a shower is not feasible, he or she must be able to explain their reasoning to any OSHA inspector who comes on the site. The standard states employer must have places where anyone exposed above the PEL can change in and out of their work clothes (Sanitation 29 CFR 1926.27).
- Lunchroom: An accessible lunchroom facility or eating area must be available and be as free from contamination as practical. The

employer must **not** allow employees to eat, drink, smoke, chew tobacco, or apply cosmetics (including chap stick) in the work area where the exposure to lead is above the PEL.

- Medical Surveillance: Initial blood tests reviewed by a physician must be provided if an employee does any Group 1, 2 or 3 tasks ("trigger tasks") or if the employee is exposed at or above the Action Level any one day. Ongoing medical surveillance is required if an employee is exposed to lead at or above the Action Level for more than 30 days in a 12-month period.
- Medical Removal: Removal from lead work area if blood lead level is too high (50 μg/dl). The average adult typically has a blood lead level of less than 10 μg/dl.
- Chelation: The OSHA standard prohibits chelation to prevent lead poisoning (a chemical to remove lead from the body).
- Worker Education/Training Program: The OSHA Standard says that employers must provide training to anyone working with lead at or above the Action Level, doing any lead related task that is presumed to expose a worker to lead levels above the Action Level (i.e., trigger tasks), or who uses lead compounds which cause eye or skin irritation. The training should include: (1) OSHA Interim Final Lead in Construction Standard, (2) description of jobs that expose workers to lead above the Action Level, (3) information on respirators, their use, the different types, and the importance of a proper fit, (4) explanation of medical exams required for everyone working with lead, and (5) ways your employer can reduce your exposure to lead. Employees are required to attend annual training (refresher courses) besides the initial training.

Chart — Lead in Construction

The Federal Lead Exposure in Construction Standard, 29CFR 1926.62, requires that before beginning any construction work which may result in lead exposure, an employer must determine if any employee may be exposed to lead at or above the Action Level (30 $\mu g/m^3$). This determination must be written and posted. If any employee may be exposed at or above the Action Level, the employer must conduct air sampling at the start of the operation that may involve lead exposure. If the lead level is unknown, air sampling must be conducted. "Trigger tasks" are assumed to exceed the PEL unless otherwise shown by air monitoring to be less. The major requirements of the Lead in Construction Standard are detailed below.

Any Airborne Lead	**At or Above Action Level (30 $\mu g/m^3$)**	**Above PEL (50 $\mu g/m^3$) or "trigger tasks"**	
			CONDUCT EXPOSURE MONITORING
	X	X	— At start of job
	X		— Every six months
		X	— Every quarter
X	X	X	— When job change may result in new or additional exposure
X	X	X	— If employee complains of symptoms related to lead exposure
X			— If the lead level is unknown.
			Whenever exposure monitoring is performed, employees must be provided with written notice of results within 5 days.
		X	USE FEASIBLE ENGINEERING AND WORK PRACTICE CONTROLS
		X	DEVELOP WRITTEN COMPLIANCE PROGRAM AND REVIEW EVERY SIX MONTHS
		X	PROVIDE RESPIRATORY PROTECTION

Any Airborne Lead	At or Above Action Level (30 $\mu g/m^3$)	Above PEL (50 $\mu g/m^3$) or "trigger tasks"	
		X	— As interim measure
		X	— To supplement engineering and work practice controls
		X	— When controls not feasible
		X	— Upon employee request *When respirators are provided, a respiratory protection program in accordance with 29 CFR 1910.134 (b), (d), (e), and (f) must be established and fit testing must be conducted. A medical examination must be provided if an employee exhibits difficulty breathing during respirator fit test or use. An employer must provide a powered air-purifying respirator at the employee's request.*
		X	PROVIDE APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT
		X	— Clean clothing weekly (daily if exposure above 200 $\mu g/m^3$
		X	— Assure protective clothing removed at end of shift
		X	— Assure appropriate laundering or disposal
		X	— Clean and repair equipment *Protective clothing and equipment must also be provided when the possibility of skin or eye irritation exists.*
X	X	X	MAINTAIN ALL SURFACES AS FREE OF LEAD AS POSSIBLE
X	X	X	— Prohibit cleaning by compressed air
X	X	X	— Use vacuuming or other equally effective cleaning methods
X	X	X	— Use wet methods when vacuuming not feasible.
		X	PROHIBIT EATING, DRINKING, AND SMOKING IN JOB AREA

Any Airborne Lead	At or Above Action Level (30 $\mu g/m^3$)	Above PEL (50 $\mu g/m^3$) or "trigger tasks"	
		X	— Provide eating and drinking area
		X	— Assure employees wash prior to eating or drinking
		X	— Assure employees do not enter eating area in lead contaminated clothing
		X	PROVIDE CHANGE AREAS AND STORAGE
		X	— Assure employees do not leave job area in contaminated clothes
X	X	X	PROVIDE WASH FACILITIES [29 CFR 1926.51 (f)]
			— Be sure employees wash at end of shift
X	X	X	PROVIDE LAVATORY FACILITIES [29CFR 1926.51 (c)]
	X	X	INSTITUTE MEDICAL SURVEILLANCE PROGRAM Biological monitoring (Blood Lead + ZPP or FEP Levels)
	X	X	— Prior to assignment
	X	X	— Every two months for first six months or exposure
	X	X	— Written notification of results to employee
			Medical examination must be provided when exposure is above action level and employee has developed signs or symptoms associated with lead intoxication, desires advice on effects of exposure on ability to procreate, or employee's blood lead level is at or above 40 mg/100g. A medical examination must also be provided when an employee exhibits difficulty breathing during respirator fit test or use.
			PROVIDE MEDICAL REMOVAL AND PROTECTION

Any Airborne Lead	At or Above Action Level (30 $\mu g/m^3$)	Above PEL (50 $\mu g/m^3$) or "trigger tasks"	
	X	X	— If blood lead level is at or above 50 μg/dl
	X	X	— If indicated by a final medical determination
X	X	X	INFORM EMPLOYEES OF STANDARD
X	X	X	— Make available a copy of standard
	X	X	PROVIDE TRAINING PROGRAM *Training must also be made available if the possibility of skin or eye irritation exists.*
		X	POST WARNING SIGNS
			MAINTAIN RECORDS OF
X	X	X	— Initial determination
X	X	X	— Exposure monitoring
	X	X	— Medical surveillance
	X	X	— Medical removal

This chart is intended to summarize the Federal Lead Exposure in Construction Standard, 29 CFR 1926.62 and is not to be interpreted as the complete requirements under the standard.

Compliance Plan Details

OSHA requires employers to develop a lead compliance plan indicating how they intend to comply with the lead requirements.

The plan should address the following areas:

- Signage.
- Record Keeping.
- Observation Procedure.

Note: OSHA requires the development and implementation of a written compliance plan prior to the commencement of the job where employee exposure to lead without the use of respiratory protection will be in excess of the PEL. See Section 4 for a step-by-step Compliance Plan.

Signs for Work Above the PEL

The regulation also requires signs in the work area where employees are exposed at or above the PEL. Signs must be kept clean and illuminated. The sign must say:

WARNING LEAD WORK AREA POISON NO SMOKING OR EATING

If the work involves abatement, there are some additional requirements.

For abatement work under Cal/OSHA, besides the above sign, you must post the "Abatement of Lead Hazards Notification" (Department of Health Services Form 8551). This form must be submitted to DHS 5 days prior to commencement of work.

HUD makes no differentiation between the signage requirements for abatement or interim work. However, after abatement work is completed and clearance verified, the Clearance Test must be posted within 15 days.

Government Notification

Before Abatement work can begin, Department of Health Services requires Form 8551, Abatement of Lead Hazard Notification, (see **Appendix**, page 288) to be submitted. Once work is completed, Form 8552 (see **Appendix**, page 289) is to be submitted.

Also, as of January 2002 (see letter **Appendix**, page 290), the California Division of Occupational Safety and Health, requires notification of lead work at least 24 hours before work commences. This is for work that either is abatement or uses "trigger tasks." Some lead-related construction work that involves very small amounts of lead is exempt from the notification requirement.

Contractors do not have to make this notification if:

- The lead content of the materials being disturbed is less than 0.5% (500 ppm by weight), or 1.0 mg/cm^2, or
- The amount of lead-containing materials to be disturbed is less than 100 square or 100 linear feet, or
- The only task performed consists of torch cutting or welding for no longer than 1 hour in any shift.

This form is found in the **Appendix**, page 291 and can be found at the Cal/OSHA web page at www.dir.ca.gov/DOSH/dosh1.html, or can be emailed to DOSHLeadNotice@dir.ca.gov.

Note, this DOSH form is separate from the DHS Form 8551, Abatement of Lead Hazard Notification, and does not pre-empt their lead abatement review procedures.

Recordkeeping/Monitoring Observation

The employer must keep records of all employees, social security numbers, job duties, exposure assessments, type of respiratory protection worn on the job site, medical surveillance and medical removals. The employer must also keep good records of all lead exposure monitoring, medical surveillance, and medical removals. Refer to 29 CFR 1926.62(n) for specific information. Records must be kept for at least the duration of employment plus 30 years.

Employers must offer employees or their designated representative the opportunity to observe any monitoring of employee exposure to lead.

Employees must be provided the opportunity to observe all steps related to the monitoring of lead, and are entitled to an explanation of the measurement procedure, the right to record results or receive copies of results when returned from the lab.

Key Facts

Title X, Section 402(c)(1)—

- EPA guidelines on how contractors, maintenance workers and others should conduct renovation and remodeling activities of target housing.
- Study the extent to which people engaged in various types of renovation and remodeling activities are exposed to lead.

Title X, Section 1017—

- HUD "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing."
- Most protective methods of lead abatement and interim controls for workers and the general public.

OSHA Lead in Construction Standard (29 CFR 1926.62)

- Became law June 3, 1993.
- Covers a broad range of work activities.
- "Abatement" programs *intend* to *permanently* control the hazard.
- Only certified abatement contractors can perform abatement activities.
- Renovators, remodelers, and maintenance workers are allowed to work on surfaces with lead paint as long as they follow OSHA worker protection guidelines.
- OSHA does not put a limit on how much lead needs to be in a product before it becomes a potential problem for employees.
- OSHA does not define or regulate "lead-based paint." This is an EPA/HUD term.
- OSHA protects employees from exposure to lead from any source or during "lead-related trigger tasks."
- Law does not always require the removal of lead-based paint.

Work Activities Regulated by OSHA:

- The demolition and salvaging of structures that contain lead in paint or other components.
- Removal, enclosure or encapsulation of materials that contain lead.
- New construction, alteration, repair, renovation of any part or component of a structure that contains lead.
- Repainting.

Construction Standard Key Concepts

- Assess and identify lead hazard
- Taking air samples of the worker's breathing zone.

Air Sample Limits

Air monitoring must always take place if the air lead level is unknown or known to be above the Action Level.

"Action Level" for **lead is 30 μg/m^3** (calculated over an 8-hour period)
Employer must:

- train employees on the hazards of working with lead
- provide special medical exams called, "medical surveillance."
- respirators, protective clothing, and other more restrictive procedures are not required at this level of exposure.

"Permissible Exposure Level (PEL)" for lead is **50 μg/m^3** (calculated over an 8-hour period)
Employer must:

- Same as Action Level but respirators, protective clothing, and other more restrictive procedures are required at this level of exposure.
- All workers and supervisors must be certified lead workers.

Trigger Tasks

- OSHA has determined certain tasks almost always cause lead exposure above the PEL, even if they are done for only short periods of time.
- Doing these tasks automatically "trigger" special requirements.
- Only state certified workers may engage in these tasks unless it is proven by air sampling that lead levels are below the PEL.
- Engaging in trigger tasks is beyond the scope of this course.

  Group 1: Manual demolition of structures, dry manual scraping or sanding, using a heat gun, power tool cleaning with dust collection systems, spray painting with lead-based paint. NOTE: Group 1 activities, prior to initial assessments, require employee protection as if lead exposure is greater than 1-10 times the PEL (50 to 500 μg/m^3).

  Group 2: Using lead-based mortar, burning lead, rivet busting, power tool cleaning without dust collection systems, movement or removal of abrasive blasting containment, clean up activities where dry

expendable abrasives are used. NOTE: Group 2 activities, prior to initial assessments, require employee protection as if lead exposure 10-50 times the PEL (500 to 2500 $\mu g/m^3$).

Group 3: Abrasive blasting, welding, torch cutting, torch burning. NOTE: Group 3 activities, prior to initial assessments, require employee protection as if lead exposure is greater than 50 times the PEL (greater than 2500 $\mu g/m^3$).

A good strategy is to use "lead-safe" work practices and to avoid engaging in "trigger tasks." This approach is the core of "basic awareness" training.

Employer Requirements

Airborne levels of lead at or just above the Action Level, employers must—

- Provide employees with training
- Provide a Medical Surveillance Program for employees.

If airborne levels of lead above Permissible Exposure Limit (PEL), or employees engage in "trigger tasks," or the employer has not performed an initial exposure assessment, employers must provide the following protections—

- Housekeeping
- Respiratory Protection, Protective Clothing/Equipment
- Hygiene Facilities
- Lunchroom
- Medical Surveillance
- Medical Removal
- Chelation Disallowed
- Worker Education/Training Program

Additional Standards

OSHA requires a Compliance Plan that includes:

- Signage

WARNING LEAD WORK AREA POISON NO SMOKING OR EATING

- Record Keeping

- Observation Procedures

Government Notification

Department of Health Services (DHS) requires for abatement work:

- Form 8551, Abatement of Lead Hazard Notification, submitted before work begins.
- Form 8552, Lead Hazard Evaluation Report, submitted after work is completed.

As of January 2002, the California Division of Occupational Safety and Health (DOSH) , also requires notification of lead work at least 24 hours before work commences. Contractors do not have to make this notification if:

- The lead content of the materials being disturbed is less than 0.5% (500 ppm by weight), or 1.0 mg/cm^2, or
- The amount of lead-containing materials to be disturbed is less than 100 square or 100 linear feet, or
- The only task performed consists of torch cutting or welding for no longer than 1 hour in any shift.

Note, this DOSH form is separate from the DHS Form 8551, Abatement of Lead Hazard Notification, and does not pre-empt their lead abatement review procedures.

CHAPTER 5— Property Owner Responsibilities

Property owners are ultimately responsible for their property's lead-hazards. A few of those responsibilities are discussed here.

Disclosure During Sale or Lease of Property (Title X — Section 1018)

Congress, in section 1018 of Title X, required the disclosure of information concerning lead-based paint upon transfer of residential property that was constructed before 1978. In addition, Title X required EPA to prepare regulations that detail what information about lead-based paint hazards must be given to persons buying or leasing these homes. These regulations were issued March 6, 1996 and went into effect for large property owners (who own more than 4 residential units) on September 6, 1996, and for all other property owners on December 6, 1996. The disclosure requirements only apply to "target housing." Target housing includes most private housing, public housing, housing receiving Federal assistance and Federally owned housing built before 1978.

Exemptions include:

- "0-bedroom dwellings," such as lofts, efficiencies, and studios. The Interpretive Guidance issued by HUD included rental rooms in fraternity and sorority houses as "0-bedroom dwellings."
- Housing designated for the elderly and the handicapped unless children reside or are expected to reside there.
- Leases of target housing found to be lead-free by a certified inspector.
- Renewal of existing leases for which the information required has already been disclosed **and** there is no new information.
- Short-term leases of 100 days or less where no lease renewal or extension can occur.
- Sales at foreclosure.

These regulations require that before the person buying or leasing the home is obligated under any contract to purchase or lease the housing, the person selling or leasing the home must:

- Provide the person buying or renting the home with the EPA lead hazard information pamphlet, "*Lead Paint: Protect Your Family*."

This is the same pamphlet that renovators and remodelers provide to clients before conducting work.

- Disclose to the person buying or renting the home about the presence of any known lead-based paint and/or lead-based paint hazards in housing. Additional information regarding the location and condition of the painted surfaces must also be disclosed.
- Provide the person buying or renting the home with any records or reports available pertaining to lead-based paint and/ or lead-based paint hazards in the housing being sold or leased. This requirement includes records or reports regarding common areas and other residential dwellings in a multifamily target-housing property. For rental transactions property owners may provide a summary of the testing data, if the summary has been prepared by an accredited inspector. Even disputed inspection reports (i.e., inaccurate) and outdated reports (e.g. lead-contaminated dust that has been cleaned) need to be disclosed or made available.
- For sales transactions, allowpurchasers a 10-day period (unless the parties mutually agree in writing upon a different period of time) to conduct a risk assessment or inspection for the presence of lead-based paint or lead-based paint hazards.
- Attach specific disclosure and warning language to the sales or leasing contract.

Multiple Lessees

Lessors must provide one copy of the pamphlet per lease transaction; however, in cases involving multiple lessees (such a college living units rented on a yearly basis by groups of students, all of whom are required to sign as lessees), lessors should make additional copies of the pamphlet readily available and offer them to everyone who signs the lease.

Lessee Refusal to Sign Disclosure

When a lessee if unavailable for signature or refuses to accept the pamphlet and/or sign the disclosure form, lessors may certify attempted delivery of the pamphlet, disclosure information, and disclosure form. This certification may be included on the copy of the disclosure form retained by the lessor or attached to that disclosure form and should indicate exactly how delivery

was attempted and what occurred (e.g., sent material certified mail and never heard from lessee; lessee refused to sign disclosure form).

For example, lessors may deliver the pamphlet, disclosure information, and disclosure form by certified mail, return receipt requested. Lessors should then retain the signed certified mail receipt in their records as evidence that the material was delivered to the lessees. In cases where the lessee refuses to sign the disclosure form, lessors may certify in writing that the delivery was attempted and indicate why a signed and dated disclosure form could not be obtained.

Documentation and Liability

The seller and agent are required to retain a copy of the completed disclosure and acknowledgment, lease or attachment for 3 years from the completion date of the sale or commencement period of the lease. Besides the owner, the agent in the transaction is the person held legally responsible for the disclosure to occur.

It has been reported that some real estate agents and brokers are attempting to shift all lead disclosure responsibility to the seller. During the sales transaction, they claim to have no knowledge about lead hazards and direct the buyer to a form signed by the owner. This practice is untested in court, but most likely it will not shield agents and brokers from their liability. We recommend that real estate agents and brokers be forthcoming in their knowledge about lead hazards in their residential property transactions and encourage sellers to be complete in their reporting.

In some cases, disclosure may actually reduce the owner's liability since residents may be able to prevent exposure from the beginning. Under this rule, however, sellers, landlords, or agents who fail to provide the required notices and information are liable for triple the amount of damages. Furthermore, Section 1018(b)(4) authorizes the court to award court costs, reasonable attorney fees, and expert witness fees to a prevailing plaintiff.

Mortgage Lenders

The disclosure rule does not identify mortgage lenders as liable parties.

Common Areas

The rule requires that sellers and lessors disclose available lead information about common areas so that families can be informed about preventive actions. Common areas are those areas in multifamily housing structures that are used and accessible to all residents.

Additional Property

EPA and HUD consider the following to be examples of items associated with residential use: garages for personal vehicles, storage sheds, play areas and play equipment, air conditioners, storage tanks for home fuel, yards, driveways, fences, and signs. Such items are covered by the disclosure rule in addition to structures actually used by people as living quarters and structures attached to living quarters. For most urban and many suburban residential lots, the entire property is normally considered as being devoted to residential use and subject to the rule.

Existing Leases

Sellers and lessors are not required to give existing residents the EPA pamphlet *Protect Your Family from Lead in Your Home* until they *renew* their leases.

Owners may send disclosure forms to all existing tenants at one time without waiting for the tenants to renew their leases. However, if disclosure is made in advance of lease renewal and the owner subsequently obtains new information relevant to disclosure, this new information must be disclosed before the lessee become obligated under a new lease.

Multiple Languages

If the buyer or renter signed a purchase or lease agreement in a language other than English, the rule requires that the disclosure language be provided in the alternative language.

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Checking for Lead or Removal of Lead

The rule does not require the seller to conduct or finance an inspection or risk assessment prior to sale. The seller, however, is required to provide the buyer a 10-day period to test for lead-based paint or lead-based paint hazards. This 10-day period can be shortened, lengthened, or eliminated by approval of both parties. Likewise, the rule does not require a building owner to remove lead-based paint or hazards discovered during an inspection or risk assessment unless this is made part of the sale/lease agreement.

Agent Responsibilities

Real estate agents must ensure that:

- Sellers and landlords are made aware of their obligations under this rule.
- Sellers and landlords disclose the proper information to lessors, buyers, and tenants.
- Sellers give purchasers the opportunity to conduct an inspection.
- Lease and sales contracts contain the appropriate notification and disclosure language, and proper signature.

Agents are responsible if the seller or lessor fails to comply with the rule; however, agents are not responsible for information withheld by the seller or lessor.

The seller or lessor may authorize a representative or agent to fulfill the seller or lessor's requirements under the disclosure rules; however, the seller or lessor is ultimately responsible for full compliance with the requirements of this rule. The representative must disclose the presence of lead-based paint or lead-based paint hazards if known by either the representative or the seller or lessor and disclose and provide records available to the representative and the seller or lessor. The designated representative or agent may sign on behalf of the seller or lessor. If the representative or agent acting on behalf of the seller or lessor is also functioning as an Agent, as defined under 24 CFR 35.86 and 40 CFR 745.103, they are also required to carry out those duties and to sign the certification in that capacity.

Co-ops, Condos, and Timeshares

EPA and HUD recognize that co-ops and condos can be structured in a variety of ways.

Under the final rule implementing Section 1018, the disclosure responsibility rests with the owner(s) of the target housing which is being sold or leased. Generally, the "owners" in co-op and condo arrangements are the persons who purchase shares in the co-op and possess occupancy rights to individual units or purchase a condo unit and a percentage of the common area, or lease individual units from the co-op or condo. The co-op corporation or condo association represents the joint interests of these owners. EPA and HUD believe that, in such situations, the responsibility for disclosure regarding the unit being sold or leased should reside with the individual owners of the unit. This responsibility also includes disclosure of information concerning common areas.

Lead-based paint information, particularly regarding common areas, may not be in the hands of the individual owners. In such cases, it may be administratively more efficient for individual owners to arrange for disclosure of information through the corporation or association. But in no instance should information held by the corporation or association be withheld, as it is considered known information held by the individual owners or reasonably obtainable by the owners, i.e., the corporation or association simply holds such information for the benefit of the individual owners and in no way does the representative arrangement shield the individual owners from disclosure responsibility.

On occasion, a co-op or condo association, rather than an individual unit owner, may possess occupancy rights (however denominated) to a unit being transferred at the point of transfer. In these cases, the co-op or condo association, rather than a unit owner, must comply with the disclosure requirements of the rule.

In co-op arrangements where owners purchase shares and also lease access to individual units from the co-op, EPA and HUD consider the purchase of shares to be the primary transaction for purposes of the disclosure rule. Therefore, in those cases, EPA and HUD do not consider the co-op to be a

lessor and the individual unit "owner" to be the lessee and would not impose separate disclosure requirements on the co-op as lessor under this rule.

Similarly, timeshares can be structured in a variety of ways. Nevertheless, the owner(s) of a timeshare must disclose in any sale or lease of the timeshare, if the unit qualifies as target housing. Thus, as with all sales or leases under the final rule, the disclosure responsibility rests with the owner(s) of the target housing who is selling or leasing a timeshare, and such an obligation is not affected by multiple-ownership arrangements.

Owners who are selling or leasing a timeshare should disclose any information they have about the presence of lead-based paint or lead-based paint hazards in the timeshare. In this case, EPA and HUD would consider "reasonably obtainable" records to include those records retained by the management company for the timeshare.

Owners of timeshares who lease the unit should note the relief from disclosure responsibility provided in 24 CFR § 35.82(c) and 40 CFR § 745.101(c). These provisions exclude short-term leases of 100 days or less, where no lease renewal or extension can occur, from coverage under the final rule. In the case of timeshares, EPA and HUD have interpreted this exclusion to mean leases of 100 consecutive days per visit.

Disclosure Documents

HUD recognizes that, in some situations, it may be burdensome to lessors to provide lessees with all available records or reports pertaining to lead-based paint and/or lead-based paint hazards. HUD and EPA have determined that lessors may provide lessees with a summary of all paint inspection and risk assessment reports as long as a certified paint inspector or risk assessor prepares the summary. Lengthy court documents and construction documents may be excerpted as long as sufficient background information is presented so as to maintain the context of the excerpts. In situation where documents are excerpted or summarized, they must be accompanied by a list of all-complete records and reports available to the lessee and the lessee must be afforded the opportunity to review the complete documents in a central location on the premises. In the case of sales transactions, the seller must provide complete documents to the buyer, rather than excerpts or summaries.

All known information must be disclosed, even if lead-based paint or lead-based paint hazards have been abated. Section 1018 requires disclosure of any available lead hazard evaluation reports, including those that indicate a hazard has been corrected.

EPA and HUD have deemed electronic transfer of documents acceptable only if the purchaser or lessee agrees in writing to accept the documents in that format.

Unit vs. Whole Building

In cases where there have been building-wide evaluation or reduction activities, EPA and HUD require the information and/or reports be made available to all units. This is true even if evaluations were not made in every unit of a large multifamily property. The report's findings relevant to every unit, because the evaluation was designed to provide information on the housing as a whole.

Month-to-Month Leases

Although month-to-month leases may seem to qualify as a short-term lease of 100-days or less, the "open-ended" nature of the lease results in these types of leases needing to meet disclosure requirements. The rules apply to the time of the initial lease agreement. When leases are changed—such as converting from a long-term lease to month-to-month, or a rental rate adjustment—either an initial disclosure would be required if no disclosure had been made, or a disclosure would be required of any new information obtained subsequent to an initial disclosure.

Determining a Lead-Based Paint Free Status

All inspections for purposes of the lead-based free exemption must be performed by an inspector certified in the Federal or Federally authorized program applicable in the State where the inspection takes place. The sampling guidelines provided in Chapter 7 of the HUD's "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing," (HUD Guidelines), June 1995, or the State protocol needs to be followed.

The results of inspections made before the implementation of section 402/404 are considered valid and reinspection is not required. If the inspection was made by a non-certified inspector, the findings can be affirmed if they are reviewed and approved in writing by a certified inspector.

See the Appendix (pages 286-295) for applicable disclosure forms. These forms are for housing rentals and leases (English and Spanish) and for housing sales (English and Spanish).

Owners Performing Maintenance/Construction/Renovation

Some residential rental property owners conduct their own maintenance and repairs. See the next section for rules and regulations affecting businesses that perform maintenance, repairs, renovation, remodeling, or construction of residential rental property. Owners and his or her employees must conform to these laws.

Use of Contractor to Perform Maintenance/Construction/Renovation

Often times an outside contractor is used by property owners and management companies. Many issues arise out of these arrangements.

Liability

The liability arising out of maintenance/construction/renovation of residential rental property should be clarified between the owner and the contractor. In Civil Code Section 2782.5 states:

> "Nothing contained in Section 52782 shall prevent a party to construction contract and the owners of other party from whose account the construction contract is being performed from negotiating and expressly agreeing with respect to the allocation, release, liquidation, exclusion or limitation as between the parties for any liability (a) for design defects, or (b) of the promissee to the promisor arising out of or relating to the construction contract."

In Markborough California, Inc. v. Superior Court, 227 Cal. App. 3D 705 (1991), the court ruled that this law was intended to clarify the ability of the parties to a construction contract to negotiate agreements that apportion liability. It is intended to allow limitation of liability clauses that allocate, release, liquidate or exclude liability that may otherwise arise under the contract.

Thus, contractors and owners can specify the liability arising out of the work to be performed. The **Appendix** gives sample language that can be used between owners and contractors in **work not requiring clearance testing** (**page 296**) and **work requiring clearance testing** (**page 296**). Also, proposed language to include an **arbitration and mediation clause** to help avoid court cases is provided in the **Appendix** (**page 297**). Ultimately, all liability rests with the owner and contractors are liable for their own work. The best way to avoid litigation is to perform work in a "lead-safe" manner.

Contract Elements for High-risks Lead Jobs

All high-risk lead tasks performed on residential rental property must be done by trained and state-certified workers. This policy should apply both to owner's and property management personnel and to outside contractors.

A high-risk lead task is one that:

- Can expose workers to lead dust or fumes above the Cal/OSHA Permissible Exposure Limit (PEL) of 50 $\mu g/m^3$, or

- Is considered to be lead abatement work that is designed to reduce a lead hazard for a minimum of 20 years.

If an outside contractor is hired to perform abatement work or other high-risk lead tasks, the following elements should be incorporated into any written contract:

License

The Contractor shall have a valid California State Contractors License in the classification appropriate to the work.

Worker Certification

- All high-risk lead tasks and lead abatement work shall be done under the supervision of a Certified Lead Supervisor with a current DHS certificate. This individual shall have direct control of all tasks, ensure that work is conducted in a lead-safe manner without producing lead hazards, and be responsible for enforcing safe work practices that comply with Cal/OSHA and other state requirements. The Certified Lead Supervisor shall be on site during all preparation and cleanup of work areas. At all other times when lead-related activities are underway, the Certified Lead Supervisor shall be on site or available by telephone, pager, or answering service, and shall be able to reach the site in no more than two hours.

- All high-risk lead tasks, and abatement work designed to reduce a lead hazard for a minimum of 20 years, shall be carried out by Certified Lead Workers with current DHS certificates.

- Contractor shall provide state-certified supervisors and workers for any task that disturbs or may disturb lead-based paint, presumed lead-based paint, or lead-contaminated soil, as defined by Title 17 of the California Code of Regulations, Division 1, Chapter 8. Certain tasks

may not require state-certified supervisors and workers. In any event, the Contractor shall be responsible for ensuring worker safety and Cal/OSHA compliance.

Insurance

In addition to any insurance requirements stated elsewhere in the Job Specifications or other contract documents, the Contractor shall provide evidence of insurance coverage for lead hazard reduction work (pollution liability) as follows:

- Combined single limit of $1,000,000 minimum for property damage per occurrence, or

- $500,000 minimum limit for bodily injury and $1,000,000 minimum limit for property damage per occurrence.

Worker Protection Programs

The Contractor shall maintain the following written programs as required by Cal/OSHA:

- Injury and Illness Prevention Program (IIPP).
- Hazard Communication Program (HAZCOM).
- Respiratory Protection Program.
- Site Safety and Health Plan.

Hazardous Waste

The Contractor shall ensure that hazardous waste is transported by a licensed hazardous waste transporter, except as allowed under small-quantity transportation rules. Hazardous waste shall be disposed of in accordance with all applicable state and federal regulations.

Submittals

The Contractor shall provide the following:

- List of Certified Lead Supervisors and Certified Lead Workers, and copies of certification cards.
- List of Subcontractors (or state "None").
- Certificates for General Liability Insurance and Lead Hazard Insurance, naming the District as an additional insured.
- A schedule submitted three days before starting work. Include specific dates for the beginning and ending of each phase of the work and dates for testing. The schedule shall be updated weekly.
- A copy of the completed DHS Form 8551, "Abatement of Lead Hazards Notification." The form must be provided prior to the start of any lead-related construction work.
- A copy of all Hazardous Waste Disposal Manifests, when these are required by applicable regulation.
- Copies of the Contractor's written:
  - Injury and Illness Prevention Program (IIPP)
  - Hazard Communication Program (HAZCOM).
  - Respiratory Protection Program.
  - Site Safety and Health Plan.

Hazardous Waste

The owner of a property owns the waste generated by that property in perpetuity. The contractor that creates lead-based paint chips, shavings, or lead tainted components is not responsible for the lead waste. The contractor is liable only for any solvents and other chemicals used during the renovation work.

If a contractor, as part of his or her contract with the owner, disposes of lead-based paint waste, he or she is simply the carrier of the waste, just as the disposal site is simply the repository of the waste. Neither the contractor or waste site is the owner of the waste. Ownership stays with the residential property owner forever.

There have been cases where hazardous waste disposal sites have gone out of business. EPA will review records and charge the residential property owner a fee to move the waste to a new site. Therefore, it is important for residential property owners to implement a waste management program as mandated by law. See Chapter 11 on hazardous waste for greater details.

Key Facts

Title X—Section 1018

- Requires disclosure of information concerning lead-based paint upon transfer (buying or leasing) of residential property that was constructed before 1978.
- Exemptions include:
  - "0-bedroom dwellings," such as lofts, efficiencies, and studios. The Interpretive Guidance issued by HUD included rental rooms in fraternity and sorority houses as "0-bedroom dwellings."
  - Housing designated for the elderly and the handicapped unless children reside or are expected to reside there.
  - Leases of target housing found to be lead-free by a certified inspector.
  - Renewal of existing leases for which the information required has already been disclosed **and** there is no new information.
  - Short-term leases of 100 days or less where no lease renewal or extension can occur.
  - Sales at foreclosure.

The person selling or leasing the home must:

- Provide EPA lead hazard information pamphlet, "*Lead Paint: Protect Your Family*" to buyers and leasees.
- Disclose the presence of any known lead-based paint and/or lead-based paint hazards in housing.
- Provide the person buying or renting the home with any records or reports available pertaining to lead-based paint and/or lead-based paint hazards in the housing being sold or leased, including common areas and other residential dwellings in a multifamily target-housing property.
- For sales transactions, permit the purchaser a 10-day period (unless the parties mutually agree in writing upon a different period of time) to conduct a risk assessment or inspection for the presence of lead-based paint or lead-based paint hazards.
- Attach specific disclosure and warning language to the sales or leasing contract.

Other conditions:

- Lessors must provide one copy of the pamphlet per lease transaction, not necessarily to multiple lessees.
- When a lessee is unavailable for signature or refuses to accept the pamphlet and/or sign the disclosure form, lessors may certify attempted delivery of the pamphlet, disclosure information, and disclosure form.
- The seller and agent are required to retain a copy of the completed disclosure and acknowledgment, lease or attachment for 3 years from the completion date of the sale or commencement period of the lease
- Besides the owner, the agent in the transaction is the person held legally responsible for the disclosure to occur.
- EPA and HUD consider garages for personal vehicles, storage sheds, play areas and play equipment, air conditioners, storage tanks for home fuel, yards, driveways, fences, and signs to be examples of items that are associated with residential use to which disclosure must be made.
- If the buyer or renter signed a purchase or lease agreement in a language other than English, the rule requires that the disclosure language be provided in the alternative language.

Real estate agents must ensure that:

- Sellers and landlords are made aware of their obligations under this rule.
- Sellers and landlords disclose the proper information to lessors, buyers, and tenants.
- Sellers give purchasers the opportunity to conduct an inspection.
- Lease and sales contracts contain the appropriate notification and disclosure language and proper signature.

Co-op, Condos, and Timeshares

- Disclosure requirements reside with the individual owners.
- Knowledge about common areas may reside with the association and must be provided to potential buyers.

Documents

- HUD and EPA have determined that lessors may provide lessees with a summary of all paint inspection and risk assessment reports as long as a certified paint inspector or risk assessor prepares the summary.

- Section 1018 requires disclosure of any available lead hazard evaluation reports, including those that indicate a hazard have been corrected.

Other Conditions

- Although month-to-month leases may seem to qualify as a short-term lease of 100-days or less, the "open-ended" nature of the lease results in these kind of leases needing to meet disclosure requirements.
- All inspections for purposes of the lead-based free exemption must be performed by an inspector certified in the Federal or Federally authorized program applicable in the State where the inspection takes place.
- Contractors and owners can specify the liability arising out of the work to be performed.

Contractors of High-risk Jobs

A high-risk lead task is one that:

- Can expose workers to lead dust or fumes above the Cal/OSHA Permissible Exposure Limit (PEL) of 50 $\mu g/m^3$, or
- Is considered to be lead abatement work that is designed to reduce a lead hazard for a minimum of 20 years.

Contractors must:

- Have a valid California State Contractors License.
- All workers must be certified with current DHS certificate.
- Insurance with combined single limit of $1,000,000 minimum for property damage per occurrence.
- $500,000 minimum limit for bodily injury and $1,000,000 minimum limit for property damage per occurrence.
- A copy of the completed DHS Form 8551, "Abatement of Lead Hazards Notification." The form must be provided to DHS prior to the start of any lead-related construction work.
- Have written programs:
  - Injury and Illness Prevention Program (IIPP).
  - Hazard Communication Program (HAZCOM).
  - Respiratory Protection Program.
  - Site Safety and Health Plan.

Hazardous Waste

- A licensed hazardous waste transporter transports hazardous waste, except as allowed under small-quantity transportation rules.

- The owner of a property owns the waste generated by that property in perpetuity.

CHAPTER 6—Contractor General Programs

Contractors have many responsibilities— to governmental agencies, property owners, employees, and residents. Federal and state agencies have enacted rules and regulations concerning lead-based hazards that contractors need to comply.

General Programs

Because lead-based paint is classified as a workplace and environmental hazard, here are a number of policies and programs every contractor needs to have in place. We will look at these first before reviewing (in the next chapter) the rules and regulations specifically targeting lead-based paint hazards under Title X.

These general programs include:

- Occupational Lead Poisoning Prevention Program (OLPPP)
- Injury and Illness Prevention Program (IIPP)
- Hazard Communication Program
- Medical Surveillance Program
- Employee Safety Training Program
- Compliance Program

Occupational Lead Poisoning Prevention Program

Title 17 of the California Code of Regulations Division 1, Chapter 11, Section 38001-5 established the requirement for specific employers to pay a fee to the Occupational Lead Poisoning Prevention Program. The industries identified under section 38005 include General contractors-Single-family houses (SIC Code 1521), Plumbing, heating, and air-conditioning (SIC Code 1711), Painting and paper hanging (SIC Code 1721), Roofing, siding and sheet metal work (SIC Code 1761) and Wrecking and demolition work (SIC Code 1795), besides many others not related to the real estate rental industry.

Fee Waiver

Businesses in these industries are able to obtain a waiver from the fee if they can demonstrate:

- Lead was not present at the place of employment during the prior calendar year [section 38002(a)(1)]; or
- Lead was present at the place of employment the prior calendar year only in a *de minimis* amount. [section 38002(a)(2)]

"De minimis amount" means any of the following [section 38001(b)]:

- Lead present in materials which are altered or disturbed and have a lead concentration less than 0.5% (5000 ppm) by weight;
- Lead present in materials where the total weight of such materials altered or disturbed during the calendar year is known to be 16 ounces (one pound) or less by weight;
- Lead present in materials where no such material is altered or disturbed at any individual employee's place of employment on more than one day during the calendar year, i.e., if no employee works on more than one day during the calendar year in any location where lead-containing materials are being altered or disturbed, then the amount is de minimis.

Also, if these businesses employ less than 10 persons in the previous year, they are exempt from the fee. However, "Painting and Paper Hanging" [section 38002(c)] and "Wrecking and Demolition Work" [section 38002(d)] businesses are not exempted by this 10 employee or less criteria if, in the operation of the employer's business in the prior calendar year, any employee altered or disturbed paint in or on a building constructed prior to 1978 or on a painted metal structure, unless the employer demonstrates that lead was not present in any of the altered or disturbed paint, or was present only in a de minimis amount.

Denial of Fee Waiver Request

An employer's request for a fee waiver may be denied for any of the following reasons:

- Identification of the presence of lead in a greater than de minimis amount at the place of employment or in the materials or processes used in the operation of the employer's business; or

- Failure of an employer to request a fee waiver and supply the documentation required in Section 38003(d) within 180 days following the due date of the Occupational Lead Poisoning Fee; or
- Failure of an employer to provide sufficient and accurate information by which to evaluate the request for a fee waiver.

Fee Waiver Application Procedure

A Request for a Waiver of the Occupational Lead Poisoning Fee Form 8484 (4/97) may be obtained from the California Department of Health Services. The form is self-explanatory; however, businesses need to:

- Conduct a lead evaluation of the premises, materials and processes used in the operation of the employer's business during the prior calendar year to determine whether lead was present.
- If lead was present, it must not exceed de minimis amount.
- The request for fee waiver must be filed within 180 days following the due date of the Occupational Lead Poisoning Fee.

Setting Up an Injury & Illness Prevention Program

Every California employer must have a written Injury and Illness Prevention Program (IIPP), and a copy must be maintained at each workplace or at a central worksite if the employer has mobile worksites. The requirements for establishing, implementing, and maintaining an effective written Injury and Illness Prevention Program are contained in Title 8 of the California Code of Regulations, Section 3203. The requirements consist of the following eight elements:

- Responsibility
- Compliance
- Communication
- Hazard Assessment Accident/Exposure
- Investigation
- Hazard Correction
- Training and Instruction
- Record Keeping

This chapter does not discuss all eight elements in detail. We briefly discuss below Responsibility, Communication, Hazard Assessment and Hazard Correction.

There is much evidence that having a joint labor/management safety committee that identifies and corrects hazards will reduce work-related injury costs.

Responsibility

A person must be designated as having overall responsibility for administering the IIP Program. With small companies, it is most often the owner.

Supervisors are also responsible for implementing and maintaining the IIP Program in their work areas and answering worker questions about the program. Each supervisor should have a copy of the program.

Communication

Employers are responsible for communicating with all employees about occupational safety and health in a form readily understandable by all workers. A good communication system encourages workers to inform management about workplace hazards without fear of reprisal. Make sure that an employee understands the safety and health requirements before you assign him or her to duties that involve workplace hazards.

A good communication system should include the following:

- Orientation for new workers covering health and safety policies and procedures.
- Review of IIP Program.
- Training programs.
- Regularly scheduled safety meetings.
- Effective communication of health and safety concerns between the employer and workers, communicating in a language and literacy level that employees understand.
- Posted or distributed safety information.
- A system for workers to inform management anonymously about job hazards.
- If you have less than ten employees, you can communicate with employees orally about safe work practices that affect all of them. You can also communicate individually with workers about hazards unique to each job assignment.

Hazard Assessment

Periodic inspections to identify and evaluate workplace hazards need to be performed by a competent person:

- When the IIPP is first established.
- When new substances, processes, procedures, or equipment that present potential new hazards are introduced onto the jobsite.
- When new, previously unidentified hazards are recognized.
- When injuries or illnesses occur (for example, if an employee has a high blood lead level).
- When new employees or reassigned employees are performing operations or tasks for which a hazard evaluation has not been previously conducted.
- Whenever jobsite conditions warrant an inspection.

Hazard Correction

Unsafe or unhealthy work conditions, practices, or procedures should be corrected in a timely manner based on the severity of the hazards.

- Hazards should be corrected when observed

Example— Improper Practices Expose Workers

A Bay Area residential and commercial painting contractor recently found out about the hazards of lead paint and the Cal/OSHA Lead in Construction Standard the hard way.

His crew of four painters were doing surface preparation work on a house in the East Bay. They were using a combination of power sanding, open flame propane burning, hand scraping, and sanding to prepare a house for painting. The workers were wearing paper dust particle masks available at painting and hardware stores. They wore coveralls over their street clothes. This house was similar to several other recent jobs.

After several days on the job all four workers began to complain of headaches. Aspirin was passed out to relieve the symptoms. One worker decided he needed to see a doctor since his symptoms wouldn't go away. He visited the emergency room of a local hospital. A doctor familiar with the symptoms of lead poisoning asked the worker about the type of work he did and decided that the worker should have his blood tested for the amount of lead in it. The test results showed that the worker had a blood lead level of 52 μg/dl (micrograms of lead per deciliter of blood). This is high and indicated the worker was lead poisoned.

The worker told the contractor of the test results but the contractor didn't take any action to change the way the work was being done. The worker decided to call Cal/OSHA because of his concern about lead exposure on the job.

This phone call resulted in a visit to the job site by a Cal/OSHA compliance officer. The contractor was informed of the Lead in Construction Standard and what protections were necessary. He was also informed that the employee with a blood lead level of 52 mg/dl

or discovered.
- When an immanent hazard exists and cannot be immediately abated without endangering employee(s) and/or property, all exposed workers except those necessary to correct the existing condition should be removed from the site. Those workers needed to correct the hazardous condition must be provided with the necessary protection.

Fulfilling the Hazard Communication Requirements

Besides disturbing lead paint, workers might also work with other hazardous materials such as solvents and caustics. Under the Hazard Communication regulation (Title 8, California Code of Regulations, Section 5194 and Construction Safety Orders Section 1528(b), employers must provide information to employees about the hazardous substances they may be working with. This is called "right-to-know" information.

Right-to-know Information

Employers must provide hazard and protection information about the materials your employees work with and about any materials that are being disturbed (see box on the next page). This information is available from labels, warning signs, and Material Safety Data Sheets (MSDSs). A MSDS provides warnings about:

- Health hazards.
- What is contained in the material.
- Whether it will easily catch fire or explode.
- What protection employees should be using.
- What to do if there is a spill or a leak.

Employees have a right to see an MSDS for any material they are working with. Employers are required to make an MSDS available to them. The **Appendix** has MSDS for **lead painted building debris (page 298)** and **asbestos (page 299)**.

Things to keep in mind about MSDSs:

- They are often poorly written.
- They sometimes have incomplete information.
- Surveys have found that 40 percent (40%) of the information in an MSDS cannot be understood.

Employers must not rely solely on passing out a MSDS as a way to communicate about a material to employees. Employers need to discuss the material and what the MSDS has to say at brief "tailgate" meetings. Employers may need to find other easier-to-understand materials.

If a job disturbs paint that may contain lead, there is not an MSDS on this situation. However, both employers and workers need to know whether lead is present and at what concentration. The solution here is to do paint chip sampling and analysis. This way you can find out if the paint contains lead and what the concentration of lead is in the paint. Then discuss with the crew the laboratory findings and what protections are needed before the job begins. This procedure helps fulfill the IIPP, Hazard Communication, and Cal/OSHA lead in construction obligations.

Medical Surveillance

Medical surveillance is an employer-sponsored program to monitor the health of workers, with special attention to any worker who becomes ill or has an abnormal test result. A Medical Surveillance Program is required by the Cal/OSHA Lead in Construction Standard and helps an employer answer the question, "Am I protecting my employees from lead poisoning?" The program must be supervised by a qualified physician, in collaboration with the employer, and includes:

- Biological monitoring (blood testing).
- Lead-specific medical evaluation, and treatment if needed.
- Information given to workers about their test results and the health effects of lead.
- Removal of worker from lead exposure if health is at risk.
- Medical clearance for respirators (if used).

The Importance of Medical Surveillance

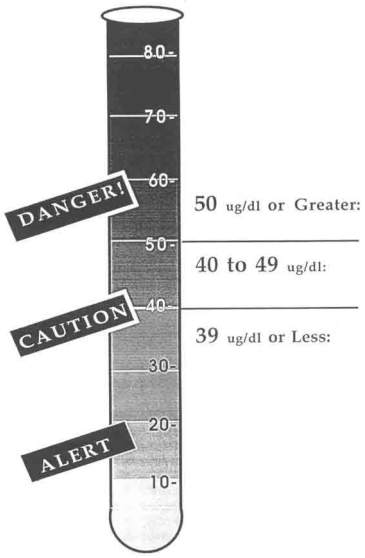
Medical surveillance provides employers with important information that helps them protect employees and their business. A good medical surveillance program will:

- Identity employees with higher exposure to lead.
- Detect early stages of ill health in an employee.
- Guide exposure control efforts.
- Educate employees on how to avoid lead exposure.

Early detection of overexposure to lead can alert employers to uncontrolled hazards and prevent the need for payment of wages and benefits for temporary removal of a lead-poisoned employee, workers' compensation claims, and other costs.

Measuring Lead in the Blood

The two blood tests used to measure the amount and effect of lead exposure are Blood Lead Level (BLL) and Zinc Protoporphyrin (ZPP). Periodic testing of BLL and ZPP is called *biological monitoring* and is required by the Cal/OSHA lead in Construction Standard at specific, minimum intervals. Both tests can be done on the same blood sample and are reported in units of micrograms per deciliter (μg/dl). An OSHA-approved laboratory must do BLL analysis for workers.



- Blood Lead Level (BLL) is the single best diagnostic test for lead exposure and reflects the amount of lead currently found in the blood and soft tissues. This may be from recent external exposure (inhalation and/or ingestion) as well as from the slow release of any lead stored in bones from past exposures. When interpreting a person's BLL, it is important to consider whether the exposure is short- or long-term, recent or past, high or low. The typical BLL for adults in the United States is less than 3 μg/dl.

- Zinc Protoporphyrin *(ZPP)* measures a protein in the blood that increases when lead interferes with the ability of red blood cell to make hemoglobin (the oxygen carrier in the blood). ZPP begins to rise when the BLL reaches 20 to 50 μg/dl and shows that lead is affecting the body. An elevation in ZPP usually lags behind an increase (and decrease) in BLL by two to six weeks. Most adults with little or no lead exposure have a ZPP level of 50 μg/dl or less.

Together the BLL and ZPP give important information regarding lead exposure. For example, if a worker has an elevated BLL and a normal ZPP, this would suggest a recent exposure. Other laboratory tests required by the Cal/OSHA lead standard are useful in evaluating the effects of lead exposure on the body. These tests provide important information before and during work with lead. If a respirator is used, a full respiratory protection program must be implemented. A medical evaluation is needed in addition to fit testing.

Using Medical Monitoring Information

Laboratory tests are an essential part of a lead safety program. The physician who supervises the program ("medical supervisor") should collaborate closely with the employer. A high BLL, or an increase since the last test, indicates a person is breathing or swallowing too much lead. The clinician looks at this together with other evaluation, the patient's medical history and history of lead work. The clinician then determines the patient's risk of health damage.

Because of the nature of construction work, there is no single fixed schedule of BLL and ZPP testing that makes sense for all contractors. An initial BLL and ZPP done prior to starting the job provides important baseline information before potential exposure begins. Subsequent BLL tests will primarily reflect recent exposure to lead. It is helpful to do BLL and ZPP testing during the highest exposure work periods to detect rises early enough to prevent serious problems.

Discuss this with your medical supervisor to determine the best schedule for your workers. The Cal/OSHA Lead in Construction Standard requires BLL

and ZPP testing at least every 6 months after initially testing every 2 months for the first 6 months.

The employer can use the BLL and ZPP results to identity certain types of jobs or specific tasks that are at higher risk for lead exposure. A high BLL, or an increase since the last test, indicates that a person is inhaling or swallowing too much lead. In addition to reviewing individual BLL and ZPP results, it is important to group results by crew, area of the work site, task or process. Look for patterns to identity work areas or tasks associated with high exposure and implement better ways to control exposure. This kind of evaluation can prevent costly, unnecessary problems for both the employer and the employees by allowing early detection and correction of hazardous exposures.

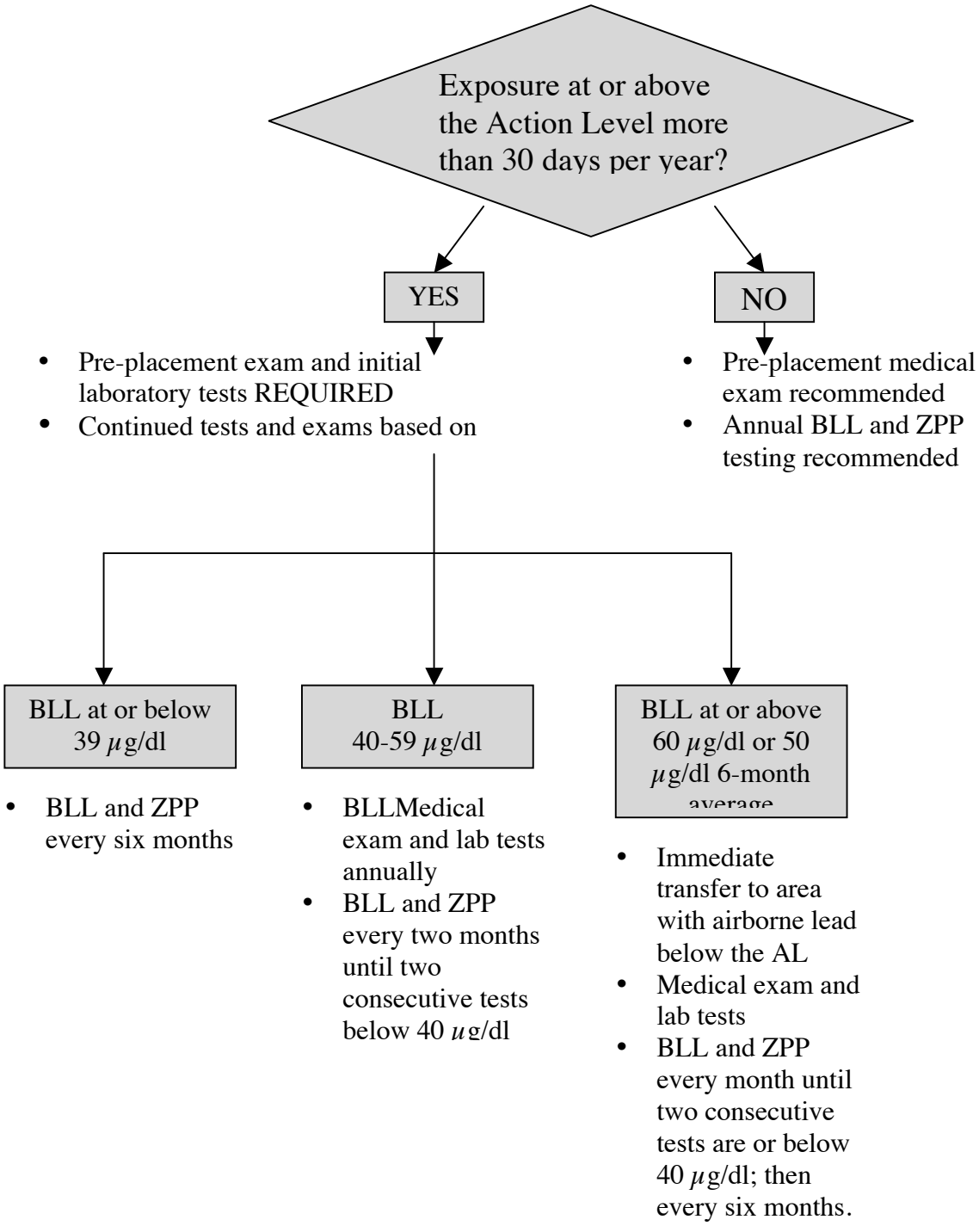
To identity and control hazards, talk with job supervisors and workers, and review the following questions:

- What kind of work methods and materials have workers been using? Can they switch to methods that better control the amount of lead dust or fume produced?
- Do respirators fit properly? Are they being maintained and worn properly? Is the level of respiratory protection high enough?
- Are workers consistently practicing good housekeeping and hygiene?

You can make needed improvements and then do follow-up BLL and ZPP testing to see if changes have been effective. Aim to keep all workers' BLLs as low as possible, preferably under 10 μg/dl.

The following two charts help you make the decision as to when and how much Medical Survellance is required.

Flow Chart— Medical Surveillance Requirements



Table— Construction Industry Cal/OSHA Lead Standard Medical Surveillance
Title 8, California Code of Regulations, §1532.1 Schedule for Required Medical Services

CATEGORY OF LEAD- EXPOSED EMPLOYEE	**MEDICAL EVALUATION**	**LABORATORY TESTING**
New employees or those newly assigned to lead work who are performing a specific trigger task* or who are exposed to airborne lead at or above 30 μg/m^3** for 1 to 30 days per year, and prior BLL, if known, is below 40 μg/dl. **	Medical clearance to wear respirator, if used—applies to all categories.	Blood lead level (BLL) and Zinc protoporphyrin (ZPP).
New employees or those newly assigned to work with airborne exposure at or above 30 μg/m^{3}for more than 30 days per year and prior BLL, if known, is below 40 μg/dl.	Same as above.	BLL and ZPP Repeat every 2 months for 6 months, then every 6 months thereafter.
Blood lead level 40 to 49 μg/dl	Annually: General and lead- specific history and physical exam with special attention to hematological, neurological (central and peripheral), pulmonary, cardiovascular, gastrointestinal, musculo-skeletal, renal, and reproductive systems.	Complete lab panel BLL, ZPP, CBC with red cell indices and peripheral smear, serum creatinine, BUN, complete urinalysis, sperm analysis or pregnancy test if employee requests. Any other tests the physician deems necessary. Repeat BLL and ZPP every 2 months until 2 consecutive BLLs are

CATEGORY OF LEAD- EXPOSED EMPLOYEE	MEDICAL EVALUATION	LABORATORY TESTING
		below 40 μg/dl.
Blood lead level 50 μg/dl or greater - Medical Removal Protection (MRP) required***	As soon as MRP initiated (see above).	Complete lab panel (see above). Repeat BLL and ZPP at least monthly until 2 consecutive BLLs are at or below 40 μg/dl.
Reports signs/symptoms of lead toxicity, desires advice about effects of lead exposure (on reproductive system, child bearing, etc.), has increased risk of material impairment to health due to lead exposure, or has difficulty breathing with respirator use.	As soon as possible (see above).	As deemed appropriate by the physician based on individual case needs.

* Title 8, California Code of Regulations, Section 1532.1 (d)(2)
** μg/m^3=micrograms of lead per cubic meter of air; μg/dl= micrograms of lead per deciliter of whole blood;
*** MRP is the required removal of an employee from work with lead exposure, with full salary and benefits, until there are 2 consecutive BLLs of 40 μg/dl or below and the physician authorizes return to the usual work.

Requirements for a Medical Surveillance Program

Medical surveillance has three basic parts—medical evaluation, ongoing periodic laboratory testing (biological monitoring), and intervention to prevent exposure where identified.

A licensed physician must supervise the Medical Surveillance Program. When choosing a physician to be the company's medical supervisor, the employer should look for someone who is familiar with the Cal/OSHA lead in Construction Standard and has training and experience in caring for lead-exposed workers. Some physicians who specialize in occupational medicine are board certified by the American Board of Preventive Medicine.

A formal contract between the employer and physician detailing mutual responsibilities is strongly recommended. To find a qualified physician, you may contact any of the seven University of California Occupational and Environmental Health Clinics for direct service or possibly a referral in your community. Other options include asking other business owners for recommendations or looking in the phone book *Yellow Pages* under headings for *Physicians: Occupational Medicine* or *Industrial Medicine*.

The employer is responsible for providing the physician with information about all employees exposed to lead, the nature of their work and the requirements of the Cal/OSHA lead in Construction Standard.

The flow chart and table on the previous page outlines the Cal/OSHA requirements for a lead Medical Surveillance Program in the construction trades.

Medical Removal Protection (MRP)

The employer is required by Cal/OSHA to remove an employee from lead exposure if the employee's BLL is 50 μg/dl or above. This is called Medical Removal Protection (MRP). The purpose is to prevent further exposure to lead. The medical supervisor must evaluate the employee as soon as possible. The physician may allow the employee, if physically able, to return to work in an area free of lead exposure while on MRP. If no lead-free work is available, the employee must be temporarily off work with full pay and benefits.

Whenever an employee is placed on MRP, the frequency of biological monitoring must be increased to at least once a month. After two consecutive BLLs are at or below 40 μg/dl, the physician can recommend to the employer that the employee return to the previous work if the employer has taken steps to control lead exposure and the employee's symptoms or any other clinical manifestation of toxicity have resolved. It is recommended that these blood tests be done at least one month apart to help reduce the lead body burden.

A physician can remove an employee with a BLL below 50 μg/dl based on relevant medical findings in individual cases, such as signs or symptoms of lead toxicity regardless of BLL, pregnancy, or target organ damage (e.g., kidneys, brain). Lead is easily passed from a pregnant woman to her fetus. Ideally, a woman who is planning to conceive or is pregnant should keep her BLL below 10 μg/dl. To maintain a BLL below 10 μg/dl, work duties may need to be modified. Employees, male or female, who have reproductive concerns, may want to consult a physician on this issue.
An employee who has been removed may return to the former job, with proper protection, when a follow-up medical decision indicates that he or she no longer has a medical condition that places the employee at increased risk of health damage from exposure to lead.

MRP Benefits

MRP benefits mean providing the employee's normal earning, seniority, and other employment rights and benefits when removed from the job for lead exposure. Cal/OSHA requires the employer to provide these benefits as long as the job from which the employee was removed continues, up to a maximum of 18 months. If the physician determines that the employee is physically able, you can assign him or her to alternate work that does not involve lead exposure. The employee is still entitled to full wages and benefits. If workers' compensation disability benefits are used to pay a portion of the salary, the employer is responsible for paying the balance. Upon return to work, employees are guaranteed former job status.

Medical Services

Medical services must be provided at no cost to the employee and scheduled at a reasonable time and place. The evaluation and services must be carried out in the employee's language. An employee is entitled to a second medical opinion by a physician of the employee's choice regarding the lead medical evaluation, at the expense of the employer. If necessary, a third physician many be requested to resolve disagreement between the first two.

Notification of Results

The employer must notify the employee of his or her BLL and ZPP results in writing within 5 working days after receipt. An easy-to-use form titled **"Understanding Your Blood Lead Level (BLL) Test" in English (pages 300-301), Spanish (pages 302-303),** and **Chinese (pages 304-305)** is provided in the **Appendix**. Simply make copies and fill in the employee name, date, and results.

Chelation

The routine use of chelation drugs (such as EDTA, Succimer, etc.) to lower BLLs in persons who continue to be occupationally exposed to lead is strictly prohibited.

Record Keeping

All medical records related to lead exposure are considered confidential. Employers are required to establish and maintain records of medical surveillance. These include employees' names, the physician's written opinion, exposure data provided to the physician, and any employees' medical complaints associated with lead exposure. You or the examining physician are required to keep a record of all examination results. An employer is not entitled to personal medical information about an employee.

Records must be kept for at least the duration of employment plus 30 years. Medical records of employees who have worked for less than one year need not be retained by the employer if they are given to the employee upon termination of employment. Records must be made available to employees, their authorized representatives, their physician, or any other person designated in writing by a current or former employee.

When an employer ceases to do business, the records should be transferred to a successor employer. If there is no successor employer, these records must be transmitted to NIOSH.

For More Information

Details of the requirements for lead medical surveillance are in the Cal/OSHA Lead in Construction Standard. Two OLPPP publications- *Medical Guidelines for the Lead-Exposed Worker* and *A Model Contract*-are available for employers and physicians to assist in understanding and establishing an lead medical program. For free copies of OLPPP publications call (510) 622-4332. LEAD POISONING IS PREVENTABLE!

Safety Training for Workers

An important way to prevent workplace injuries and illnesses is to educate and train workers about health and safety issues on the job. The Occupational Safety and Health Administration (OSHA) requires comprehensive training to protect workers against all the hazards they face.

Safety training for workers is one key to making a jobsite safer. Just as a contractor would be expected to provide the right tool for the right job, so they would be expected to provide safety training on doing the job safely.

The purpose of training is not only to provide workers with information to protect themselves and to work safely, but also to increase workers' awareness of health and safety conditions and to promote worker action to address these problems.

It is important to use the information you know about your company (for example— blood lead testing results, tasks performed, and air monitoring results)— to tailor your company's training.

Basic Training Requirements (Cal/OSHA)

Important Points To Keep in Mind

The Cal/OSHA lead in Construction Standard has two levels of training requirements. There is a basic level of training for all exposed employees. In addition, there is a certified level of training for employees shown to be exposed to lead at or above the Permissible Exposure Limit (50 $\mu g/m^3$) while working on residential and public access buildings.

For the basic level of training, the requirements do not tell an employer how long the training should be or the training method to be used (for example, lecture vs. hands-on demonstrations). However, the employer must ensure that employees know what the hazards are, the protections needed, and how to work safely. The HUD basic course leading to a "Notice of Completion" fulfills the EPA requirement. The certified level of training is described later in this chapter.

Who Must Be Trained?

All employees who:

- Perform any of the specified trigger tasks.
- Are exposed to lead at or above the Action Level (30 $\mu g/m^3$ or 30 micrograms per cubic meter) on any day.
- Are exposed to lead compounds that cause eye or skin irritation.
- Are exposed to an unknown level of lead.

How Often Must Training Occur?

- Prior to the time of a job assignment that involves lead exposure
- At least **annually** for each employee who is subject to lead exposure at or above the Action level on any day, or if the level of lead is unknown.

Is Time Off for Training Compensable?

- Employees must be paid their wages while taking this training. (Safety training is part of a condition of employment and, by law, employees must be paid for this time.)

Employee Information and Training

Training must include:

- The content of the lead in Construction Standard and appendices.
- The operations that may cause lead exposure above the Action level.

- The purpose, proper selection, fitting, use, and limitations of respirators.
- The purpose and description of the Medical Surveillance Program and the Medical Removal Protection Program.
- The adverse health effects of lead exposure (including the effects on reproduction, for both males and females).
- The engineering controls and work practices relevant to the employee's job assignment.
- The contents of any compliance plan in effect.
- The prohibition against routine use of chelation agents.
- The employee's right of access to records under Title 8 CCR, Section 3204.

Access to information and training materials

The employer must:

- Make available to all affected employees a copy of the lead in Construction Standard and its appendices.
- Provide, upon request, all materials relating to the employee information and training program to the employees and their designated representatives.

The purpose of the certified level of training is to ensure that there is an adequately trained workforce to do high lead exposure work safely and to protect residents of residential and public access buildings.

Special Training (Title X — Sections 402(a) and 404(d))

Title X, section 402 (a) and 404 (d), required EPA to issue specific requirements for appropriate training and certification of contractors, workers, supervisors, inspectors, and risk assessors involved in lead-based paint hazards. In response to this mandate, EPA developed, "Lead; Requirements for Lead-Based Paint Activities in Target Housing and Child-Occupied Facilities" (40 CFR Part 745). The regulation also contains standards for performing lead-based paint activities. These requirements were published in final August 1996. The rule is intended to ensure that individuals conducting lead-based paint inspections, risk assessments, and *abatements* in target housing and child-occupied facilities are properly

trained and certified, and that training programs providing instruction in those activities are properly accredited. This rule establishes specific training course content, model curricula, certification requirements, and work practice standards for the following lead disciplines:

- Inspector
- Risk Assessor
- Project Designer
- Abatement Worker
- Abatement Supervisor

California, through the Department of Health Services, has established State regulations for certifying the above disciplines. It requires training in accredited programs and subsequent certification by DHS of workers who perform abatement and other high-risk lead-related construction work such as any alteration, painting, demolition, salvage, renovation, repair, maintenance, preparation, and cleanup that may result in significant exposure of adults or children to lead. There are five categories of certification with different training and experience requirements: Lead Worker, Lead Supervisor, Lead Project Monitor, Lead Project Designer, and Lead Inspector/Assessor.

Title X defines abatement as, "any measure or set of measures designed to permanently eliminate lead-based paint hazards." Abatement does not include, "renovation, remodeling, landscaping or other activities, when such activities are not designed to permanently eliminate lead-based paint hazards, but, instead, are designed to repair, restore, or remodel a given structure or dwelling, even though these activities may incidentally result in a reduction or elimination of lead-based paint hazards. Furthermore, abatement does not include interim controls, operations and maintenance activities, or other measures and activities designed to temporarily, but not permanently, reduce lead-based paint hazards."

Therefore, you are not required to be certified if you are not doing "abatement" as directed by this regulation. Under this rule, the EPA issued a model-state certification program to help states set up their own programs. A State may choose to adopt the model program or create a program of their own.

Who Must Be Trained and Certified?

As required by the Cal/OSHA lead in Construction Standard and the California Department of Health Services (CDHS) Title 17, CCR Division 1, Chapter 8 regulations, workers and supervisors must be trained and certified when they meet the following criteria:

- They are working on residential and public access buildings (public buildings are defined as any structure generally accessible to the public, including but not limited to schools, daycare centers, museums, airports, stores, office buildings and any other building which is not an industrial or residential building).

and

- Their exposure to lead has been shown to be at or above the Permissible Exposure Limit (50 $\mu g/m^3$).

Other situations that require workers and supervisors to be trained and certified include:

- When abating existing lead risk factors in California public elementary and preschools and public day care facilities (Lead-Safe Schools Protection Act).
- When performing intentional lead abatement designed to reduce/eliminate lead hazards in residential and public buildings (Title 17, CCR Division 1, Chapter 8).
- When performing lead abatement on U.S. Department of Housing and Urban Development (HUD) funded projects (Federal Title X).
- When the contract specifications require it.

California Department of Health Services' Certification Program

As stated above, the California Department of Health Services (CDHS) has regulations and a program to ensure that specified people who work in lead-related construction are trained and certified. These regulations are entitled "Title 17, CCR Division 1, Chapter 8, Accreditation, Certification and Work Practices in lead-Related Construction."

The CDHS Accreditation and Certification Unit (in the Childhood lead Poisoning Prevention Branch) certifies workers and supervisors that have completed approved training and meet all certification requirements. (They also certify inspector/assessors, project designers, and project monitors). This CDHS Unit also accredits (approves) training providers that meet the requirements of the regulations to offer lead-related construction training.

To become certified:

- Individuals must be trained by a CDHS accredited (approved) training provider.
- Workers take a 24-hour training (there is no exam, no experience or education requirements).
- Supervisors take a 40-hour training and exam; and must have one year as a certified lead worker or two years of health and safety work in construction or in a related field or hold certain Contractors State License Board licenses.
- Workers and supervisors complete an application and apply for certification.
- For questions about training and certification requirements, a current list of accredited training providers, application forms and other information, contact CDHS/CLPPB at 1(800) 597-5323 or visit www.childlead.com

Cal/OSHA's role in the Certification Program

As required by legislation, Cal/OSHA has folded in the CDHS training and certification requirements into the Cal/OSHA Lead in Construction Standard training section. Contractors therefore need to know the following information:

- CDHS's Accreditation and Certification Unit manages the actual program (direct all related questions to this program at 1 (800) 597-5323 or visit www.childlead.com).
- Cal/OSHA enforces the certification training requirements on construction job sites (as part of the Cal/OSHA lead in Construction Standard).
- Cal/OSHA compliance officers can cite and fine employers for not having their supervisors and workers certified when lead exposures

are at or above the Permissible Exposure Limit (50 μg/m^3) while working on residential and public access buildings.
- If supervisors and workers are certified, they should keep their CDHS certification card in their wallet. Employers should keep their own copies as well.

Compliance Plan

OSHA requires employers develop a lead compliance plan to state how they intend to comply with the lead requirements. Employers must list in writing all the methods used to reduce employee exposure to lead. This is called a "Compliance Program." A compliance program includes various work practices and engineering controls designed to reduce employee exposure to lead. Some employers do not have the knowledge to do this and should hire an industrial hygiene firm or a certified industrial hygienist (CIH). The plan must include an initial exposure determination. Examples of these types of controls would be:

- Initial exposure determination
- Using materials or tools that make less lead dust or fumes.
- Changing the way you do a job so you create less dust.
- Rotating schedules so worker exposure to lead is less.
- Providing you with a respirator and protective clothing.

Details of the Compliance Plan as related to lead are present in other chapters. A step-by-step Compliance Plan in presented in Section 4.

Key Facts

Occupational Lead Poisoning Prevention Program (OLPPP)

General Contractors must register and pay a fee to OLPPP (division of California Department of Health Services) using Fee Form 8484 if they are involved in:

- Single-family houses
- Plumbing, heating, air conditioning
- Painting and paper hanging
- Roofing, siding and sheet metal work
- Wrecking and demolition work
- Others.

Fee can be waived if:

- Lead not present at place of employment during prior calendar year
- Lead was present at place of employment but below "de minimis" amount.

  "De minimis" is defined as:

  - Lead materials that are altered or disturbed have lead concentrations less than 0.5% (5000 ppm) by weight.
  - Within one calendar year, one pound or less of lead-containing materials are altered or disturbed.
  - Within one calendar year, employees work for 1 day or less at any location where lead-containing materials are being altered or disturbed.
- Business has less than 10 employees. Exceptions are made for business that perform (1) Painting and Paper Hanging, (2) Wrecking and Demolition Work. These two categories of business are not exempt by the 10 employee rule if any employee altered or disturbed paint in or on a building constructed prior to 1978 or on a painted metal structure or lead was present above the de minimis amount.

Injury and Illness Prevention Program (IIPP)

Title 8 of the California Code of Regulations, Section 3203 requires every California employer to implement an Injury and Illness Prevention Program (IIPP) with the following eight elements:

- Responsibility
- Compliance
- Communication
- Hazard Assessment Accident/Exposure
- Investigation
- Hazard Correction
- Training and Instruction
- Record Keeping

Hazard Communication Program

Title 8, California Code of Regulations, Section 5194 and Construction Safety Orders Section 1528(b) requires employers to provide information to employees about the hazardous substances with which they may be working.

Every employee has the right to see:
- Labels
- Warning Signs
- Material Safety Data Sheets (MSDSs).

Employers must not rely solely on passing out an MSDS as a way to communicate about a material to employees because MSDS are:
- Often poorly written
- Have incomplete information
- 40% of the information cannot be understood

Employers need to discuss the material and what the MSDS has to say at brief "tailgate" meetings.

Medical Surveillance Program

Required by the Cal/OSHA Lead in Construction Standard.

Must be supervised by a qualified physician.

Includes:
- Biological monitoring (blood testing).
- Lead-specific medical evaluation, and treatment if needed.

- Information given to workers about their test results and the health effects of lead.
- Removal of worker from lead exposure if health is at risk.
- Medical clearance for respirators (if used).

Medical Surveillance is required when:

- Workers are exposed to airborne lead at or above the Action Level of 30 $\mu g/m^3$ for more than 30 days in any consecutive 12-month period.

Cal/OSHA requires "base-line" medical tests (BLL and ZPP) when:

- Employees begin lead work (at any exposure level).
- The level or airborne lead is unknown. The Lead in Construction standard requires the presumption of lead above the Action Level until proven otherwise.
- Workers are exposed at or above the Action Level for even one day.
- Workers engage in "trigger" tasks.

Additional medical tests are required:

New employees or those newly assigned to work with airborne exposure at or above 30 $\mu g/m^3$ for more than 30 days per year and prior BLL, if known, is below 40 $\mu g/dl$.	• Medical clearance to wear respirator. • BLL and ZPP Repeat every 2 months for 6 months, then every 6 months thereafter.
Blood lead level 40 to 49 $\mu g/dl$	• Annual general and lead- specific history and physical exam • Complete lab panel BLL, ZPP, CBC with red cell indices and peripheral smear, serum creatinine, BUN, complete urinalysis, sperm analysis or pregnancy test if employee requests. Any other tests the physician deems necessary. • Repeat BLL and ZPP every 2 months until 2 consecutive BLLs are below 40 $\mu g/dl$.
Blood lead level 50 $\mu g/dl$ or greater - Medical Removal Protection (MRP) required	• Complete lab panel (as above). • Repeat BLL and ZPP at least monthly until 2 consecutive BLLs are at or below 40 $\mu g/dl$.

Blood Tests

- Blood Lead Level is the single best diagnostic test for lead exposure.

- Zinc Protoporphyrin *(ZPP)* measures a protein in the blood that increases when lead interferes with the red blood cell's ability to make hemoglobin. ZPP lags 2 top 6 weeks behind BLL changes.

- Worker with elevated BLL and normal ZPP would suggest a recent exposure to lead.

Medical Removal Protection (MRP)

- BLL above 50 μg/dl require employees to be removed from their job (Medical Removal Protection (MRP)).
- Employee must be biologically monitored every month until two consecutive BLLs are at or below 40 μg/dl.
- During this time, the employee must receive full salary, no loss in seniority or other employment rights and benefits up to a maximum of 18 months.
- If a physician determines that the employee is physically able, he or she can be assigned alternate work that does not involve lead exposure.

These services must be provided at:

- no cost to the employee
- in the employee's primary language
- scheduled at a reasonable time and place
- with the opportunity for a second medical opinion paid by the employer
- results must be made available to employee in writing within 5 days after receipt of the results.

Chelation

The routine use of chelation drugs (such as EDTA, Succimer, etc.) to lower BLLs is strictly prohibited.

Records

- All medical records are confidential.
- Employees have the right to review all medical records.
- Employers must retain medical records for the duration of employment of employees plus 30 years.
- If an employer ceases to do business, the records should be transferred to a successor employer.
- If there is no successor employer, these records must be transmitted to NIOSH.

Employee Safety Training Program

OSHA requires comprehensive training to protect workers against all hazards they may face.

Basic Training

Employees must receive basic training (such as this course) if they:

- Are exposed to an unknown level of lead.
- Are exposed to lead compounds that cause eye or skin irritation.
- Are exposed to lead at or above the Action Level (30 μg/) on any day.
- Perform specific trigger tasks.

Employees must receive:

- Training prior to the time of a job assignment that involves lead exposure.
- Training at least annually if subject to lead exposure at or above the Action Level on any day or for an unknown level of lead.
- Full wages while taking training.

Special Training

Workers must receive special training leading to a state certificate if they:

- Work on residential or public access buildings and are exposed to lead above the PEL (50 $\mu g/m^3$).
- Engage in lead abatement in residential property, public buildings, or HUD funded projects.
- When the contract specifications require certified workers.

Special training is beyond the scope of this course.

Compliance Program

OSHA requires employers develop a lead compliance plan to state how they intend to comply with the lead requirements.

Plan must contain:

- Initial exposure determination.
- How to use materials or tools make less lead dust or fumes.
- Schedules to rotate workers so as to reduce lead exposure.
- Respirator and protective clothing for employees.

CHAPTER 7— Lead-PRE Disclosure and Assessment

Besides the general programs presented in the previous chapters, there are very specific rules and regulations contractors need to be aware when working with lead-based paint and lead hazards. These include disclosure to residents and owners before work begins, and assessment before and after completion of a job.

Disclosure During Renovation and Remodeling (Title X — Section 406 (c))

Under Title X, section 406 (b), the EPA wrote regulations entitled, "Residential Property Renovation" (subpart E of 40 CFR Part 745). The final regulations were published June 1, 1998 and subsequently went into effect on June 1, 1999. It requires communication with the owner and residents about lead before work begins by distributing the EPA pamphlet, *Protect Your Family From Lead in Your Home*.

Under certain circumstances, including emergency repairs, it is not necessary to distribute the pamphlet. In an informational pamphlet about this regulation, EPA describes "emergency renovations" as: "unplanned renovations or activities done in response to a sudden, unexpected event which if not immediately attended to presents a safety or public health hazard or threatens property with significant damage." They provide two examples of emergency renovations:

- Renovations to repair damage from a tree that fell on a house
- Renovations to repair a pipe break in an apartment complex

The following information is taken from, "The Lead-Based Paint Pre-Renovation Education Rule: A Handbook for Contractors, Property Managers, and Maintenance Personnel."

Lead-Based Paint Pre-Renovation Education Rule (Lead PRE)

The Lead PRE rule is a Federal regulation affecting construction contractors, property managers, and others who perform repaires and renovations for compensation in residential housing that may contain lead-based paint. Examples of activities covered by this rule include, but are not limited to:

- Remodeling
- Plumbing
- Electrical Work
- Window Replacement
- Repair and maintenance
- Carpentry
- Painting

It applies to residential houses and apartments built before 1978 (hence the PRE designation representing Pre-1978).

Housing and activities excluded from the rule include:

- Housing built in 1978 or later
- Housing for the elderly or disabled persons (unless children will reside there)
- Zero-bedroom dwellings (studio apartments, dormitories, etc.)
- Housing or components declared lead-free by a certified inspector or risk assessor
- Emergency renovations and repairs
- Minor repairs and maintenance that disturb two square feet or less of interior paint, 20 square feet or less of paint in common areas, or less than 10% of a component.

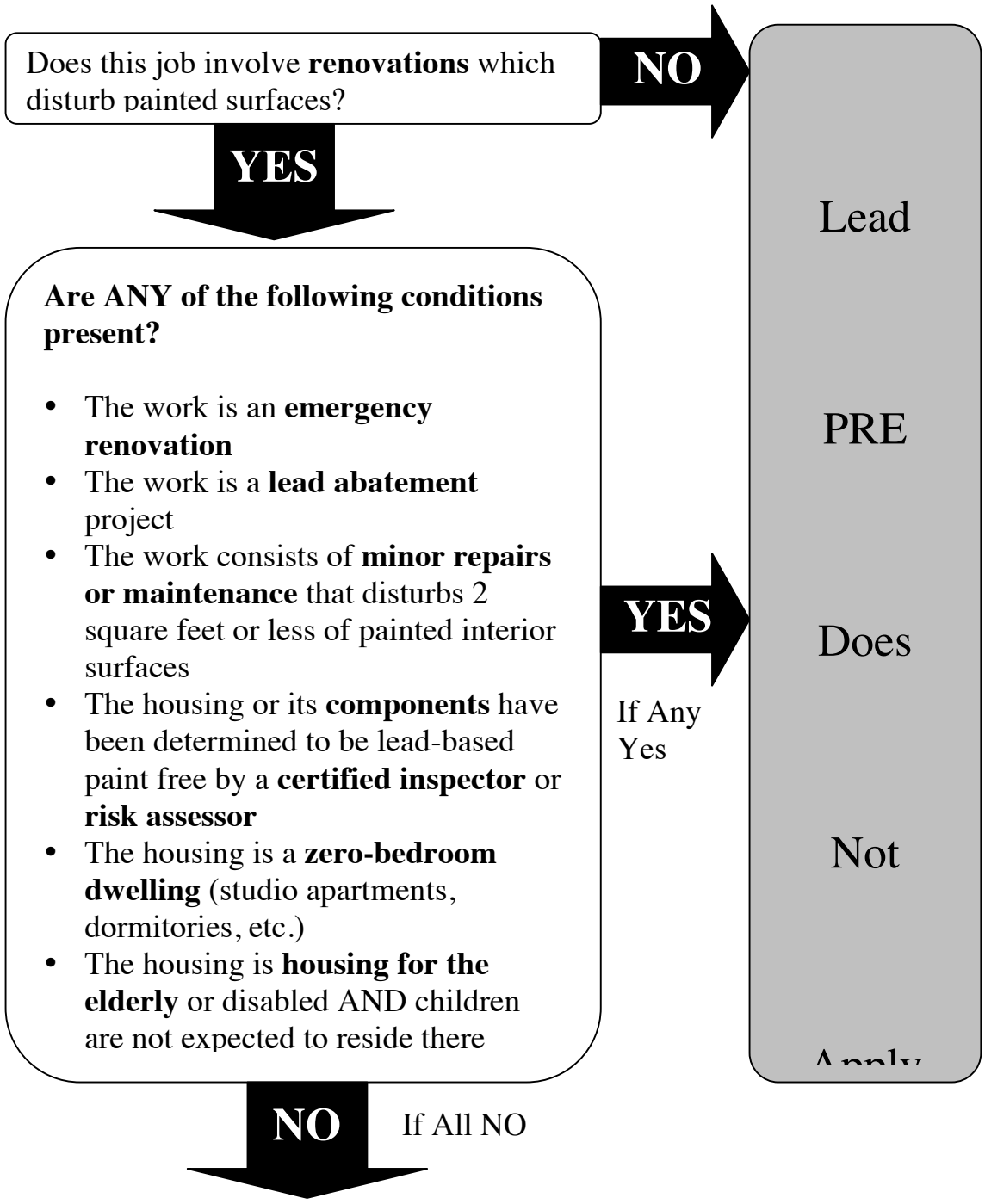
Lead PRE Requirements

The Lead-Pre regulations require:

- Distribute a lead pamphlet to the housing owner and residents before repairs or renovation begins.
- Obtain confirmation of receipt of the lead pamphlet from the owner and residents or a certificate of mailing from the post office.
- For work in common areas of multi-family housing, distribute renovation notices to tenants.
- Retain records for at least 3 years.

Lead PRE At-A-Glance

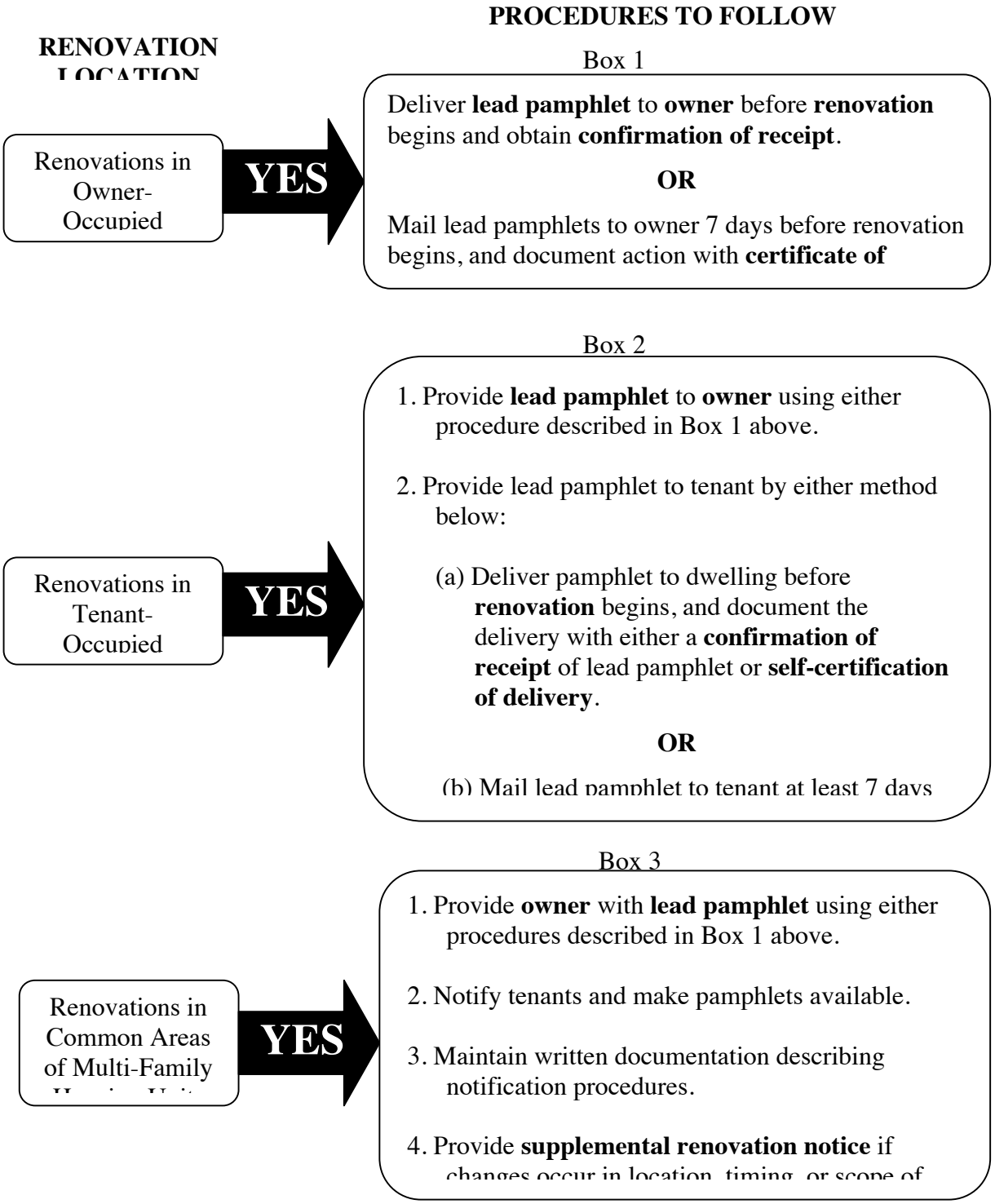
If you will be working for **compensation** in a pre-1978 home or apartment building, answer the questions below to determine if Lead PRE requires you to give the **lead pamphlet** to the **owner** and **residents**.



If no, then you need to provide the lead pamphlet.

Meeting the Lead PRE Requirements

How do I meet the Lead PRE Requirements?



For all options, keep records for 3 years after renovation is completed.

Lead PRE Special Circumstances

Is Painting considered renovation, even if no surface preparation activity occurs?
No. If the surface to be painted is not disturbed by sanding, scraping, or other activities that may cause dust, the work is not considered renovation and Lead PRE does not apply.

What if I renovate my own home?
Lead PRE applies only to renovation s performed for compensation; therefore, if you work on your own home Lead PRE does not apply.

Is a renovation performed by a landlord or employees of a property management firm considered a "compensated renovation" under Lead PRE?
Yes. The receipt of rent payments or salaries derived from rent payments are considered compensation under Lead PRE. Therefore, renovation activities performed by landlords or employees of landlords are covered.

Do I have to give out the lead pamphlet 7 days prior to beginning renovation activities?
The 7-day advance delivery requirement applies only when you deliver the lead pamphlet by mail; otherwise, you may deliver the pamphlet anytime before the renovation begins. Note, however, that the renovation must begin within 60 days of the date that the pamphlet is delivered.

Tips for Easy Compliance
- Copy and use the sample forms included in this manual.
- Attach the forms to the back of your customer renovation or repair contracts or work orders. The completed forms can be filed along with your regular paperwork.
- If a tenant is not home or refuses to sign the form, you may use the "self-certification" section of the form to prove delivery. This will reduce your paperwork.
- Plan ahead to obtain enough copies of the lead pamphlet

See the **Appendix (Confirmation of Receipt of Lead Pamphlet (EPA 406(b)) Before Work Begins** page 306**, Confirmation of Receipt of Lead**

Pamphlet (HUD Sections 1012/1013) Before Work Begins page 308**, and Renovation Notice of Common Areas** page 307) for applicable forms.

Inspection/Assessment

Lead Inspection

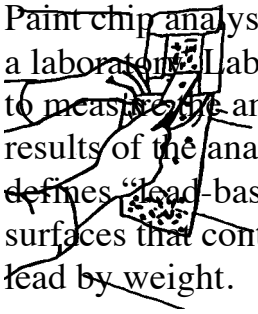
Federal law requires anyone providing lead inspection services to be properly trained and accredited by a state or federal agency. Lead "inspectors" and "risk assessors" use specific procedures to measure or sample lead in paint, dust or soil. "Risk assessors" also identify the presence of "lead-hazards," and make recommendations for correcting them. Lead levels are measured in painted surfaces, in dust, and in soils. Lead inspection/assessment is required for most HUD financed housing built before 1978 (see Chapter 9).

Measuring Lead in Paint

XRF (X-ray fluorescence) Analyzer

An XRF analyzes paint by emitting a radioactive ray. When the ray hits the paint, the paint returns energy to the XRF in the form of fluorescence. The XRF measures the returned energy and computes the amount of lead on the surface. XRF measures lead in milligrams per square centimeter (mg/cm^2). A milligram = one thousandth of a gram; one square centimeter is about the size of a thumbnail.

Paint Chip Analysis



Paint chip analysis involves scraping paint off of a surface and sending it to a laboratory. Labs generally use "Atomic Absorptive Spectroscopy (AAS)" to measure the amount of lead in the sample. The laboratory reports the results of the analysis in either mg/cm^2 or in percent lead by weight. Title X defines "lead-based paint" as any paint, varnish, shellac, or other coatings on surfaces that contains more than 1.0 mg/cm^2 of lead or more than 0.5 percent lead by weight.

Measuring Lead in Dust

Many studies have shown that lead dust is the main path of lead exposure. Lead dust is measured with dust wipe samples. The inspector or risk assessor uses moist towelettes to collect dust from a surface. Samples are taken from floors, windowsills, and window wells, then sent to a laboratory for analysis. Results for dust wipe samples are reported in micrograms per square foot. A microgram (μg) is equal to one millionth of a gram. A square foot is about the size of a square around the edges of a normal dinner plate.

In 1994, the EPA published guidelines on the levels of lead in dust. Subsequently, the Department of Housing and Urban Development (HUD) established "Clearance Levels" for the amount of lead that can be found in dust.

These levels are:

Surface HUD Levels

- Floors 100 $\mu g/ft^2$
- Window sills 500 $\mu g/ft^2$
- Window wells/troughs 800 $\mu g/ft^2$

A recently enacted federal regulation (HUD), often referred to as "Section 1012/1013," implements clearance standards which are lower than the current standards. This law went into effect September 15, 2000. The standards applies to all federally owned or subsidized housing:

Surface 1012/1013 Levels

- Floors 40 $\mu g/ft^2$ (25 if a lead hazard "screen")
- Window sills 250 $\mu g/ft^2$ (125 if a lead hazard "screen")
- Window wells/troughs 800 $\mu g/ft^2$ (only required for "clearance")

Measuring Lead in Soil

Lead in soil is a direct and indirect source of lead exposure. It is a direct source of exposure when lead from the soil gets onto the hands and then into the body through normal hand to mouth activities. It is an indirect source of exposure when it is brought into the home on shoes, clothing, or pets, contributing to levels of lead dust. Lead in soil is measured from the collection of soil samples. The samples are sent to a laboratory for analysis. The results are recorded in parts of lead per million parts (ppm) of soil. Lead becomes immobilized by the organic component of soil, so it is generally retained in the upper 2 - 5 centimeters of undisturbed soil. Urban soils and other soils that are disturbed may be contaminated to greater depths. Soil lead levels within 25 meters of roads typically exceed "natural levels" by 30 - 2,000 ppm, and some roadside soils as well as soils adjacent to houses painted with exterior lead-based paints, may have lead levels above 10,000 ppm. [(EPA). *Air quality criteria for lead*. Research Triangle Park (NC): Office of Health and Environmental Assessment, 1986; EPA report no. EPA/600/8-83/028aF.] According to the EPA, the "natural level" of lead in soil generally ranges from 5 - 50 ppm. (*Guidance on Identification of Lead-Based Paint Hazards*. Vol. 60, No. 175, Part V, 60 FR 47248, Monday, September 11, 1995.

Wipe Sampling

Wipe sampling is a way of measuring settled lead dust on a surface. Since settled lead dust is hazardous to children, local health departments often use wipe sampling to assess contamination of homes. Wipe sampling is also commonly used in the lead abatement field by both inspectors and contractors. On occasion, it may also be a useful tool for other contractors.

A contractor may want to use wipe sampling to:

- Assess and document surface lead dust levels inside a building before a job. This is done to provide information to the customer.

- Assess and document surface lead dust levels inside a building during your work. This is done to evaluate how well you are preventing certain "sensitive" areas from being contaminated.
- Assess and document surface lead dust levels inside a building after you have cleaned up at the end of a job. This is done to assess whether you have cleaned areas adequately and, to document your job performance. It might also be done to limit your liability.

- Test whether there is detectable lead contamination on other surfaces that should be clean. You may want to test the following:
  - employees' lunch area
  - area where employees change into clean street clothes
  - equipment you bring into a customer's house
  - equipment after it has been cleaned at the end of a job
  - the inside of company trucks and vans
  - areas at the office or warehouse
- Employees may want to check the inside of their vehicles for detectable lead contamination.

Quantitative Wipe Sampling

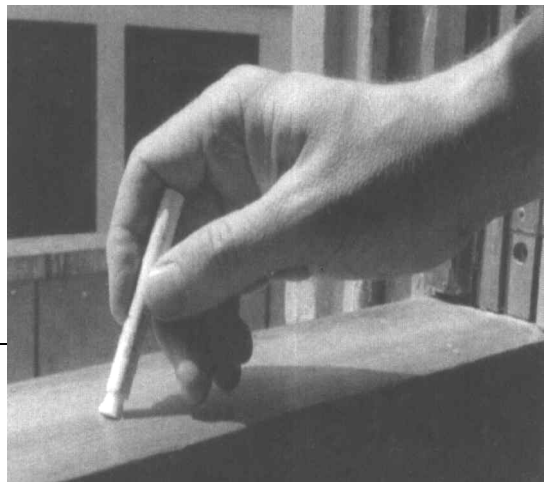
Quantitative wipe sampling determines the actual amount of "wipeable" lead dust present on a measured amount of surface area. Quantitative wipe samples are sent to a laboratory for analysis. If you are hired as a lead abatement contractor (to make housing "lead safe"), either you, or an independent consultant, will be doing quantitative lead surface sampling.

Collecting a dust wipe sample is easy to do. It involves carefully wiping a measured surface area with a baby wipe that is then sent to a lab.

There are CDHS regulations that specify the maximum allowable amount of surface contamination that can be left on different surfaces at the end of a lead abatement job.

Qualitative Wipe Sampling

Qualitative wipe sampling methods test only whether there is lead contamination present on the surface above a certain



detection level. These tests give you immediate results. The test chemical turns color if there is detectable lead on the surface. The EPA and HUD have released a study that shows that wet chemical tests can be unreliable. They are, however, an easy and inexpensive way to confirm the presence of lead. For the painting contractor, qualitative wipe sampling may be a useful tool.

Key Facts

Title X, section 406 (b) requires giving EPA pamphlet, *Protect Your Family From Lead in Your Home* to owners and residents before conducting work that:

- Disturbs 2 square feet or more of painted interior surfaces
- Disturbs 20 square feet or more of painted surfaces in common areas, or
- Disturbs more than 10% of a painted component.

Property excluded from this requirement include:

- Housing built in 1978 or later
- Housing for the elderly or disabled persons (unless children will reside there)
- Zero-bedroom dwellings (studio apartments, dormitories, etc.)
- Housing or components declared lead-free by a certified inspector or risk assessor
- Emergency renovations and repairs

- A confirmation of receipt of the lead pamphlet is required
- All records are to be kept at least 3 years.
- If the pamphlet is delivered to the resident by mail, it must be sent 7 days prior to beginning work.
- Work must begin within 60 of receipt of pamphlet.

How is Lead Measured?

- Lead in paint is measured by XRF or by paint chip samples.
- Lead paint is measured in mg/cm^2 or in percent lead by weight.
- Title X defines "lead paint" as: any paint, varnish, shellac, or other coatings that contains more than 1.0 mg/cm^2 of lead or more than 0.5 percent lead by weight.
- Lead dust is measured by dust wipe samples

Lead dust is measured in $\mu g/ft^2$.

EPA standards are:

- Floors 100 $\mu g/ft^2$
- Sills 500 $\mu g/ft^2$
- Wells 800 $\mu g/ft^2$

The 1012/1013 (HUD) dust standards are:

- Floors 40 μg/ft^2 (25 if a lead hazard "screen")
- Window sills 250 μg/ft^2 (125 if a lead hazard "screen")
- Window wells/troughs 800 μg/ft^2 (for "clearance")

Other Kinds of Assessment

- Measuring Lead in Soil
- Wipe Sampling:
  - Quantitative Wipe Sampling required trained and certificated personnel
  - Qualitative Wipe Sampling are unreliable

CHAPTER 8 — Worker Protection

Chapter 4 detailed many of the work practices regulated by the Lead in Construction Standard. This chapter reviews the regulations relating work conditions with the application of employee protection.

Conditions Triggering Worker Protection?

In general, work practices can be divided between "low-risk" and "high-risk" activities. Work practices that create airborne lead above the PEL (50 $\mu g/m^3$) are considered "high-risk" and have many additional requirements that are beyond the scope of this course. *Chart— Lead in Construction,* Chapter 4 page 62, provides a list of the protective requirements for different levels of airborne lead. These are summarized below.

It is assumed that anyone performing "trigger tasks" (see Chapter 4 page 56) will create "high-risk" conditions. Only through the use of air monitoring may data be developed to prove a particular job using trigger tasks at a particular location creates airborne lead below the PEL and, thus, could be classified a "low-risk" job.

Cal/OSHA recognizes that **wet** manual scraping or sanding alleviates much of the airborne lead and does not consider these techniques to be "trigger tasks." (See *DOSH Letter Confirming "Wet Methods" are Not Trigger Tasks*, **Appendix** page 311.) Thus, if wet methods are used for small jobs of short duration, they are not classified as high-risk jobs. <u>However, the employer must still conduct initial personal air sampling to determine if there is exposure</u>. Wet methods will be explained in detail in the next section of this course.

Exposure Monitoring

<u>Low-risk (below PEL)</u>—
Air monitoring required if:

- the airborne lead level is unknown, or
- there is no previous test data to demonstrate current job does not create levels of lead above the Action Level.

If annual tests for lead levels are found to be below the Action Level, no further monitoring is required if the conditions of the job do not change. This "very low risk" level has no special precautions except mandatory hand and face washing and basic worker training. The initial monitoring will be entered into the database to prove the job did not expose workers to high levels of lead.

If lead levels are found to be at or above the Action Level, air monitoring must be conducted at

- the start of the job
- every six months
- when job changes may result in new or additional exposure, or
- if employees complain of physical symptoms related to lead poisoning.

High-Risk (above PEL)—
Air monitoring always required at:

- the start of the job
- every quarter
- when job changes may result in new or additional exposure, or
- if employees complain of physical symptoms related to lead poisoning.

(See *Repeating Air Sampling* page 150 for schedule of when to repeat air sampling.)

Respirators

Low-risk (below PEL)—Not necessary

High-Risk (above PEL)—Required

Protective Clothing (gloves, overalls, safety glasses or goggles, and shoe coverings)

Low-risk (below PEL)—Recommended

High-Risk (above PEL)—Required

- clean clothing weekly (daily if exposure above 200 $\mu g/m^3$)

- Protective clothing removed at end of shift
- Appropriate laundering or disposal

Personal Hygiene (wash face, hands, and forearms after tasks; no eating, drinking, smoking, or applying makeup or chap stick)

Low-risk (below PEL)—Required
- Provide wash facilities
- Provide lavatory facilities
- Shower facilities not required

High-Risk (above PEL)—Required
Same as for low-risk with the addition of:
- Provide clothing change and storage area
- Showers required if feasible; otherwise, washing hands and face is required

Worker/Supervisor State Certification

Low-risk (below PEL)—Not required. Furthermore, for "low-risk" jobs, DOSH has also been clear that certified workers and supervisors are not needed. (See *DOSH State-Certified Lead Workers Clarification Form Da.1 page 1& 2*, **Appendix** pages 312 and 313.)

High-Risk (above PEL)—Required

General Programs (see Chapter 6 for details)

Medical Testing

Low-risk (below PEL)—Not required unless air monitoring reveals airborne lead above the Action Level (30 μg/m^3). Then must use the same medical surveillance as high-risk jobs.

High-Risk (above PEL)—Biological monitoring required, including BLL plus ZPP or FEP
- Prior to assignment
- Every two months for first six months
- Results must be given in writing to employees.
- If biological monitoring reveals BLL at or above 50 μg/dl, Medical Removal Required.

Hazard Communication Requirements

Any Level of Lead Exposure— Employers must provide employees with information about the dangers and control of lead.

Safety Training

Low-risk (below PEL)—Basic training (this course).

High-Risk (above PEL)—Specialized training that leads to state certification.

Exposure Monitoring

Besides the use of "wet" work practices, the requirement and use of air monitoring represents the single greatest change in work practices faced by contractors and maintenance/renovation workers in the residential real estate industry.

Cal/OSHA Lead in Construction standard requires initial personal air sampling be done for every type of task where there is potential for lead exposure. The exceptions to this rule are:

- If personal air samples were taken within the last 12 months under very similar convictions (same type of task, same type of surface, similar lead paint concentration, same work methods, same environmental conditions, and more).
- If there is data to show that a task involves low-risk and could not produce exposure above the Action Level.
- Depending on the results of the initial sampling, it must be repeated (see *Repeating Air Sampling* page 150 for schedule).

If personal air sampling is not done, Cal/OSHA requires the presumption that the job will expose workers to lead above the PEL, and all pertinent requirements apply (certified workers, medical surveillance, respirators, and more).

Therefore, employers MUST conduct personal air sampling if they want to use "very low risk" or "low-risk" work methods; thereby using lower cost protective measures. The findings will be used to construct a database of

lead exposure on the job and facilitate taking the steps required to assure compliance with the law.

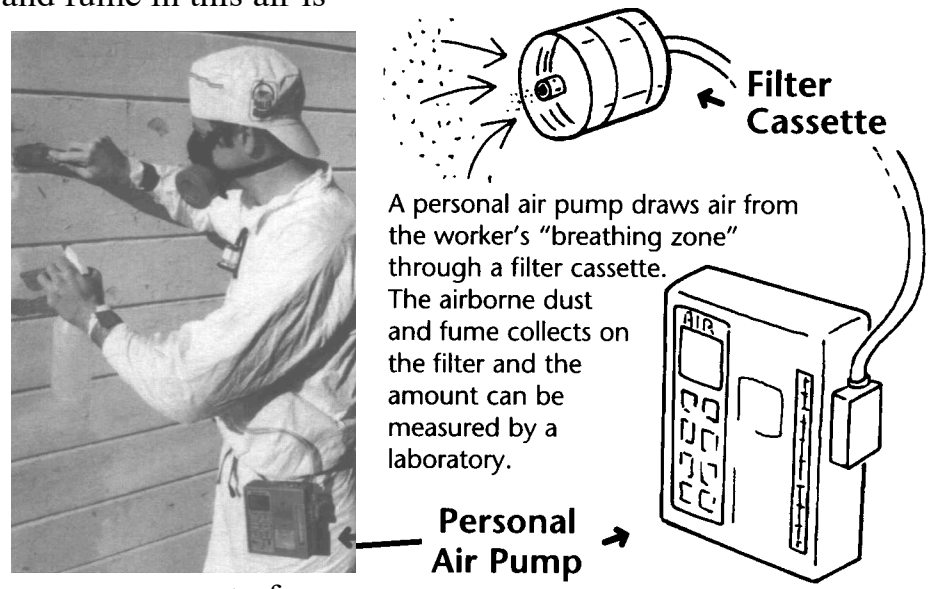
Air Monitoring Details

The goal of this section is to help you understand how and when to use air sampling, and what air sampling results mean. This chapter will not cover the technical aspects of air sampling. As a result of reading this section, you should be able to do the following:

- Understand the Cal/OSHA air sampling requirements.
- Devise an air sampling strategy.
- Discuss the key issues with whoever is doing the air sampling for you.
- Understand what air sampling results mean and don't mean.
- Explain the air sampling results to workers.

What is Air Sampling?

Air sampling measures the amount of lead dust and fume in the air employees are exposed while working with lead paint. To do air sampling, a worker wears a small battery-powered air pump on the waist that is connected by tubing to a filter cassette attached at the collar. For a full work shift, the pump pulls air from the worker's "breathing-zone" and the dust and fume in this air is collected on the filter surface. An analytical laboratory measures the amount of lead collected on the filters. Calculations are then made to estimate the airborne average amount of lead each worker was exposed to during the shift.



Who Should Do Air Sampling?

Air sampling is not particularly difficult, but it requires some training to do correctly. You can hire an industrial hygiene consultant to do this for you, or you may want to contact the Cal/OSHA Consultation Service for free services (although you may have to wait several weeks). Another possibility is to find out if your workers' compensation insurance carrier will provide this service for you. You can do air sampling yourself with the right equipment, and some training and technical assistance from an industrial hygienist or an analytical laboratory.

What Air Sampling Will Tell You

Air sampling is an important tool for determining the following:

- **Whether your work methods are creating too much airborne lead.**
  The results of air sampling will tell you how much airborne lead your work methods are producing. This will help you determine whether you need to use safer work methods. After you make changes, air sampling will help you determine whether these changes have been effective at reducing airborne lead levels.

- **Whether your employees' respiratory protection is adequate.**
  The higher the air sampling results, the more protective your employees' respirators need to be. The results of the air sampling will tell you which kind of respirator will probably provide adequate protection for your employees.

- **Whether you are in compliance with the Cal/OSHA Standard.**
  Cal/OSHA determines what your regulatory obligations are based on air sampling results. In order to stay in compliance, it is necessary to do air sampling.

What Air Sampling Will <u>Not</u> Tell You

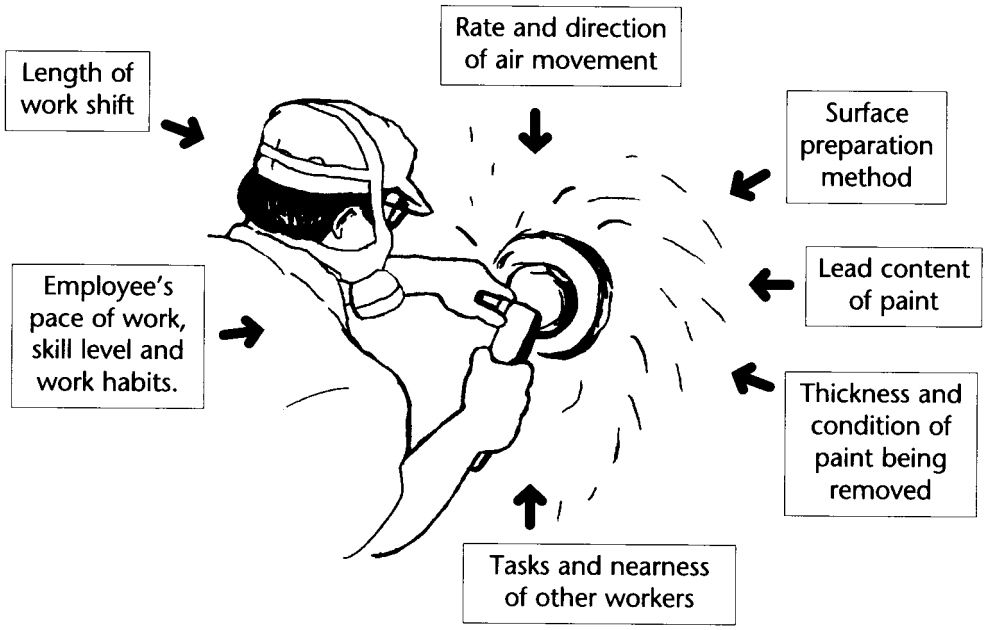
It is always important to remember the limitations of air sampling. Keep the following issues in mind when dealing with air sampling results:

1. Beware: Air Sampling Doesn't Measure Total Lead Exposure.

- Workers can take in lead by inhaling it and by accidentally swallowing it. Air sampling only measures the amount of lead a worker inhales; it tells you nothing about the amount of lead workers are accidentally swallowing. If airborne lead levels are low, workers can still be lead poisoned if there are poor workplace and personal hygiene practices.

2. Beware: Airborne Exposure Levels Vary.

- Even for the same work method at the same job site, airborne exposure levels can vary widely from day to day and from worker to worker. Airborne exposure levels will vary even more from job to job. Airborne exposure levels will be affected by the following factors:



In other words, you should not rely upon past airborne lead sampling results to predict workers' current airborne exposures unless all aspects of the past work closely mirror the current work. And, even then, the air sampling results should be interpreted as only indicating the general magnitude of exposures that can be expected.

Air Sampling: The Basic Vocabulary

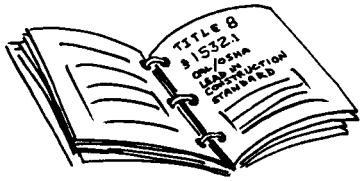
The following terms are commonly used in discussing air sampling:

Full-shift, breathing-zone air sampling. A worker's airborne lead exposure should always be determined based on full-shift, breathing-zone air sampling. Breathing-zone air sampling means that the pump was carried around on the worker and that the sampling filter cassette was in the worker's "breathing-zone" -within 12 inches of the nose and mouth. The full-shift sampling should start at the beginning of the workday and finish when the shift is complete.

Units of Measurement: Micrograms per cubic meter. The level of lead contamination in air is measured in micrograms of lead per cubic meter of air. This is usually abbreviated as "$\mu g/m^3$."

Airborne Lead Exposure: 8-hour time-weighted average.
Based on the results of the full-shift, breathing-zone **air** sampling, the worker's airborne lead exposure should be calculated as **an** equivalent eight-hour time-weighted average exposure (8-hr. TWA). This is true no matter what the actual length of the full shift exposure is. The calculation should be done by the analytical laboratory or the industrial hygienist. Because the 8-hr. TWA is an average concentration, employees may actually be exposed to higher levels for some periods of time, and lower levels at other times. It is the 8-hr. TWA value that you use to determine whether your employees' work methods and respirators are providing enough protection against inhaling airborne lead. And it is this 8-hr. TWA value that is compareed to the exposure limits in the Cal/OSHA Standard.

Air Sampling & Cal/OSHA Requirements



To a large extent Cal/OSHA bases the different requirements of its lead in Construction Standard on the results of air sampling. The following is a brief outline of the basic requirements of the Standard related to air sampling. The section following this will recommend practical ways of addressing these requirements.

Initial Air Sampling

Cal/OSHA assumes that all surface preparation methods on lead-based paint (except wet scraping/sanding) can expose an employee to airborne lead levels above an 8-hr. TWA of 50 $\mu g/m^3$ (the Cal/OSHA Permissible Exposure Limit or PEL). However, the Standard requires that you do initial air sampling to measure workers' exposure to airborne lead during surface preparation unless you have sampled under closely similar workplace conditions in the last 12 months.

Repeating Air Sampling

Cal/OSHA requires that air sampling be repeated with a given frequency depending on what the results of the sampling are:

Air Sampling Results	**Required Repetition**
If results are below 30 $\mu g/m^3$, the Cal/OSHA Action level (AL)	Repeat sampling for this operation on an annual basis
If results are above 30 $\mu g/m^3$ (AL), but below 50 $\mu g/m^3$, the Cal/OSHA PEL	Repeat sampling for this operation every six months until two samples are below 30 $\mu g/m^3$
If results are above 50 $\mu g/m^3$, the Cal/OSHA PEL	Repeat sampling for this operation every 3 months until two samples are below 50 $\mu g/m^3$

Employee Notification

The Cal/OSHA Standard requires that you always notify employees in writing of air sampling results that represent their exposure. The notification should be in a language employees understand. You should notify all affected employees within five days after getting the results. See **Appendix** for sample letters to be given to workers to inform them about air sampling, test results, and the consequences of the results (both **English**, pages 314-316, and **Spanish**, pages 317-318).

HEPA vacuum-exhausted power sander.

Use Controls if Airborne Exposures are Above 50 $\mu g/m^3$.

If air-sampling results show that air levels are above 50 $\mu g/m^3$ (Cal/OSHA's PEL), Cal/OSHA requires that you use all feasible work method controls to bring exposures below this level. This means making feasible changes in the work methods you are using to do surface preparation. In the Standard, "feasible" means technologically feasible and should be determined based on the characteristics of the job site and the effectiveness of the method in completing the job.

Select Respiratory Protection

If you institute all feasible work method controls and the airborne levels are still above 50 $\mu g/m^3$, Cal/OSHA requires that you supplement the controls

with respiratory protection. The level of respiratory protection that you must use depends on how high the air levels are after you have made the feasible work method changes.

When to Do Air Sampling: Worst-Case Work Method Air Sampling

We recommend that you follow a simple strategy when conducting air sampling. This strategy is designed to provide enough information in order to provide adequate protection to your employees.

First, implement all feasible control measures to reduce airborne lead during surface preparation. Then, for each surface preparation work method your company commonly uses, plan to do air sampling which measures the "worst-case" - that is the high end of the range of possible airborne lead exposures to your employees. In this way, you will be reasonably confident that the results do not underestimate employee exposures when using this particular work method. Based on these worst-case air-sampling results, you should then select the level of respiratory protection your employees will wear whenever using this work method. This way you will have good reason to believe that you are providing adequate protection to your employees, without having to repeatedly do air sampling.

For example, if your company does exterior surface preparation using a standard propane torch, you should conduct air sampling on a job site and on a day when you have good reason to believe the exposure to employees doing this will be worst-case. If your employees usually power sand the surface afterwards, you should also do worst-case air sampling for this. You should do "high end" air sampling for all the surface preparation work methods that you use.

Consider the following factors in order to decide when to do the worst-case work method air sampling:

1. The length of the work shift.

- The longer the work shift, the higher the total lead exposure will be. If your employees sometimes use a work method for up to 9 hours on a given day, make sure the employees you are sampling work a long shift.

2. The amount of lead being disturbed.

- The more lead that is disturbed, the more likely the airborne exposure will be worst-case for that work method. Consider these issues: the percentage of lead in the paint, the thickness of the paint to be removed, the condition of the paint, the pace and intensity of the work, and how close together employees are working.

3. Air movement.

- Exposures will tend to be worst-case when there is the least air movement. Don't do worst-case air sampling for exterior surface preparation methods on a breezy day.

Whenever air sampling is done, be sure that there is a written record documenting all relevant factors that could affect the results. This is especially important when conducting worst-case work method air sampling. The documentation will provide a record of what kind of work conditions the air sampling results represent.

When To Repeat Air Sampling

We recommend that you repeat air sampling for a given work method in the following instances:

1. When employee exposures may exceed your current "worst-case" work method results.

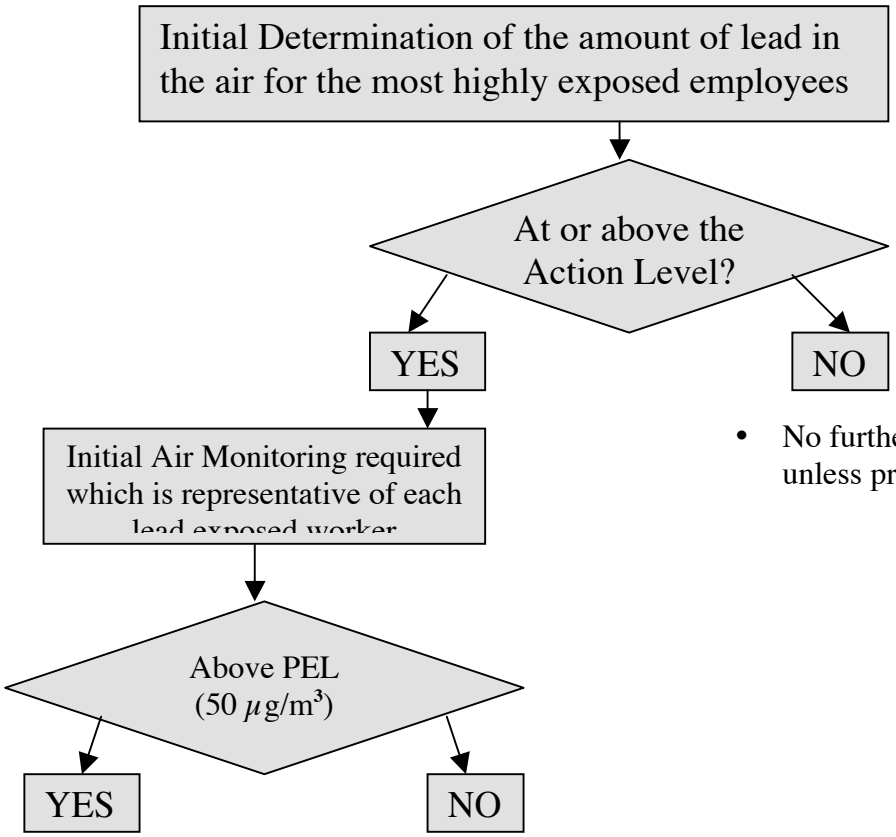
- You should repeat air sampling when your employees are going to be working in conditions which may cause airborne exposure levels that are higher than those previously sampled. You should evaluate this possibility for each job using the three factors listed above.

2. To evaluate work method controls.

- If you change a work method significantly by applying feasible work method controls, then you should consider this a new work method and repeat worst-case air sampling.

The following flow chart helps to illustrate the decision tree for implementing exposure monitoring.

Flow Chart— Exposure Monitoring



- No further air monitoring unless process change

- Air monitoring every three months
- Medical surveillance program
- Comprehensive worker training on lead standard
- Protective clothing including laundry services
- Clean changing rooms
- Showers
- Engineering and work practice control measures and/or use of respirators
- Written compliance program

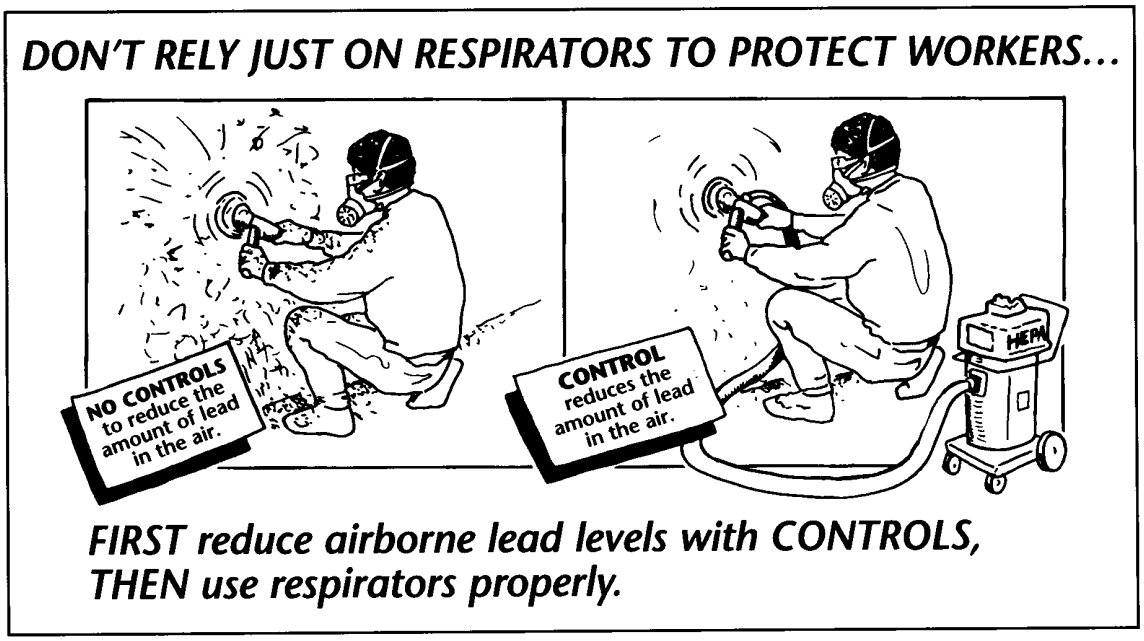
- Air monitoring every six months (if ≥ AL)
- Medical surveillance program (if ≥ AL for more than 30 days annually)
- Comprehensive worker training on lead standard (if ≥ AL)

NOTE: Requirements for worker hazard communicaiton training and housekeeping apply whenever lead is used or disturbed regardless of the airborne lead level

Respirators

Can You Rely on Respirators?

Yes and No. At best a respirator provides only limited protection against inhaling lead dust and fume. And if the respirator is not properly fitted, maintained and worn, the protection is greatly reduced. Respirators should never be used as the first line of protection against lead exposure. However, when used properly, respirators do reduce the amount of lead workers inhale and they are an important part of your lead safety program.



Who is Responsible for Respiratory Protection?

Cal/OSHA regulations make it clear that the employer is responsible for:

- Having workers first checked by a doctor to ensure that they can wear the respirator safely.
- Selecting and purchasing respirators.
- Ensuring that the respirators are providing adequate protection.
- Having an ongoing respiratory protection program.

Why a Respiratory Protection Program is Necessary?

Some people think that respirators are like hard hats - put them on and they will protect you. This is a big mistake. Respirators require constant care and attention to provide even limited protection. This ongoing attention to respiratory protection is the basis of a respiratory protection program. Cal/OSHA wants to see proof that you are doing this, so you need to have a written program and some documentation that you are following it.

Can Anyone Wear a Respirator?

No. Respirators put strain on the heart and lungs, and can be unsafe for some people to wear. Don't be liable for putting a respirator on someone who is not fit to wear one. Each wearer must be medically evaluated to determine if they can wear a respirator without damaging their health.

A medical evaluation is especially important for smokers and persons with a history of lung or heart trouble - emphysema, asthma, breathing difficulties, heart conditions, high blood pressure or coronary artery disease. The healthcare provider should sign a written determination specifying whether there are any limitations on the employee's ability to wear respirators. If it is determined that wearing a respirator is too risky for the worker, the employer must transfer the worker to a job that does not require the use of a respirator.

People with beards, mustaches or sideburns cannot wear respirators that rely on an airtight face seal if the facial hair gets in the way. These workers must either shave off the facial hair, or they can use a helmet or hood style respirator that is equally protective and does not rely on a good face seal to function properly.

Common Kinds of Respirators

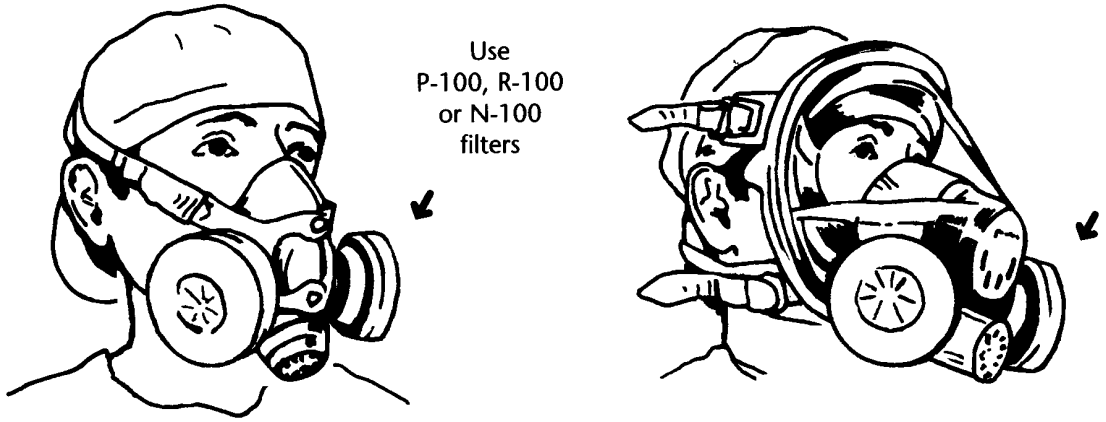
It is important to know how respirators work in order to know what they can and cannot do, and how to take care of them. There are three basic types of respirators- air-purifying respirators (APRs), powered air-purifying respirators (PAPRs) and supplied-air respirators (SARs). You may also hear this last type referred to as air-supplied respirators (ASRs), air-line respirators, or Type C respirators.

Air-Purifying Respirators (APRs)

Air-purifying respirators (APRs) offer adequate protection for most surface preparation work done by residential and commercial painters. They are durable, relatively inexpensive, and easy to maintain.

APRs use filters to reduce the amount of dust, fume or chemical vapor that workers inhale. There are specific filter cartridges for different kinds of contaminants. APRs require the wearer to draw air through the filters when inhaling. This causes some unfiltered air to leak in around the edges of the respirator. The degree of protection depends on how good the face seal is around the edge of the respirator. A good, comfortable fit is very important for APRs.

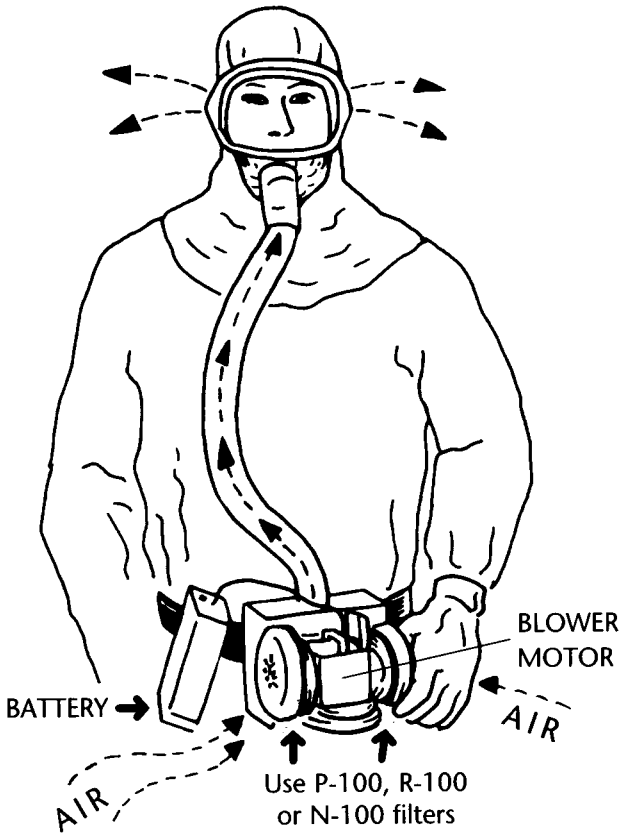
WARNING:Dust masks should never be used to protect against lead dust and fume. They do not fit well enough to protect the worker from breathing in too much lead.



There are two kinds of air-purifying respirators: half-mask and full-face. Cal/OSHA says that when you wear a half-mask APR, you breathe approximately 1/10 of the contaminant that you would without a respirator. Full-face respirators fit better and leak less around the edges. Cal/OSHA says that when you wear a full-face APR you breathe 1/50 of the contaminant that you would without a respirator. Full-face APRs also provide eye protection.

Powered Air-Purifying Respirators (PAPRs)

Powered Air-Purifying Respirators (PAPRs) use a small battery-powered blower to draw air through the filters. PAPRs cost more than APRs and need more attention to ensure that they are operating properly. The only kind of PAPR that provides protection equivalent to a full-face APR is the tight-fitting, full-face PAPR. Because a blower pressurizes the inside of the tight-fitting respirator, unfiltered air does not leak in as easily and the wearer is better protected.



ONE TYPE OF POWERED AIR-PURIFYING RESPIRATOR

Cal/OSHA says that when you wear a tight-fitting, full-face PAPR, you breathe 1/50 of the contaminant that you would without a respirator.

Loose-fitting helmets or hood PAPRs provide only as much protection as a half-mask APR, but some workers like them because they are more comfortable. These can be worn with facial hair.

Cal/OSHA requires that employers provide a PAPR to any employee that requests one instead of an APR.

Supplied Air Respirators (SARs)

Unlike air-purifying respirators and powered air-purifying respirators, supplied air respirators do not filter contaminated air. Instead, they supply clean air to the respirator through an air-line from outside the work area. Air

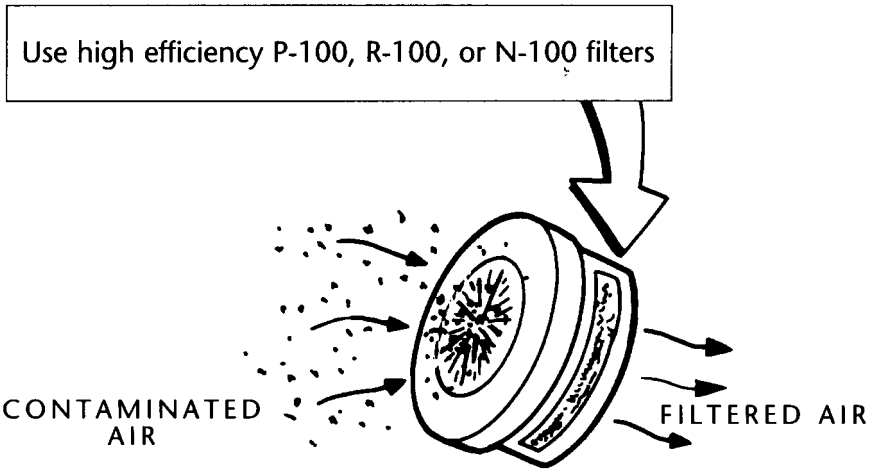
is supplied to the respirator by a special breathing-air compressor. These are expensive systems that can provide a high degree of protection.

Only a "pressure demand" or other positive pressure air-line respirator, gives the wearer more protection than a tight-fitting, full-face PAPR. These kinds of respirators prevent contaminated air from leaking in by maintaining a constant positive pressure inside the respirator facepiece.

If workers are exposed to methylene chloride vapors over the Cal/OSHA permissible exposure limit, Cal/OSHA requires that they wear supplied air respirators.

Use the Proper Filter Cartridges

<u>High Efficiency Filter Cartridges</u>



Both APRs and PAPRs rely on filter cartridges to purify the air that you inhale. It is important that you select the filter cartridge that will protect your employees against the airborne chemicals they are exposed to.

When working with lead dusts, fumes or mists (for example, spraying lead paint), you should wear high efficiency filters. These are P-100, R-100, or N-100 filters. These filters used to be called HEPA filters. P-100 filters are more durable and should always be used when oil mists are also present.

The filters should be replaced following the manufacturer's recommendation and as soon as the wearer experiences any breathing resistance. Be sure always to use filter cartridges that are manufactured by the same company as the respirator and are made to fit that model.

When to use Organic Vapor/P-100 Combination Filter Cartridges

When removing lead paint with a heat or chemical stripping method, workers may need to wear Organic Vapor/P- 100 combination filter cartridges.

- Torch or Heat Gun: When heated with an open flame torch or heat gun, paint gives off organic vapors and lead fumes. Therefore, combination Organic Vapor/P- 100 cartridges should protect workers. These are color-coded magenta and black. They need to be replaced as soon as the wearer smells the vapors through the respirator.

- Solvent Stripping: When stripping with organic solvents, workers may need to use a combination Organic Vapor/ P- 100 cartridge. You cannot always smell methylene chloride vapors when they are present at dangerous levels. Therefore, Cal/OSHA says supplied air respirators, and not APRs, must be used to protect workers against overexposure to methylene chloride.

What Types of Respirators You Should Use

Table *Choosing Respirators Based on Work Method* on page 164 lists different levels of respiratory protection for use with different surface preparation work methods; you should use these kinds of respirators to start with. The table is based on the requirements of the Cal/OSHA Lead in Construction Standard. Cal/OSHA requires that if workers are doing certain kinds of lead work, so-called "trigger tasks," you must provide them with a reasonable level of respiratory protection, even before you do air sampling to determine what their exposure levels are.

The most hazardous work methods, those that generate the most dust or fume, are listed at the top of the Table. The safest methods, those that generate the least amount of dust or fume, are listed at the bottom of the Table. The more dust or fume a method produces, the more protective, and therefore expensive, the respiratory protection has to be to provide adequate protection. The safer methods require the simpler and less expensive kinds of respirators.

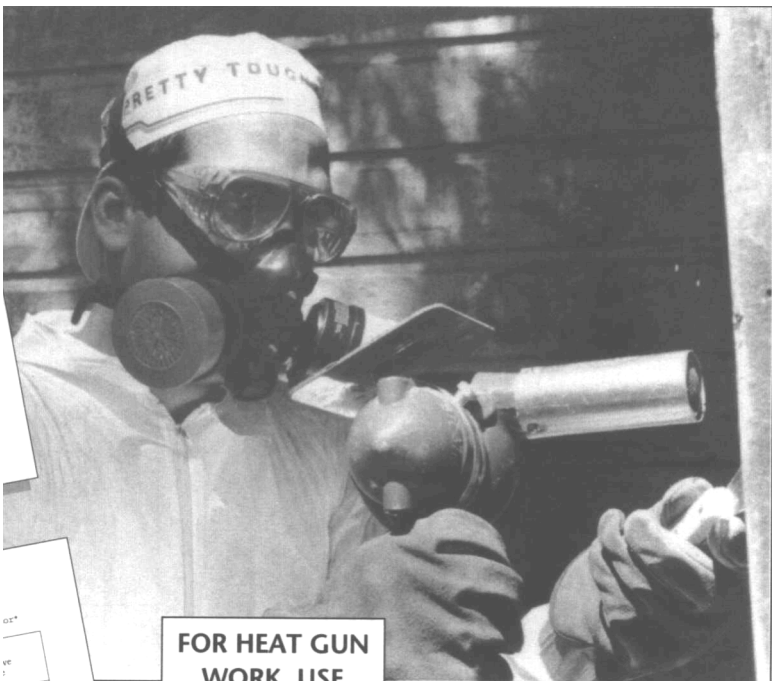
After monitoring the air, exposure levels may be higher than expected. Then you will need to upgrade the level of respirator to provide better protection. Table *Cal/OSHA Required Respiratory Protection based on Airborne Lead Level Measurements* on page 167 presents Cal/OSHA's requirements for selecting respiratory protection on the basis of air monitoring results. Remember: you may also need to upgrade respiratory protection if your employees' blood lead levels begin to rise.

Table— Choosing Respirators Based on Work Method

Hazard	Work Methods	Respiratory Protection	
		O.K.	Better
MOST HAZARDOUS **Eliminate wherever possible**	Abrasive blasting Dry abrasives clean-up and enclosure removal	Supplied air respirator	
Minimize use of these methods and eliminate where feasible	Power sanding and grinding without HEPA exhaust	Full-face air-purifying respirator	Powered air-purifying respirator
	Open flame torching* Spraying lead paint* Dry manual scraping, sanding, brushing Dry manual demolition	Half-mask air-purifying respirator	Full-face air-purifying respirator
SAFEST METHODS **Preferred methods**	Power sanding and grinding with HEPA exhaust Heat Gun with scraping * Chemical stripping* Wet manual scraping, sanding, brushing	Half-mask air-purifying respirator	Full-face air-purifying respirator

*For flame torching, heat gun use, chemical stripping and spraying lead paint, you may need to use Organic Vapor/P-100 combination filter cartridges.

1 Start by selecting respirators listed on page 164 based on the job task.



2 Then do air monitoring. Check page 167 to see if you should upgrade to a better respirator.

Following the Cal/OSHA standard, it is possible to downgrade the level of respiratory protection based on unexpectedly low air sampling results. However, it is better not to downgrade. Airborne exposure levels for a given task often change based on paint lead content, condition of the paint coating, pace of work skill level, work habits, and air movement. So, based on only a few air sample results, you cannot predict what exposure levels will be for this task in the future. If you downgrade the respiratory protection, you may end up not providing enough protection to your employees.

Table— Cal/OSHA Required Respiratory Protection based on Airborne Lead Level Measurements

Airborne Lead Level	Required Respirator*
Above 100,000 $\mu g/m^3$ (Above 2000 X PEL)	• Full-face SCBA in positive pressure mode
Up to 100,000 $\mu g/m^3$ (Up to 2000 X PEL)	• full-face positive-pressure SAR
Up to 50,000 $\mu g/m^3$ (Up to 1000 X PEL)	• Half-mask, positive- pressure SAR
Up to 2500 $\mu g/m^3$ (Up to 50 X PEL)	• Full-face APR • Tight-fitting PAPR • Full-face, demand mode SAR • Continuous flow mode SAR • SCBA in demand mode
Up to 1250 $\mu g/m^3$ (Up to 25 X PEL)	• Loose-fitting or Helmet PAPR • Hood or Helmet continuous supply mode SAR
Up to 500 $\mu g/m^3$ (Up to 10 X PEL)	• Half-mask APR • Half-mask, demand mode SAR

*Commonly used types of respirators are in bold print. APR = Air Purifying Respirator. PAPR = Powered Air Purifying Respirator. SAR = Supplied Air Respirator

$\mu g/m^3$ = micrograms of lead per cubic meter of air.

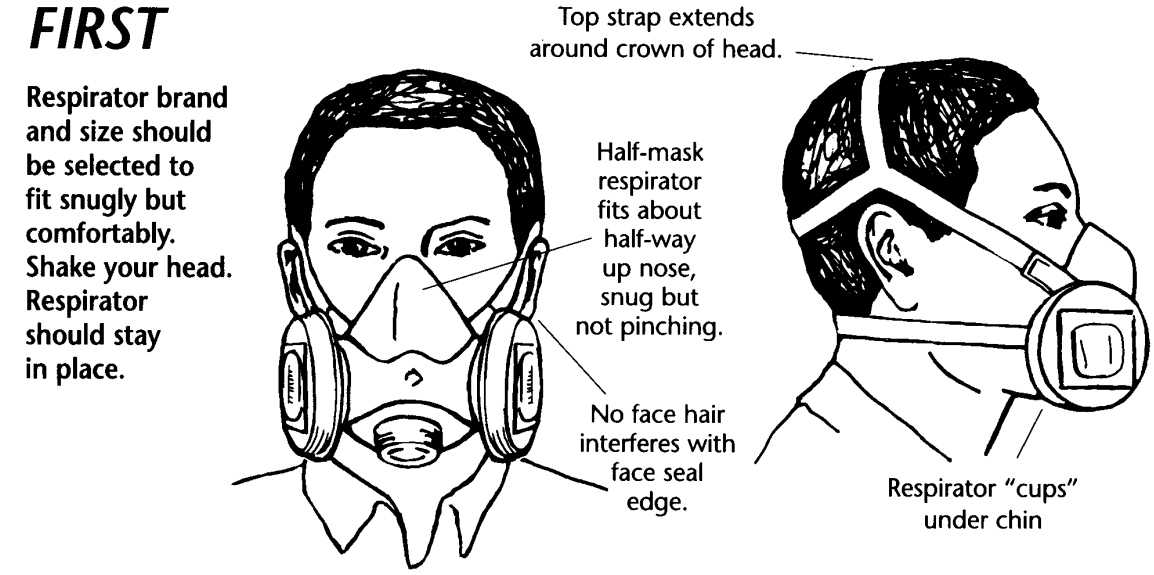
Ensuring Your Workers' Respirators Fit

To provide good protection, air-purifying respirators (APRs) depend on a good face seal. If the face seal is not snug, large amounts of contaminated air will be drawn into the respirator. Then the respirator will be practically useless. Important factors to remember:

- Carefully choose a half-mask or full-face APR that fits well and is comfortable for each individual worker.
- Provide each worker with his or her own individually fitted APR. Do not allow sharing of respirators.
- Instruct workers to check the face seal of their respirator every time they put it on.
- Test whether the APR is still fitting well at least every six months.

Often a safety equipment vendor or occupational health clinic staff person can help with selecting and fit-testing respirators. But this is also something that can be done "in-house" by a trained person who is careful and has had some practice.

As with shoes, manufacturers shape and size their respirators differently. So, to choose the right respirator for each employee, try the different sizes available from at least two different manufacturers.

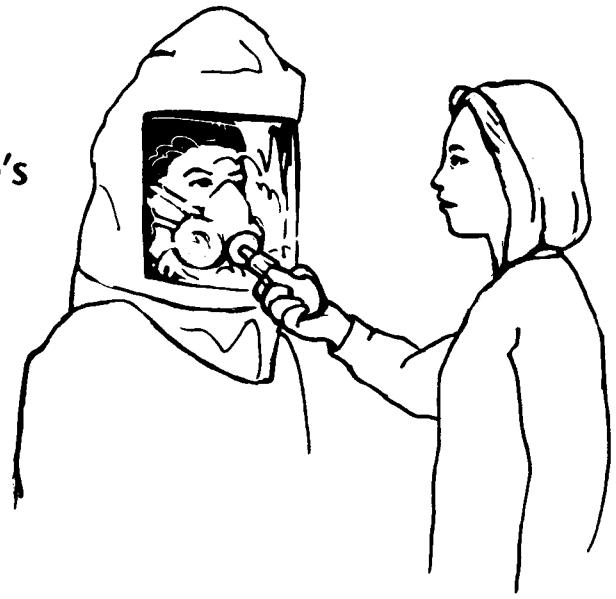


After selecting a respirator that fits comfortably and snugly on the employee's face, you should conduct a "fit test." You should do the same fit-test at least every six months to make sure that the respirator is still fitting well. There are two kinds of fit tests. Both tests check whether a particular

respirator is still fitting well by estimating the amount of air leaking into the respirator around the face seal.

The "qualitative fit test" is a simple, "low-tech" method for checking for face seal leakage that Cal/OSHA says is okay for half-mask APRs. A testing chemical with a strong smell or taste is released around the respirator face seal. If the wearer can smell or taste the chemical, the respirator has failed the fit test. These kits can be purchased from safety supply vendors.

Conduct a fit test of each employee's respirator.



It is also possible to do qualitative fit testing on a full-face respirator and this will provide some assurance that the respirator is fitting properly. However, Cal/OSHA says that a "quantitative fit-test" must be used when fit testing a full-face APR. The "quantitative fit test" uses electronic equipment to measure the actual amount of face seal leakage. This is a usually done at an occupational health clinic.

Checking the Face Seal

Workers should be trained to do a "user seal check" every time they put their respirator on. Getting into this habit is the best thing a wearer can do to ensure good protection. Checking the face seal is a simple two-step procedure:

Positive Seal Check

1. The Positive Seal Check
   - Cover the center exhalation valve with your palm.
   - Inflate the mask slightly by exhaling gently, and then hold your breath.
   - If the mask holds the air and stays inflated, then it has passed the positive fit check.
   - If you feel air leaking around the face seal, adjust the straps and try again.

2. The Negative Seal Check
   - Cover the two filter cartridges with your palms.
   - Collapse the mask by inhaling gently, and then hold your breath for 10 seconds.
   - If air does not leak in and the mask stays collapsed, then it has passed the negative seal check.
   - If you feel air leaking around the face seal, adjust the straps and try again.

Negative Seal Check

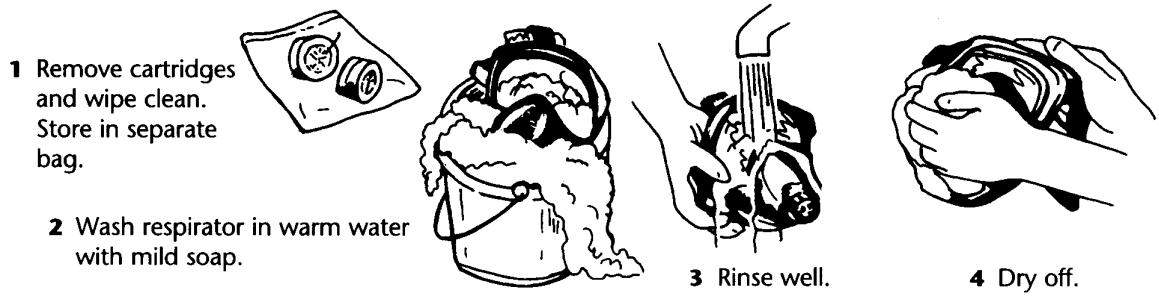
3. Important Points
   - If air is leaking in, but not at the face seal, check the valves to see they are in good condition and functioning properly.
   - The respirator should never be uncomfortably tight.
   - If you cannot get an air-tight face seal without strapping the respirator too tight, then the respirator is probably not the right size or shape. The worker should be fitted with another respirator.

Maintenance, Storage, and Cleaning

New respirators come with the manufacturer's recommended instructions for maintenance and care. However, here are some basic recommendations:

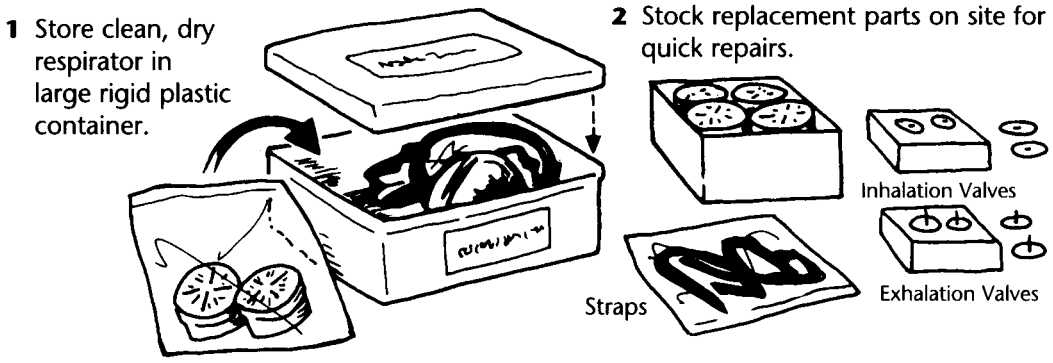
- **Clean respirators after every use**. Always be sure to wash hands before cleaning the respirator. The filter cartridges should be removed and wiped clean if possible. The respirator should be washed in warm water with a mild soap and then rinsed well. Dry off the respirator before storage.

If there is no water available, the respirator can be wiped down with some baby-wipes, although this will not get it as clean. Wipe the inside of the respirator first and then the outside.



- **Store the respirator in a rigid plastic container**. After the respirator has been cleaned and dried, it should be stored in a clean rigid plastic container. The cartridges should be stored in a resealable plastic bag and placed in the container.

- **Regularly inspect the respirator and replace worn or damaged parts**. The worker or a designated person should regularly inspect each respirator and replace worn or damaged parts as needed. Replacement parts for the different kinds of respirators should be stocked on-site for quick repair.



See **Appendix— To Establish a Respirator Protection Program** page 416 —for a form to help you establish your own respiratory protection program.

Key Facts

- Employer's responsibility to provide all necessary protective clothing and equipment— at no cost to the worker.

- Work practices can be divided between—
  - "very low risk" (below Action Level)
  - "low-risk" (below PEL)
  - "high-risk" (above PEL or using "Trigger Tasks" work practices that are always presumed to cause high-risk conditions).

- Wet manual scraping or sanding of small jobs are not trigger tasks.

Exposure Monitoring
If lead is present at any concentration or assumed to be present, air monitoring must be conducted:

- "very low risk" — annually
- "low-risk"— the start of a job, every six months, and/or when job conditions change
- "high-risk"— The start of a job, every three months, and/or when job conditions change

Respirators

- "low-risk" or "very low risk"— Not necessary but must be provided if requested by worker.
- "high-risk"— required and worker must be certified to use.

Protective Clothing
Gloves, overalls, safety glasses or goggles, and shoe coverings.

- "low-risk" or "very low risk"— not required by recommended
- "high-risk"— required with additional conditions

Personal Hygiene
Wash face, hands, and forearms after tasks; no eating, drinking, smoking, or applying makeup or chap stick.

- "low-risk" or "very low risk"— required to provide wash and lavatory facilities.
- "high-risk"— required with additional conditions including showers, and clothes changing facilities.

Worker/Supervisor State Certification

- "low-risk" or "very low risk"— not required
- "high-risk"— required

Air Monitoring

- Air sampling measures the amount of lead dust and fume in the air employees are exposed while working with lead paint.
- Tells how much airborne lead certain work methods are producing.
- Higher air sampling results require greater respirator levels.
- Cal/OSHA respiratory regulations are based on air sampling results.
- Air sampling does not measure the total lead exposure.
- Airborne exposure levels change a lot.
- Employees must be notified in writing of air sampling results which must be in a language employees understand.
- OSHA requires the use of all feasible work method controls to bring exposures below the PEL.
- Air sampling should measure the "worst-case" work conditions.
- Some of the factors that affect air sampling results:
  - Length of work shift.
  - Amount of lead being disturbed.
  - Air movement

Respirators

- Used after other control methods are used to reduce airborne lead.
- Respirators provide only limited protection against inhaling lead dust and fumes.
- Employers are responsible for respiratory protection.
- A physician must first check employees.
- Respiratory program must be in writing and available for inspection by Cal/OSHA.
- Not everyone can wear a respirator:
  - Unsafe for those with medical problems.
  - Beards, mustaches or sideburns can limit the use of respirators.

<u>Three basic types of respirators</u>

- APR— air-purifying respirators_
  - Half-mask
  - Full-mask.

- PAPR— powered air-purifying respirators. Cal/OSHA says that when you wear a tight-fitting, full-face PAPR, you breathe 1/50 of the contaminant that you would without a respirator.
- SAR— supplied-air respirators

Filters

- P-100, R-100, or N-100 filters.
- These filters are sometimes called HEPA filters.
- P- 100 filters are most durable and should always be used when oil mists are also present.

Cal/OSHA requires that employers provide a PAPR to any employee that requests one instead of an APR.

CHAPTER 9— Resident Protection under HUD

There are some general resident protective measures that apply in all situations, whether or not HUD regulations are applicable for a specific maintenance/renovation effort.

General Resident Protection

Residents are not allowed to enter the worksite during hazard reduction activities, until after the work has been completed and clearance (if required) has been achieved (i.e., a certified inspector has taken dust wipe samples of the area and the laboratory results indicate that the clearance standards have been met.)

Residents must be temporarily relocated before and during maintenance, renovation, or construction activities to a suitable, decent, safe, and similarly accessible dwelling unit that does not have lead-based paint hazards, unless:

- Treatment will not disturb lead-based paint, dust-lead hazards, or soil-lead hazards.
- Only the exterior of the dwelling unit is treated. Windows, doors, ventilation intakes, and other openings in or near the worksite are sealed during hazard control work and cleaned afterward. And entry is free of dust-lead hazards, soil-lead hazards, and debris.
- Treatment of the interior will be completed within one period of 8 daytime hours, the worksite is contained so as to prevent the release of leaded dust and debris into other areas, and treatment does not create other safety, health, or environmental hazards.
- Treatment of the interior will be completed within 5 calendar days, the worksite is contained so as to prevent the release of leaded dust and debris into other areas, treatment does not create other safety, health or environmental hazards; and, at the end of work on each day, the worksite and the area within at least 10 feet (3 meters) of the containment area is cleaned to remove any visible dust or debris, and residents have safe access to sleeping areas, and bathroom and kitchen facilities.
- The dwelling unit and the worksite must be secured against unauthorized entry, and residents' belongings protected from contamination by dust-lead hazards and activities. Residents'

belongings in the containment area shall be relocated to a safe and secure area outside the containment area, or covered with an impermeable covering with all seams and edges taped or otherwise sealed.

HUD's Lead Safe Housing Rules (Title X— Section 1012/1013)

Title X, §1012 and §1013, specified requirements for "evaluation and reduction of lead-based paint hazards in Federally assisted housing," and "disposition of Federally owned housing." HUD produced regulations entitled, "Requirements for Notification, evaluation and reduction of Lead-Based Paint Hazards in Federally Owned residential Property and Housing receiving Federal Assistance," 24 CFR Parts 35, 36 and 37. The final rule was published in the Federal Register on September 15, 1999, and the new requirements took effect on September 15, 2000. HUD estimates that about 2.8 million housing units will be affected by this regulation during the first five years.

Types of Housing Covered by this Regulation

- Federally-owned housing being sold
- Housing receiving a federal subsidy that is associated with the property, rather than with the residents (Project Site-based assistance)
- Public Housing
- Housing occupied by a family (with a young child) receiving a tenant-based subsidy (such as a voucher or certificate)
- Multifamily housing for which mortgage insurance is being sought
- Housing receiving federal assistance for rehabilitation, reducing homelessness, and other special needs

Types of Housing/Activities NOT Covered by this Regulation

- Housing built since January 1, 1978
- Housing exclusively for the elderly or people with disabilities, unless a child under the age of 6 is expected to reside there
- Zero-bedroom dwellings, including efficiency apartments, single-room occupancy housing, dormitories, or military barracks
- Property that has been found to be free of lead-based paint by a certified lead-based paint inspector

- Property where all lead-based paint has been removed
- Unoccupied housing that will remain vacant until it is demolished
- Non-residential property
- Any rehabilitation or housing improvement that does not disturb a painted surface
- Emergency repair actions needed to safeguard against imminent danger to human life, health or safety, or to protect the property from further structural damage.
- Emergency housing assistance (as for the homeless), unless the assistance lasts more than 100 days, in which case the rule does apply.

Final Rule Requirements

Before section 1012/1013, regulations were already in place that required the repair of deteriorated paint. The new regulations added the following components:

- Dust testing is required after paint is disturbed in order to make sure that the home is lead safe.
- Anyone involved in performing lead-hazard control work must be trained in accordance with HUD.
- Inspectors, risk assessors, clearance testers must be properly certified according to EPA regulations.
- Distribution of a lead hazard information pamphlet
- Notice to residents of evaluation and hazard reduction activities
- Evaluation of lead-based paint hazards
- Reduction of lead-based paint hazards
- Ongoing monitoring and reevaluation
- Response to a child with an elevated blood lead level
- Record Keeping

In the final rule, there are seven evaluations and hazard reduction strategies. These strategies vary in stringency, cost, and lasting effectiveness. In order from least to most stringent, the seven strategies are:

- Safe work practices during rehabilitation
- Ongoing lead-based paint maintenance practices to assure that paint remains intact, and that safe work practices are used
- Visual assessment and paint stabilization
- Risk assessment and interim controls (with the option of performing specified standard treatments)

- Lead-based paint inspection and risk assessment, and interim controls
- Risk assessment and abatement of lead-based paint hazards
- Lead-based paint inspection and abatement of all lead-based paint

The requirements of the rule apply to exterior surfaces, common areas, and painted surfaces within a dwelling unit. Specific requirements of the regulation depend on whether the housing is being sold or assisted by the federal government, on the type and amount of financial assistance, the age of the structure, and whether the dwelling is rental or owner-occupied. The following chart provides a summary of the requirements for each type of housing.

Summary of Requirements

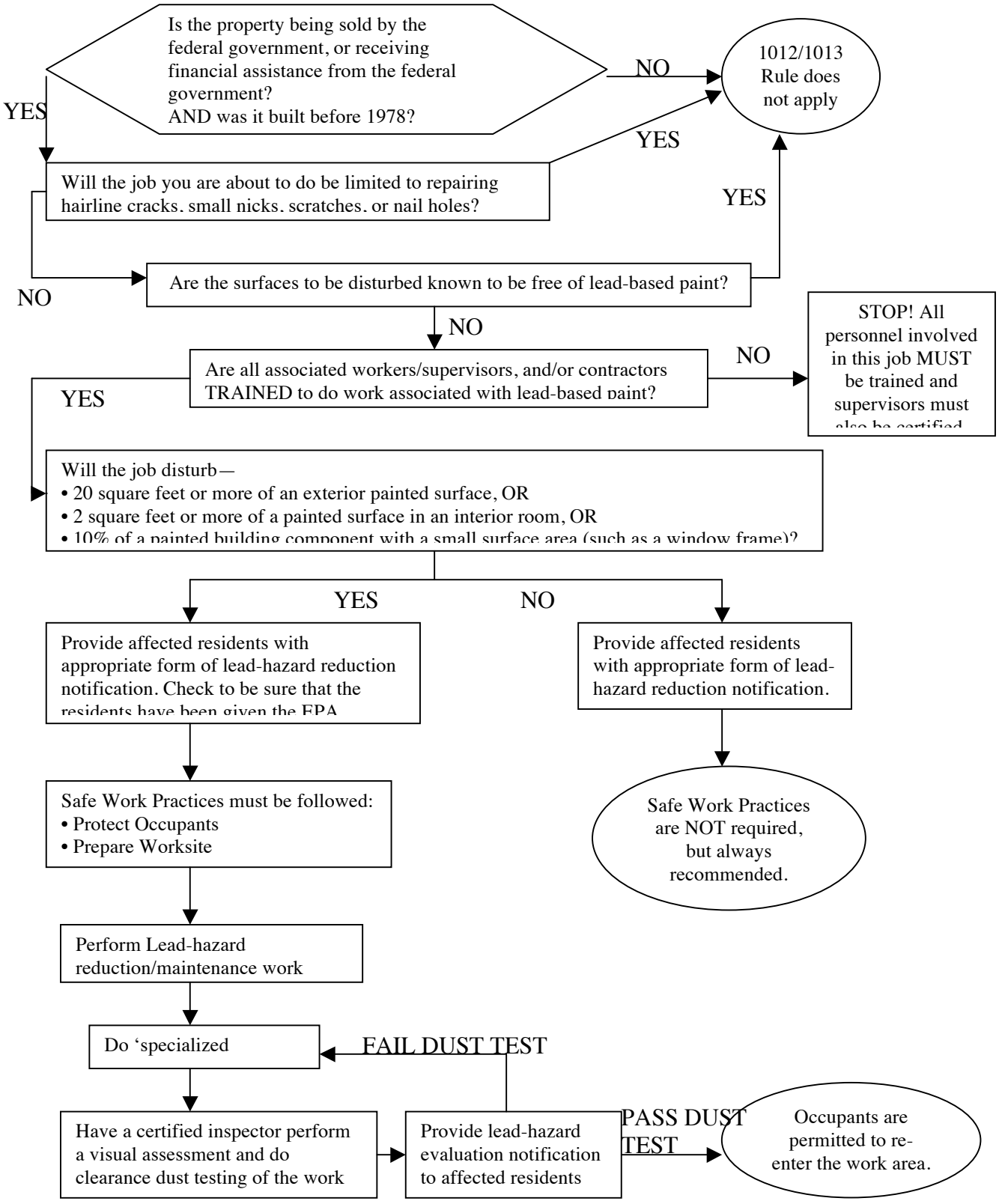
*Note: **Clearance is always required** after abatement, interim controls, paint stabilization, or standard treatments on HUD targeted housing.*

Subpart of Rule/Type Program		Construc Period	Requirements
C.	Disposition by Federal Agency Other than HUD	Pre-1960	• LBP inspection and risk assessment • Abatement of LBP hazards • Notice to residents of inspection/ abatement results
		1960-1977	• LBP inspection and risk assessment • Notice to residents of results
D.	Project-Based Assistance by Federal Agency other than HUD	Pre-1978	• Provision of pamphlet • Risk assessment • Interim controls • Notice to residents of results • Respond to residents of clearance.
F.	HUD-Owned Single Family Sold with a HUD-Insured Mortgage	Pre-1978	• Visual assessment • Paint stabilization • Notice to residents of clearance.
G.	Multifamily Mortgage Insurance		
	1. For properties that are currently residential	Pre-1960	• Provision of pamphlet • Risk assessment • Interim controls • Notice to residents • Ongoing LBP maintenance
		1960-1977	• Provision of pamphlet • Ongoing LBP maintenance.
	2. For conversions and major renovations	Pre-1978	• Provisions of pamphlet • LBP inspection • Abatement of LBP

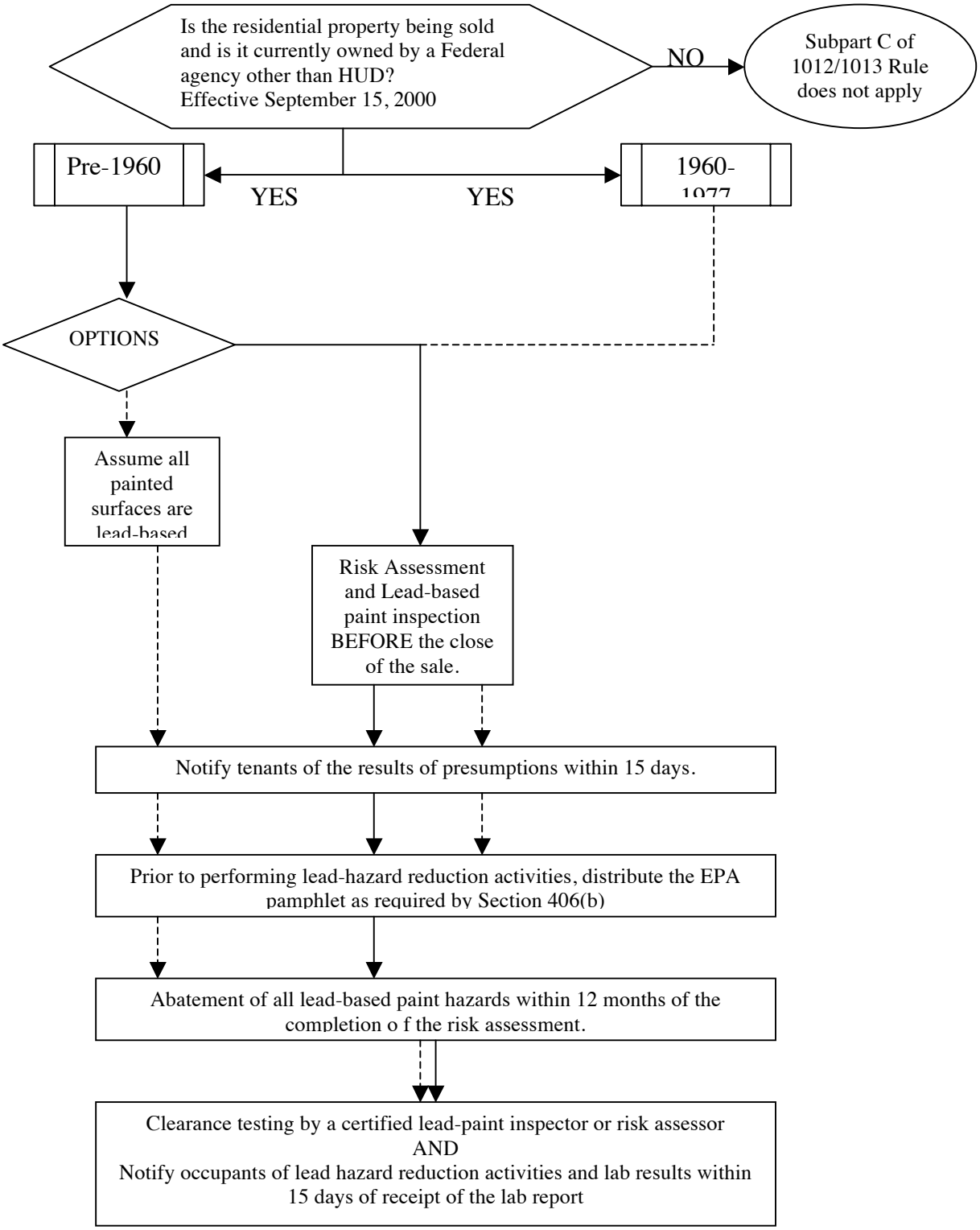
Subpart of Rule/Type Program		Construc Period	Requirements
			• Notice to residents
H.	Project Based Assistance Program		
	1. Multifamily property receiving more than $5,000 per unit, per year.	Pre-1978	• Provision of pamphlet • Risk assessment • Interim controls • Notice to residents • Ongoing LBP maintenance and re-evaluation • Response to EBL child
	2. Multifamily property - receiving less than or equal to $5,000 per unit, per year; and single family properties.	Pre-1978	• Provision of pamphlet • Visual assessment • Paint stabilization • Notice to residents • Ongoing LBP maintenance • Response to EBL child
I.	HUD-owned Multifamily Property	Pre-1978	• Provision of pamphlet • LBP inspection and risk assessment • Interim controls • Notice to residents • Ongoing LBP maintenance • Response to EBL child
J.	Rehabilitation Assistance		
	1. Property receiving less than or equal to $5,000 per unit.	Pre-1978	• Provision of pamphlet • Paint testing of surfaces to be disturbed, or presume LBP • Safe work practices in rehab • Repair disturbed paint. • Notice to residents
	2. Property receiving more than or equal to $5,000 and up to $25,000	Pre-1978	• Provision of pamphlet • Paint testing of surfaces to be disturbed, or presume LBP

Subpart of Rule/Type Program		Construc Period	Requirements
			• Risk Assessment • Interim controls • Notice to residents • Ongoing LBP maintenance
	3. Property receiving more than $25,000 per unit.	Pre-1978	• Provision of pamphlet • Paint testing of surfaces to be disturbed, or presume LBP • Risk Assessment • Abatement of LBP hazards • Notice to residents • Ongoing LBP maintenance
K.	Acquisition, Leasing, Support Services or Operation	Pre-1978	• Provision of pamphlet • Visual assessment • Paint stabilization • Notice to residents • Ongoing LBP maintenance
L.	Rehabilitation Assistance	Pre-1978	• Provision of pamphlet • LBP inspection • Abatement of LBP • Risk assessment if LBP not yet abated. • Interim controls if LBP not yet abated • Notice to residents • Response to EBL child
M	Tenant-Based Rental Assistance	Pre-1978	• Provision of pamphlet • Visual assessment • Paint stabilization • Notice to residents • Ongoing LBP maintenance • Response to EBL child

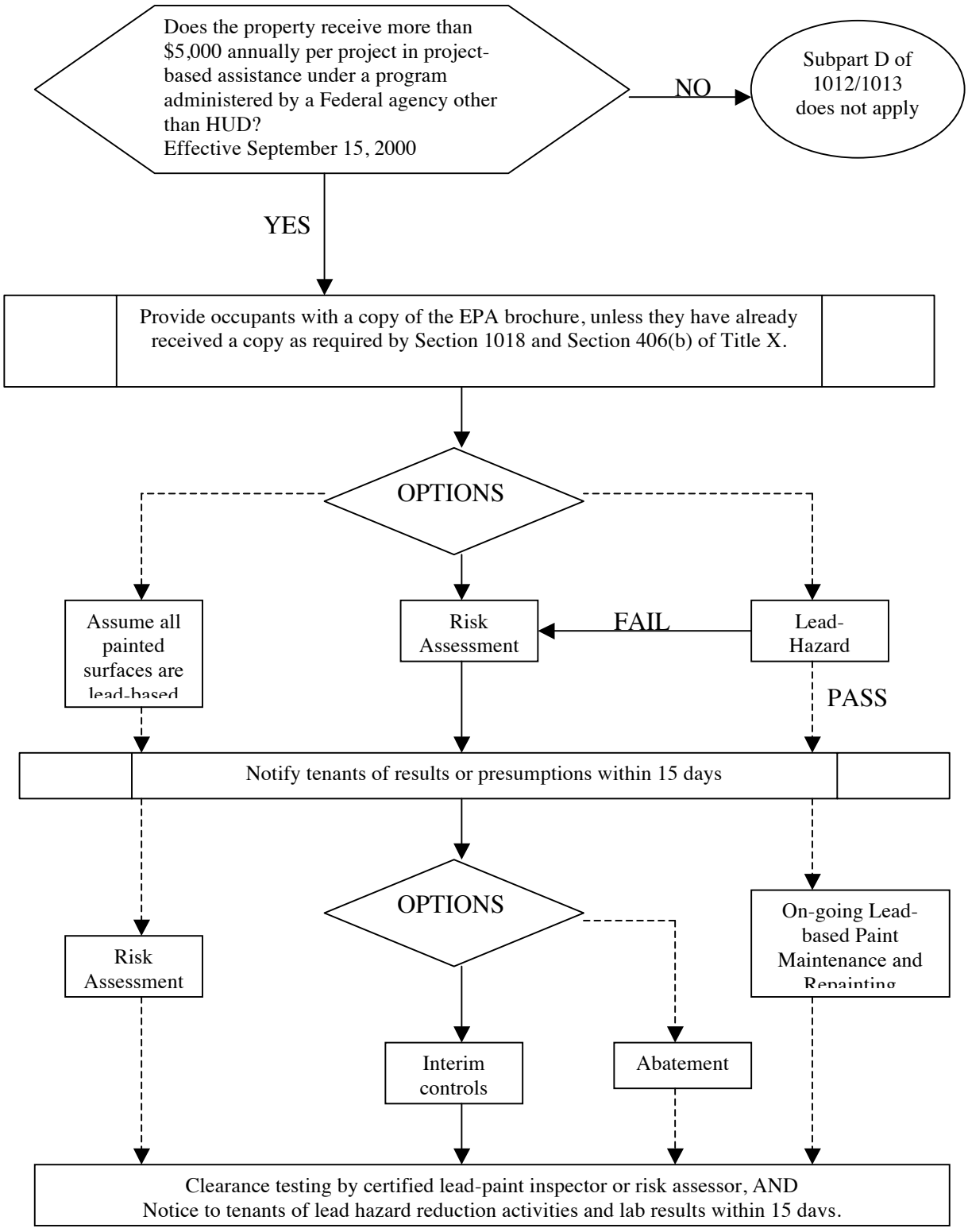
Section 1012/1013 Project Guide



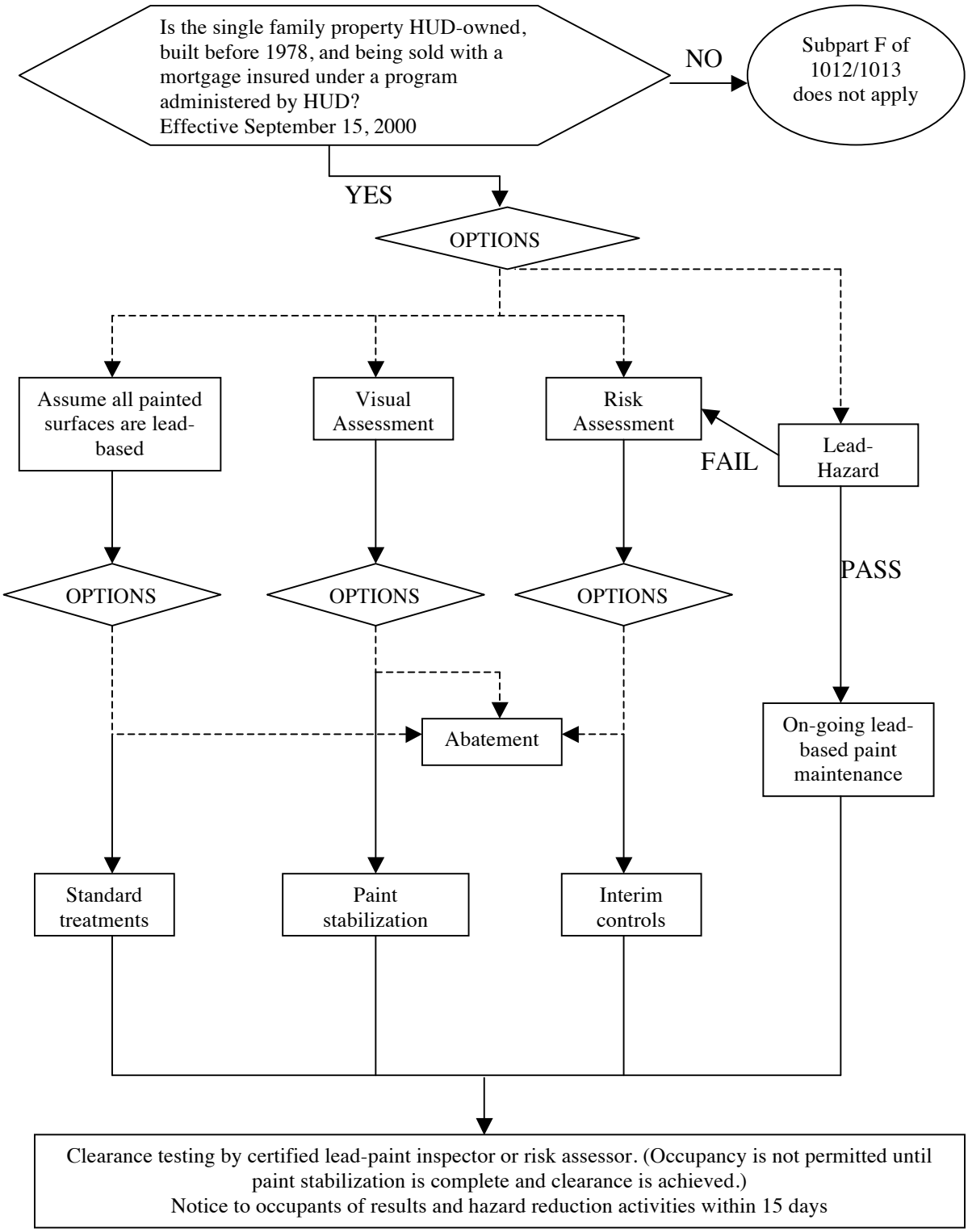
Subpart C: Disposition by a Federal Agency other than HUD



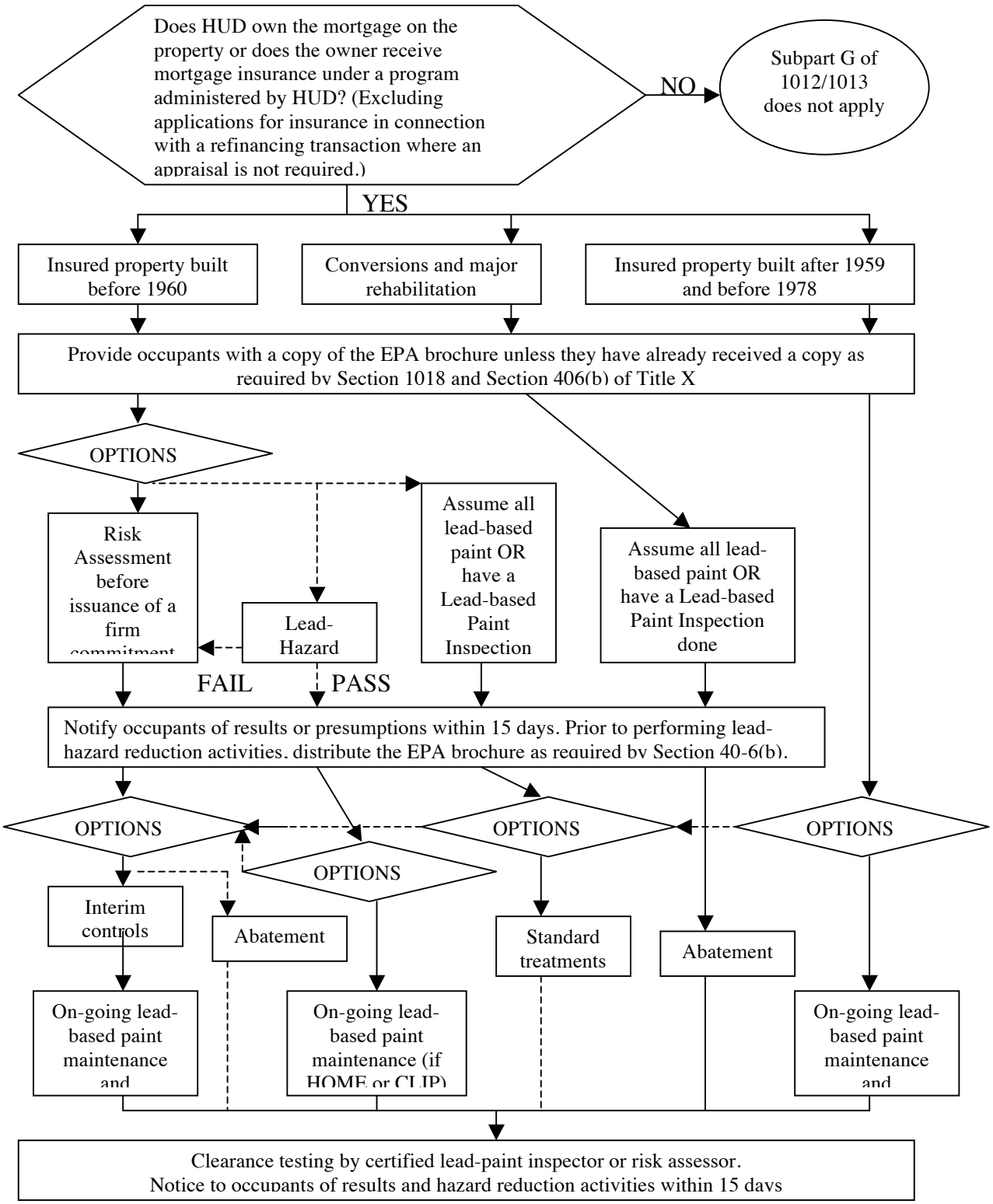
Subpart D: Project-Based Assistance by a Federal Agency Other Than HUD



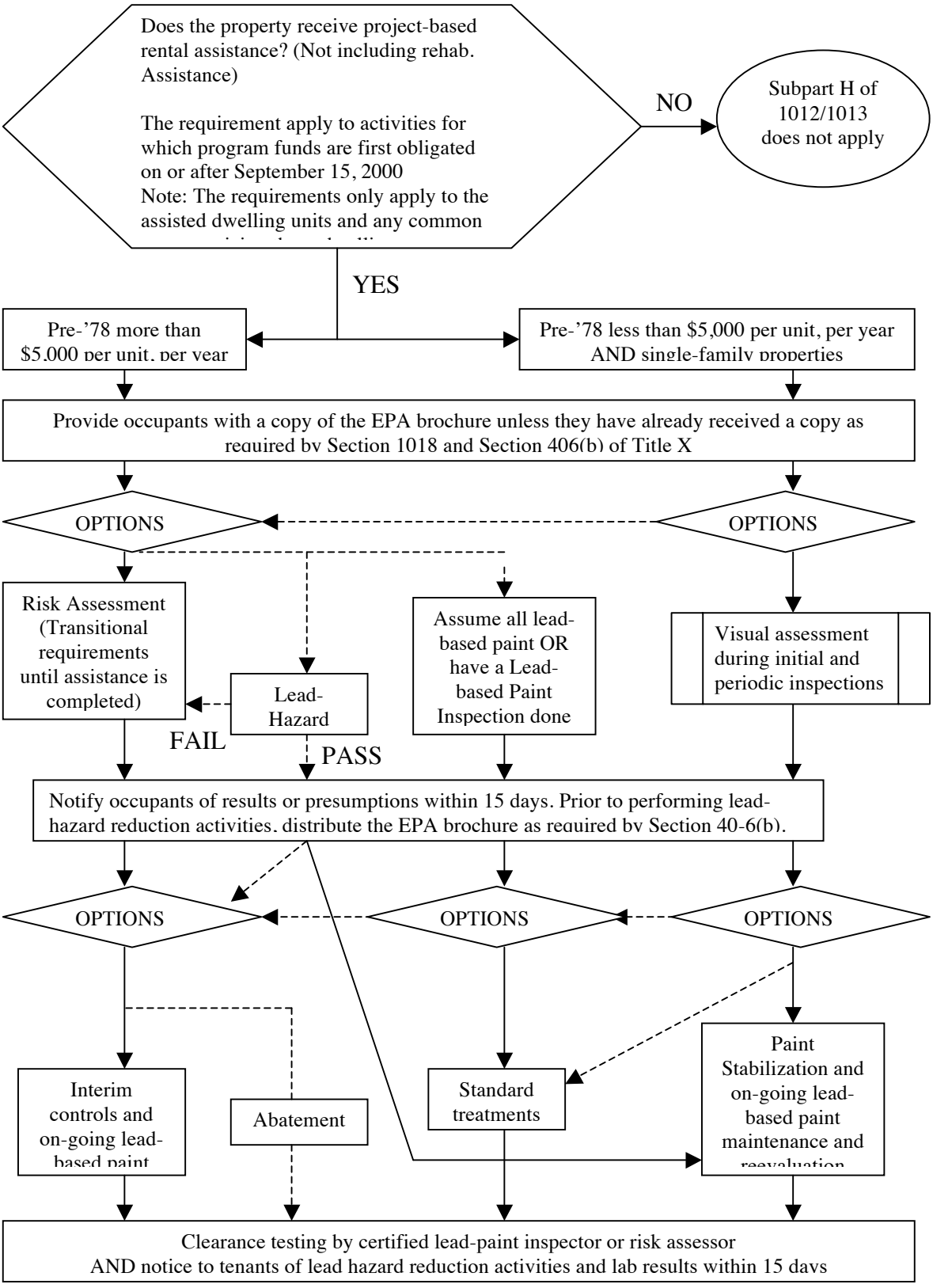
Subpart F: Sale of HUD-Owned Single Family Property



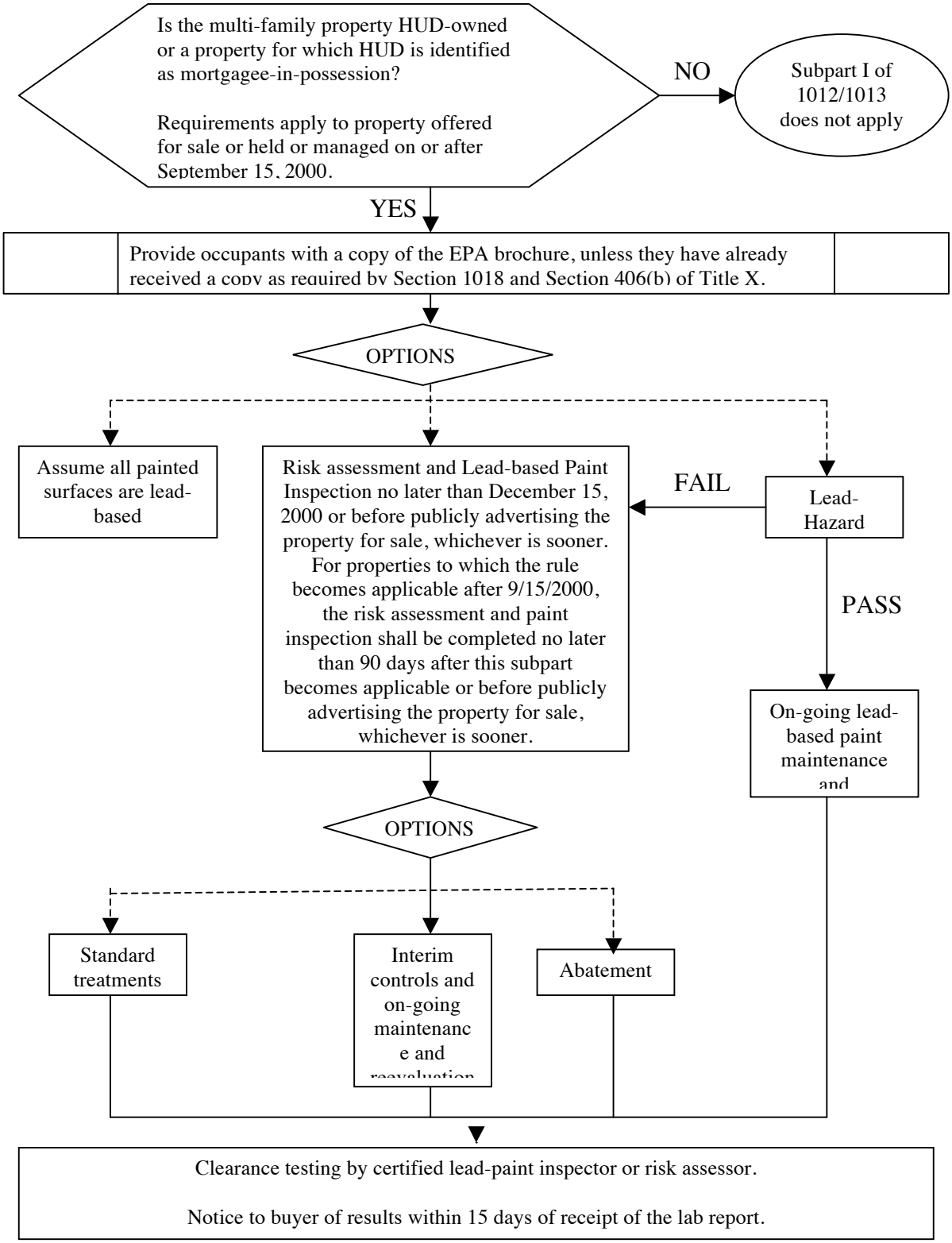
Subpart G: Multi-Family Mortgage Insurance



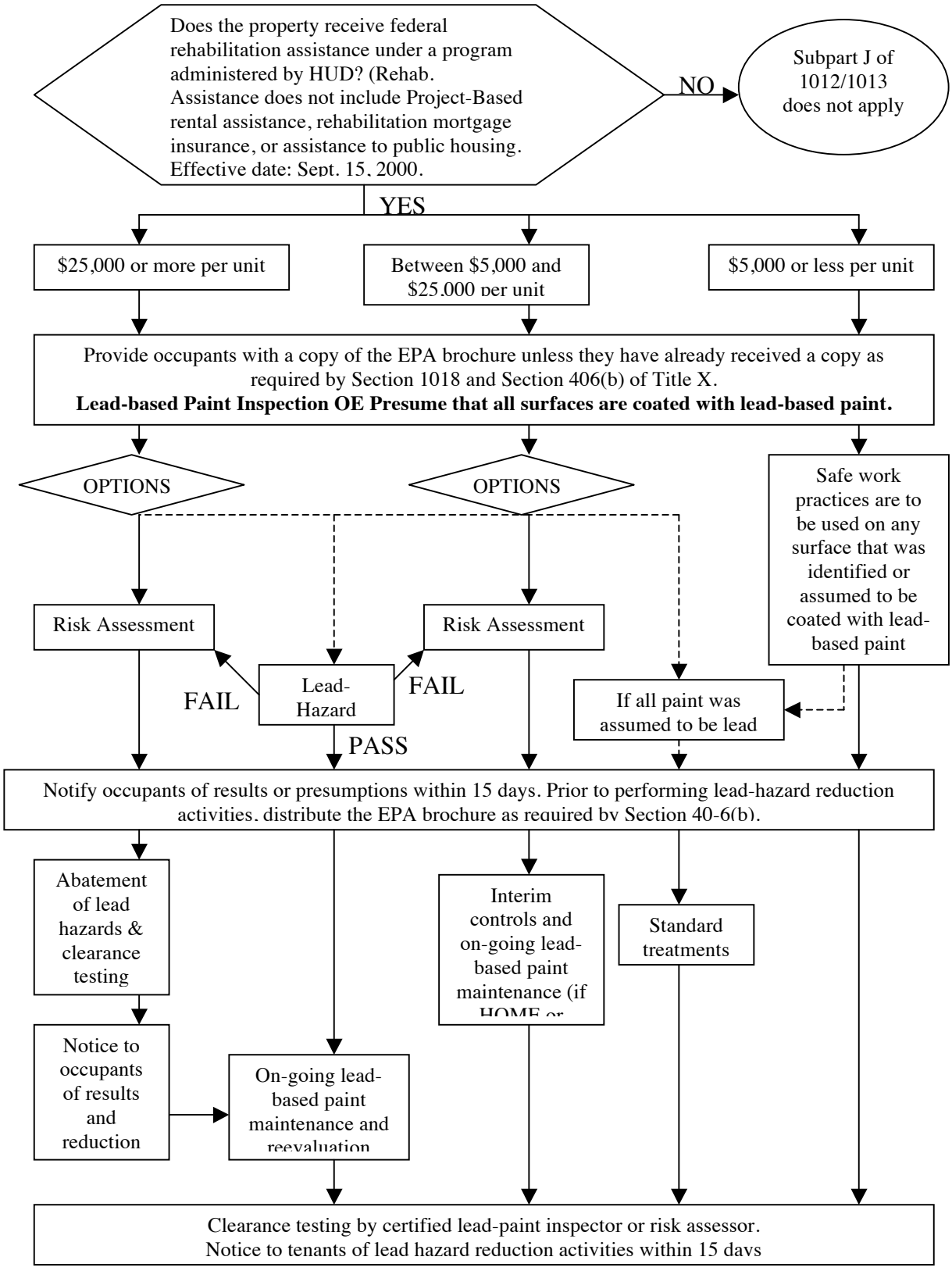
Subpart H: Project-Based Rental Assistance



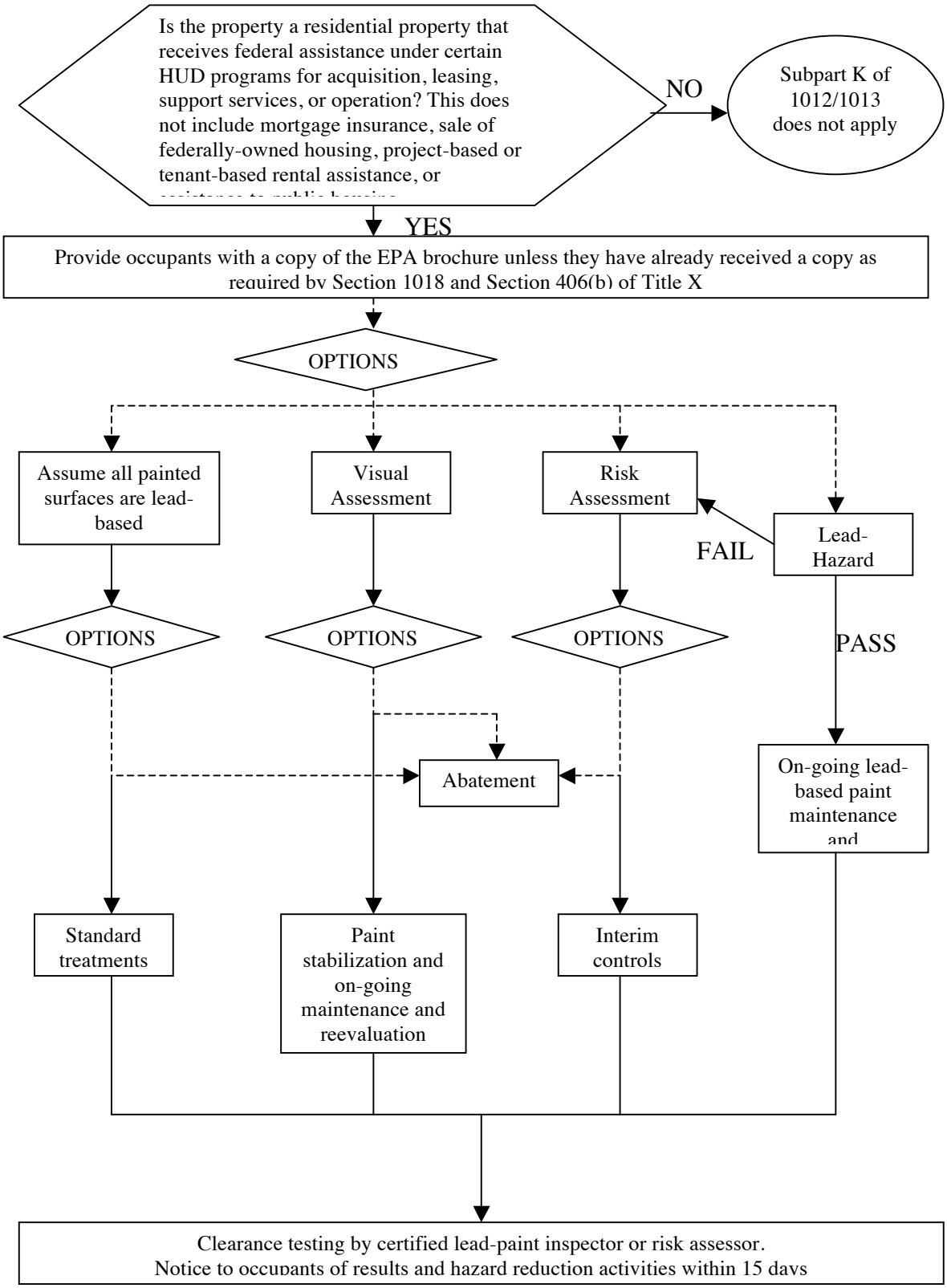
Subpart I: HUD-Owned and Mortgagee-in-Possession Multi-Family Property



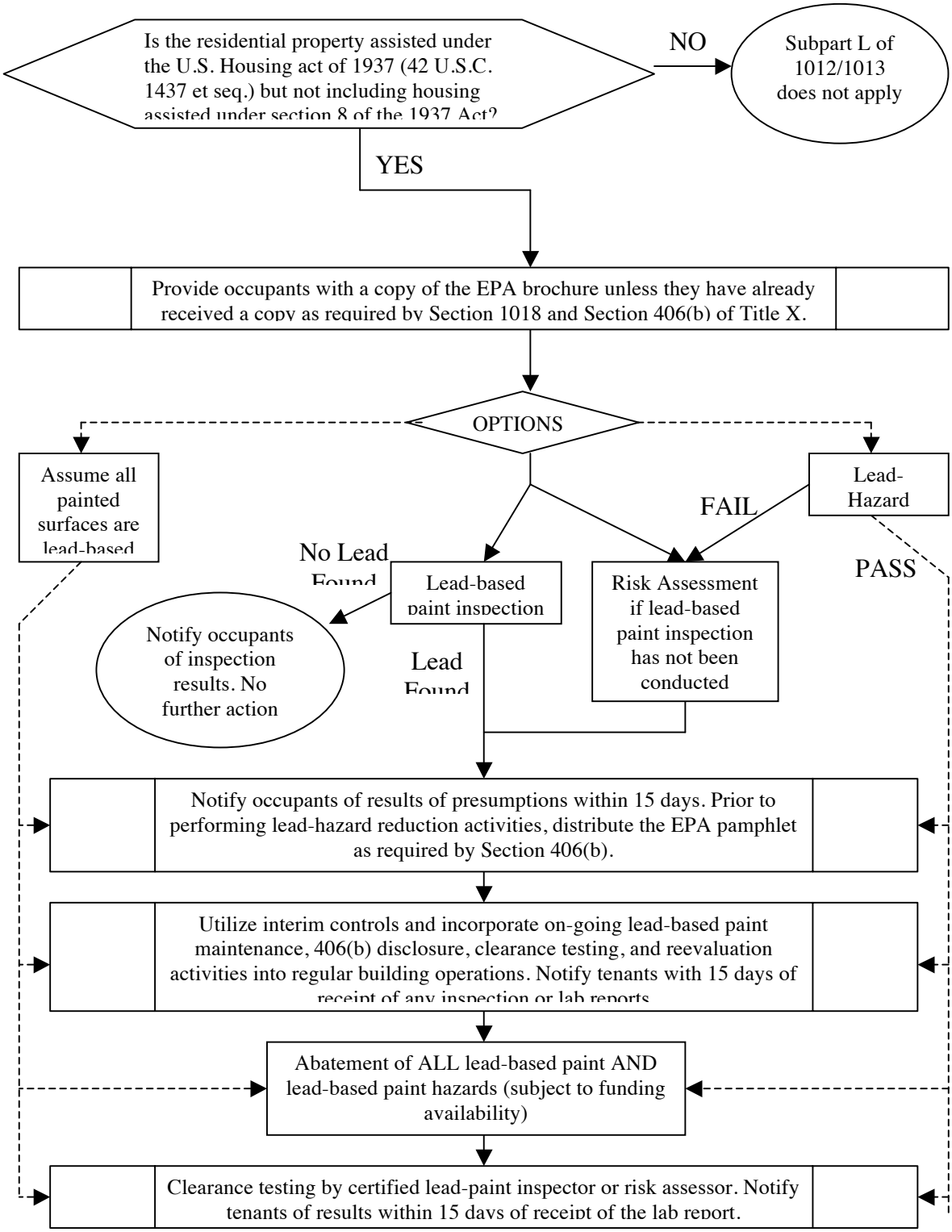
Subpart J: Rehabilitation



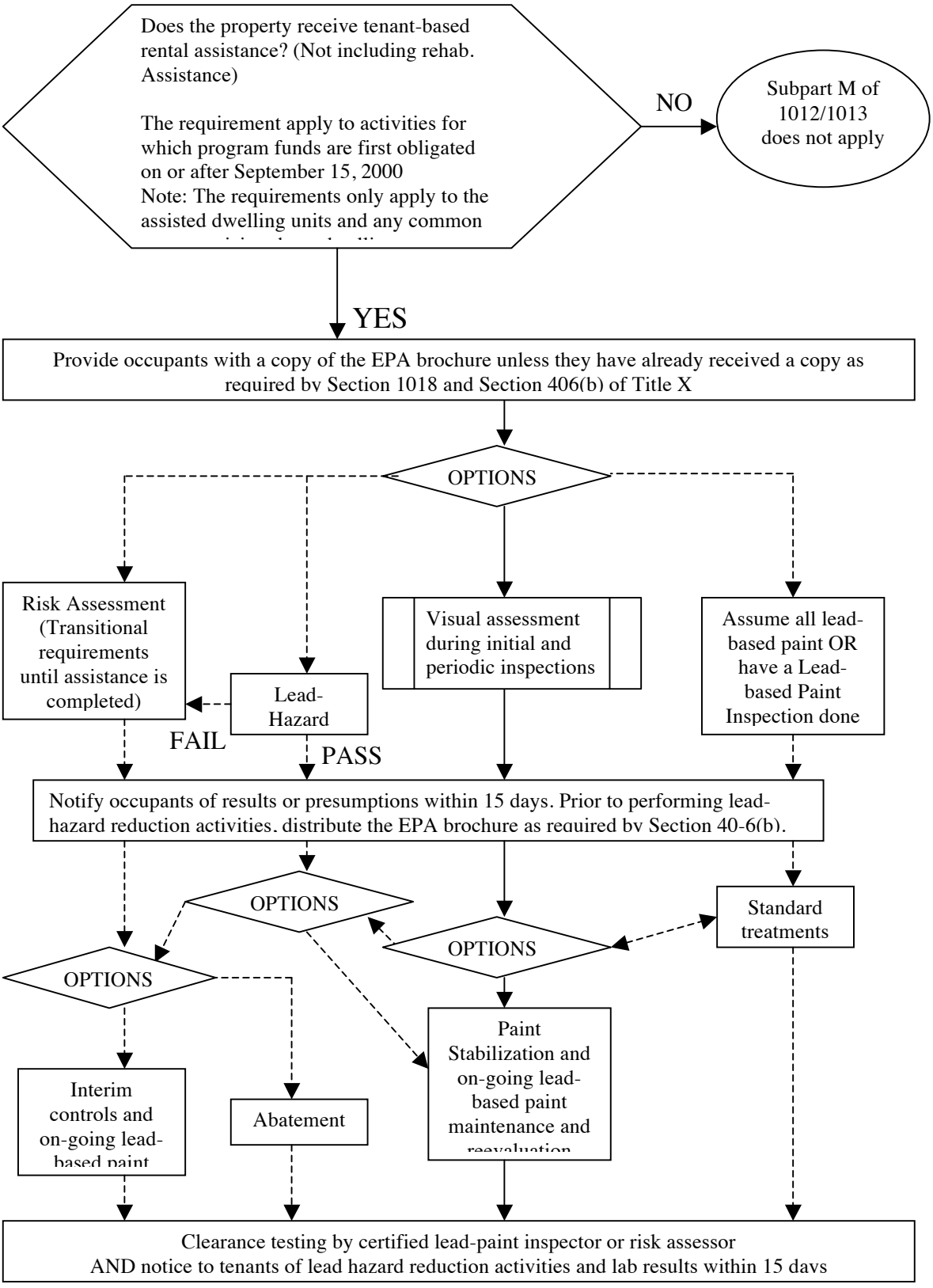
Subpart K: Acquisition, Leasing, Support Services, or Operation



Subpart L: Public Housing Programs



Subpart M: Tenant-Based Rental Assistance



Options to Complying with Regulations

- When risk assessment and interim controls are required, you can choose to do a "standard treatment," which assumes that lead-based paint is present on all surfaces. Under standard treatments, all deteriorated paint is stabilized, all horizontal surfaces are made smooth and cleanable to prevent accumulation of dust, all friction and impact surfaces (that could generate dust and/or paint chips) are corrected, all bare soil is covered, and a final clearance test is passed.

  Stabilizing paint is accomplished by repairing any physical defect in the material beneath the painted surface that is causing the deterioration, removing loose paint and other material from the surface to be treated using wet methods to reduce dust generation, and applying a new protective coating or paint.

- Test any deteriorated paint surface, or any painted surfaces that is going to be disturbed, for the presence of lead-based paint. If the tested surface is found not to contain lead-based paint, the requirements of the rule do not apply.

- When a risk assessment is required, have a lead hazard screen done instead. Lead-hazard screens are less expensive than full risk assessments. If the housing passes the lead-hazard screen, a full risk assessment is not needed.

- Conduct abatement, instead of interim controls and paint stabilization.

- If the regulation requires that you perform abatement of lead-based paint, a lead-based paint inspection is not required if all paint is assumed to be lead-based and all paint is abated.

Implementation of the 1012/1013 Rule

The first step in implementing the requirements of this rule is to determine how it applies to your property. Using the chart— *Summary of Requirements* (page 180)— and locate the program(s) that apply to your property. The chart lists the parts of the rule that are required for each program. If more than one program applies to your property, you must use the most stringent

program. The summary chart lists only the MINIMUM requirements for each program. More stringent measures can be implemented at the discretion of the owner/manager or designated party.

The basic requirements of the rule are defined below:

Distribution of a lead hazard information pamphlet:
If provision of a lead hazard information pamphlet is required, the designated party (owner, grantee, etc…see § 35.110 of the rule) must provide each occupied dwelling unit (to which the rule applies) a copy of the EPA pamphlet, *Protect Your Family From Lead in Your Home*.

Provision of the pamphlet is NOT required if the designated party can demonstrate that the pamphlet has already been provided in accordance with the notification and disclosure requirements of Section 1018 or Section 406(b) of Title X.

It is important that each affected resident receives the pamphlet and acknowledges the receipt thereof. (See **Appendix page 308** for ***Confirmation of Receipt of Lead Pamphlet***.)

If work is to be performed to a common area of a multi-family residential unit, then a notice needs to be posted for all to see. (See **Appendix page 307** for ***Renovation Notice of Common Area***.)

Notice to residents of evaluation and hazard reduction activities:
When an evaluation (risk assessment, lead hazard screen, lead-based paint inspection, paint testing) is undertaken, and lead-based paint and/or lead-based paint hazards are identified, OR if a presumption is made that they are present, the designated party shall provide a notice to residents within 15 calendar days of the date when the report is received or the presumption is made. (See **Appendix page 309** for ***Notice of Evaluation Activity*** and **page 310** for ***Notice of Lead-Based Paint Presumption***.)

When hazard reduction activities (measures designed to reduce or eliminate human exposure to lead-based paint hazards through methods including interim controls and/or abatement) are undertaken, the designated party shall provide a notice to residents no more than

15 calendar days after the hazard reduction activities have been completed.

The notice is to be provided by posting and maintaining it in centrally located common areas (and distributing it to any dwelling unit where the head of household is a person with a known disability), OR by distributing it to each occupied dwelling unit affected by the evaluation, presumption, or hazard reduction activity or serviced by common areas in which an evaluation, presumption or hazard reduction has taken place.

Section 1012/1013 Evaluations

If an evaluation or hazard reduction was conducted at the property or dwelling unit before the property or unit became subject to the requirements of 1012/1013, that evaluation may meet the requirements of the rule. See section 35.165 of the rule for more information.

You must comply with at least the minimum requirements of the rule, as indicated in the summary chart. Every program requires some form of lead-based paint evaluation, and most programs require some type of hazard reduction.

When lead-based paint is identified or presumed to exist, all deteriorated paint must be stabilized or abated, unless the deterioration is limited to hairline cracks or small nicks, scratches or nail holes. In addition, it is not necessary to repair or abate surfaces NOT coated with lead-based paint.

Visual Assessment

Visual assessments are performed by an inspector trained in visual assessment for deteriorated paint surfaces in accordance with procedures established by HUD. The inspector will look for signs of:

- Deteriorated Paint
- Visible surface dust, debris and residue as part of a risk assessment or clearance examination; or
- The completion or failure of a hazard reduction measure.

Lead-Based Paint Inspections and Risk Assessments

A lead-based paint inspection is a surface-by-surface investigation to determine the presence of lead-based paint, followed by a written report explaining the results of the investigation. Lead-based paint inspections can only be done by inspectors or risk assessors who are properly trained and certified (see "Qualifications of Personnel"). These assessment guidelines were given in Chapter 7— Lead-PRE Disclosure and Assessment.

Abatement

Abatement, as defined in this regulation, corrects hazards for at least 20 years. Abatement methods include removal of paint, replacement of painted building components, and enclosure or encapsulation of painted surfaces. Abatement shall be performed in compliance with methods and standards established either by a State or Indian tribe under a program authorized by the EPA, or by EPA at 40 CFR 745.227(e) and shall be completed by achieving clearance in accordance with this rule.

If encapsulation or enclosure is used as a method of abatement, ongoing lead-based paint maintenance activities shall be performed. Abatement of an intact, factory-applied prime coating on metal surfaces is not required unless the surface is a friction surface.

Interim Controls

Interim controls are defined by HUD as: "a set of measures designed to reduce temporarily human exposure or likely exposure to lead-based paint hazards. Interim controls include, but are not limited to, repairs, painting, temporary containment, specialized cleaning, clearance, ongoing lead-based paint maintenance activities, and the establishment and operation of management and resident education programs." Interim controls correct lead-based paint hazards for less than 20 years. If interim controls are used, ongoing maintenance of lead-based paint surfaces is necessary to ensure that the housing remains lead-safe. Risk assessors may recommend interim controls for controlling lead-based paint hazards.

Interim control measures include paint stabilization of deteriorated paint, treatments for friction and impact surfaces where levels of lead dust are

above the acceptable levels, dust control, and lead-contaminated soil control (see "Standard Treatments" below). Interim controls may be performed in combination with, or be replaced by, abatement methods. For more information on the various interim control measures, see part 35.1330 of the rule. Only those interim control methods identified as acceptable methods in a current risk assessment report shall be used to control identified hazards (no risk assessment is needed if only paint stabilization in required). Safe work practices must be utilized, personnel must be appropriately qualified, and clearance must be achieved. Note: HUD's Lead Safe Housing Rule's definition of paint stabilization includes repainting and correcting the source of damage.

Standard Treatments

Standard treatments are a series of hazard reduction measures designed to reduce all lead-based paint hazards in a dwelling unit without the benefit of a risk assessment or other evaluation. Standard treatments include:

- Paint Stabilization – repairing any physical defect in the substrate of a painted surface that is causing paint deterioration, removing loose paint and other material from the surface to be treated, and applying a new protective coating or paint.
- Smooth Cleanable Horizontal Surfaces – all horizontal surfaces (floors, stairs, window sills, window wells) that are rough, pitted, or porous, must be covered with a smooth, cleanable covering or coating, such as metal coil stock, plastic, polyurethane, or linoleum.
- Correcting Dust Generating Conditions – Conditions causing friction or impact of painted surfaces shall be corrected so that the painted surface is not subject to abrasion (re-hanging doors, planing doors, window channel guides, etc…). Paint on stair treads and floors must be protected with a durable cover or coating that will prevent abrasion of the painted surfaces (carpeting, tile, sheet flooring, etc…). Treatment for impact or friction surfaces does not include covering the surface with a coating or other treatment, such as painting over the surface, that does not protect lead-based paint from impact or abrasion.

- Bare Residential Soil – A soil lead-hazard exists if the concentration of lead exceeds 400 ppm in play areas, or 2000 ppm in other areas of bare soil totaling more than 9 square feet. If the concentration of lead in the soil is equal to or greater than 5,000 ppm, the soil must be abated in accordance with 40 CFR 745.227(e). If the concentration of lead in the soil is less than 2000 ppm, but greater than 400 ppm, the soil lead hazard can be treated by application of impermanent coverings (gravel, bark, sod, artificial turf, etc…) or by land use controls (fencing, warning signs, and landscaping).

  Example— Resident Causes Liability

  An older apartment building had a common play area that included swings and climbing bars over sand. One of the residents volunteered to clean and prepare the equipment to make it ready for the paint contractor. The resident chipped off the loose paint, which dropped directly below into the sand. The contractor noticed the improper preparation and reported it to government agencies. The contractor took this action, not to be vindictive to the owner, but, rather, to protect against future liability.

  If temporary coverings are used, they must be designed to withstand the reasonably expected traffic. If loose coverings, like bark or gravel, are used, they must be at least six inches deep. Adequate controls to prevent erosion shall be used in conjunction with impermanent coverings.

  Land use controls can be implemented only if the residents have reasonable alternatives to using the area to be controlled. If the area is subject to erosion, measures must be taken to contain the soil and control dispersion of lead.

Safe Work Practices

Step-by-step listing of safe work practices will be presented in the next section. This section looks at the regulations establishing safe work practices. These include establishing when "safe work practices" are required (*de minimis*), steps needed to insure occupant protection, worksite preparation, specialized cleaning, assessment and testing of a work area after the job is completed, and qualifications for personnel working with lead-hazardous materials.

De minimis levels (24 CFR 35.1350)

"Safe Work Practices" (occupant protection, worksite preparation and specialized cleaning) must be used during stabilization or abatement. All areas of deteriorated paint must be repaired. However, if an area of deteriorated paint is below the "de minimis" (24 CFR 35.1350) amount, it means it is a small area and lead safe work practices and clearance are not required. The de minimis levels are:

- 20 square feet on exterior surfaces
- 2 square feet in any one interior room or space
- 10 percent of the total surface area on an interior or exterior type of component with a small surface area

Response to a Child with an Elevated Blood Lead Level

In most cases in which there is continuing HUD assistance, a risk assessment of the child's dwelling must be completed within 15 days after the owner is notified of the presence of a lead-poisoned child by a health department or other medical health care provider, unless the local Health Department has already completed one. If lead-based paint hazards are identified, they must be corrected within 30 days after the risk assessment has been completed. This requirement applies when a child younger than six years of age has a blood lead level of 20 μg/dl or greater for a single test, or 15-19 μg/dl in two tests taken at least three months apart. This is called an "environmental intervention blood lead level" in the regulation.

Record Keeping Requirements

The designated party is required to keep a copy of each notice, evaluation, and clearance or abatement report for at least three years. Those records that apply to a part of the property for which ongoing lead-based paint maintenance and/or reevaluation activities are required shall be kept and made available until at least three years after such activities are no longer required.

Regulation Delayed

If adverse weather does not permit required hazard reduction work to be completed according to the normal schedule, the work can be delayed until the weather clears.

Residents Relocation During Lead-Hazard Control Work

Residents do not have to be relocated during lead-hazard control work, but, residents (especially children) are never permitted to enter a room, or hallway while work is underway there. Many jobs may be performed without relocation if the work area is contained so that dust generated by the work does not migrate to the rest of the living area during the work, cleanup, and clearance. Generally, it is safer to relocate residents until the work has been completed.

Key Facts

General Occupant Protection

Residents must be temporarily relocated before and during hazard reduction activities, unless:

- Treatment will not disturb lead-based paint, dust-lead hazards, or soil-lead hazards.
- Only the exterior of the dwelling unit is treated**.**
- Work is completed within one period of 8 daytime hours.
- Worksite is contained so as to prevent the release of leaded dust and debris into other areas.

Also, for any maintenance work that disturbs lead painted surfaces,

- Worksite and the area within at least 10 feet (3 meters) of the containment area must be cleaned.
- Residents' belongings must be protected from contamination.
- The dwelling unit and the worksite must be secured against unauthorized entry.
- Clearance testing is required for all work above the "de minimis," on targeted HUD property, or work that engage "trigger tasks."

HUD

Title X, Section 1012/1013

Evaluation and reduction of lead-based paint hazards in Federally assisted housing.

Housing Covered

- Federally-owned housing being sold
- Housing receiving a federal subsidy that is associated with the property, rather than with the residents (Project Site-based assistance)
- Public Housing
- Housing occupied by a family (with a young child) receiving a tenant-based subsidy (such as a voucher or certificate)
- Multifamily housing for which mortgage insurance is being sought
- Housing receiving federal assistance for rehabilitation, reducing homelessness, and other special needs

Housing Not-Covered

- Housing built since January 1, 1978
- Housing exclusively for the elderly or people with disabilities, unless a child under the age of 6 is expected to reside there
- Zero-bedroom dwellings, including efficiency apartments, single-room occupancy housing, dormitories, or military barracks
- Property that has been found to be free of lead-based paint by a certified lead-based paint inspector
- Property where all lead-based paint has been removed
- Unoccupied housing that will remain vacant until it is demolished
- Non-residential property
- Any rehabilitation or housing improvement that does not disturb a painted surface
- Emergency repair actions needed to safeguard against imminent danger to human life, health or safety, or to protect the property from further structural damage.
- Emergency housing assistance (as for the homeless), unless the assistance lasts more than 100 days, in which case the rule does apply.

Final Rules Requirements

- Dust testing is required after paint is disturbed in order to make sure that the home is lead-safe.
- Anyone involved in performing lead-hazard control work must be trained in accordance with HUD (this course).
- Inspectors, risk assessors, clearance testers must be properly certified according to EPA regulations.
- Distribution of a lead hazard information pamphlet.
- Notice to residents of evaluation and hazard reduction activities.
- Evaluation of lead-based paint hazards.
- Reduction of lead-based paint hazards.
- Ongoing monitoring and reevaluation.
- Response to a child with an elevated blood lead level.
- Record Keeping.

Seven Evaluations and Hazard Reduction Strategies (from least to most stringent)

- Safe work practices during rehabilitation.
- Ongoing lead-based paint maintenance practices to assure that paint remains intact, and that safe work practices are used.
- Visual assessment and paint stabilization.

- Risk assessment and interim controls (with the option of performing specified standard treatments).
- Lead-based paint inspection and risk assessment, and interim controls.
- Risk assessment and abatement of lead-based paint hazards.
- Lead-based paint inspection and abatement of all lead-based paint.

HUD Requirements— See:

- Summary of Requirements
- Section 1012/1013 Project Guide
- Flowcharts for Subpart C, D, F, G, H, I, J, K, L, and M.

Assessment/Treatment Options

- Presume lead and conduct "standard treatment."
- Test for the presence of lead-based paint.
- Conduct lead-hazard screen.
- Conduct abatement.

Implementation of the 1012/1013 Rule

Every program requires some form of lead-based paint evaluation, and most programs require some type of hazard reduction.

When lead-based paint is identified or presumed to exist, all deteriorated paint must be stabilized or abated.

Basic Requirements

- Distribute lead hazard information pamphlet to each affected resident before work begins.
- Obtain Confirmation of Receipt of Lead Pamphlet. If residents refuse or are unavailable to sign form, complete bottom of form indicating alternate ways of notification.
- For common areas, post or distribute it to each affected dwelling a Renovation Notice of Common Area.
- If it is presumed there is lead, give residents Notice of Lead-Based Paint Presumption.
- Residents must be given Notice of Evaluation Activity that includes test results within 15 calendar days after report is received.

Evaluations

Visual assessments are performed by an inspector trained in visual assessment and will look for:

- Deteriorated paint
- Visible surface dust, debris and residue as part of a risk assessment or clearance examination; or
- The completion or failure of a hazard reduction measure.

Lead-Based paint Inspections and Risk Assessments

- A surface-by surface investigation to determine the presence of lead-based paint
- Can only be performed by inspectors or risk assessors who are properly trained and certified

Abatement

- Defined in this regulation, corrects hazards for at least 20 years.
- Requires certified inspectors, risk assessors, and workers.

Interim Controls

- Interim controls correct lead-based paint hazards for less than 20 years.
- If interim controls are used, ongoing maintenance of lead-based paint surfaces is necessary to ensure that the housing remains lead-safe.
- Safe work practices must be utilized.
- Personnel must be appropriately qualified.
- Clearance must be achieved.

Standard Treatments

- Standard treatments are a series of hazard reduction measures designed to reduce all lead-based paint hazards in a dwelling unit without the benefit of a risk assessment or other evaluation and include:
  - Paint stabilization
  - Smooth cleanable horizontal surfaces
  - Correcting dust generating conditions
  - Bare residential soil

Other Conditions

- "Safe Work Practices" (occupant protection, worksite preparation and specialized cleaning) must be used during stabilization or abatement when "de minimis" levels are reached or exceeded:

    - 20 square feet on exterior surfaces
    - 2 square feet in any one interior room or space
    - 10 percent of the total surface area on an interior or exterior type of component with a small surface area
- If a child younger than six years of age has a blood lead level of 20 μg/dl or greater for a single test, or 15-19 μg/dl in two tests taken at least three months apart, then the "environmental intervention blood lead level" regulation takes effect:
    - A risk assessment must be completed within 15 days after the owner is notified of the presence of a lead-poisoned child by a health department or other medical health care provider,
    - If lead-based paint hazards are identified, they must be corrected within 30 days after the risk assessment has been completed
- All notices, evaluations, and clearance or abatement reports must be kept for a minimum of three years.
- Delays in hazard reduction work due to adverse weather are allowed.
- Residents do not have to be relocated during lead-hazard control work.
- Residents (especially children) are never permitted to enter a room or hallway while work in underway.
- It is safer to relocate residents until the work has been completed.

CHAPTER 10— Resolving Differences Between Cal/OSHA and HUD Standards

Although Cal/OSHA and HUD write regulations for different populations— Cal/OSHA protecting workers and HUD protecting residents— there is some over lap. For example, HUD established prohibited work practices in order to provide safety for residents. This impacts the implementation of Cal/OSHA regulations concerning work practices.

This chapter looks at a number of these differences between Cal/OSHA and HUD, including the definition *abatement* vs. *interim controls*, the use of certified workers, assessment standards, worker training, notification of work and warning signs, and prohibited work practices. (See **Appendix**, California and HUD Lead-Based Paint Regulations— A Summary, page 319.)

In general, the more stringent regulation is to be followed.

Clarifying "Abatement" as used by OSHA and HUD

The term "abatement" is used differently by OSHA and HUD.

For OSHA, the **intent** of "abatement" is the permanent control of lead hazards by the removal of paint, replacement of painted components, and other activities. Permanent control means measures taken that last more than 20 years. For abatement, OSHA requires state certified supervisors and state certified workers as the only employees allowed to conduct such work. For lead work that does not have the intent of permanent control and last for less than 20 years, certificated workers and supervisors are not required.

HUD, similarly, designated "abatement" for work that lasts more than 20 years and with the intent of permanent control of lead. Again, both state certified supervisors and state certified workers are the only employees allowed to conduct such work. HUD, however, designated the term "interim controls" for work designed to last less than 20 years. Even for interim controls, HUD requires a certified supervisor with trained workers (not certified, but having completed this course leading to a "Notice of Completion"). Thus, for non-abatement or interim jobs, OSHA does not require a certified supervisor; whereas HUD does.

The work methodology for OSHA or HUD is similar in either case. The difference is in the certification of supervisor and worker that is used.

What Painting Contractors Do vs. What Lead Abatement Contractors Do

"Lead Abatement" means permanently eliminating lead paint hazards to building residents. This is done by removing lead-painted surfaces or making them inaccessible. This does not always mean getting rid of all the lead paint. It means making the lead paint unavailable so that it is no longer a hazard.

With the increased understanding of lead paint hazards to children, the lead abatement industry has grown significantly in the last few years. Lead abatement contractors specialize in reducing the hazard (often when there is a lead poisoned child) and not in surface preparation and repainting. A lead abatement contractor is trained and certified and claims to know how to safely remove lead hazards. Most painting contractors don't make the same claim, but they can be trained and certified to do their repaint work safely.

Being a painting contractor is not the same as being a lead abatement contractor— there are similarities. Both types of work can create lead hazards for workers and residents and must be done in a lead-safe manner.

Here is a comparison of what the two trades do:

Activity	Painting Contractors	Lead Abatement Contractors
Replacement of lead-painted building parts	Not usually	Yes
Surface preparation involving removal of lead paint	Yes	Yes
Encapsulation of lead-painted areas with a special coating	Sometimes	Yes
Enclosure of a lead-painted area with a solid, airtight barrier	No	Yes

Qualifications of Personnel

Supervisors and Workers—If the lead work is abatement, all workers and supervisors must be state certified. If the work is not abatement, that is aimed to last less than 20 years ("interim" by HUD definition), then workers need not be certified. Supervisors do not need to be certified for non-abatement work unless HUD regulates it. "Interim" work requires certified supervisors. Workers must be supervised by an individual certified as a lead-based paint abatement supervisor, or have successfully completed an approved course [see section 35.1330(4)].

Recommendation: For non-abatement work, OSHA does not require certified workers or supervisors. HUD, on the other hand, requires certified supervisors. Thus, only if a property owner, management company or maintenance/renovation business can be completely sure that they do not have housing that comes under the control of HUD, we would recommend that the supervisor be lead certified.

Assessment Workers— All dust and soil testing, as well as lead-based paint inspections, risk assessments, clearance testing and abatements, must be performed by individuals CERTIFIED in accordance with EPA regulations or a State or tribal program authorized by the EPA.

To increase the availability of persons qualified to perform clearance examinations, HUD allows certified clearance technicians to perform clearances. HUD also allows uncertified, but trained, technicians to perform clearances provided the clearance report is signed by a certified lead-based paint inspector or risk assessor. This is not allowed in certain states, including California.

Assessing the lead hazard, performing the work, and, certifying the work area to be safe once the work has been done has different employee certification requirements for Cal/OSHA and HUD.

- Cal/OSHA— All lead hazard evaluations (assessors), lead workers, and lead inspectors must be state certified. This applies only if "trigger tasks" are used or the PEL is exceeded (i.e., workers engage in "high-risk" work).

- HUD— Any disturbance of lead-based paint requires inspection. Inspecting the final work is performed by a "Clearance Technician." At this time Cal/OSHA does not recognize Clearance Technicians, and, instead, certified lead inspectors must be used. There is pending Cal/OSHA regulations to allow the use of a Clearance Technician in HUD situations.

Recommendation: Assessment is required only if the work is "high-risk" or comes under HUD regulations. In those cases, the assessor must be certificated by the state. HUD Clearance Technicians are not, at this time, accepted in California and state certified assessors are required instead.

Assessment Standard—

Clearance Testing is required by both Cal/OSHA and HUD under the following conditions:

Cal/OSHA: Abatement (intent of permanent— 20 years or longer— removal) work requires submission of form 8552 to Department of Health and Safety. If a Clearance Test is performed in non-abatement situations, form 8552 must be submitted to DHS.

HUD: All lead hazard control activities above "de minimis" (more than 2 sq.ft. of any interior wall, 20 sq. ft. of exterior wall, or 10% of small area component)

Clearance levels (as of 2001) are as follows:

	California	**HUD**	
Floors	50 μg/ft^2		**40 μg/ft^2**
Interior Horizontal Surfaces	250 μg/ft^2	Window Sills	250 μg/ft^2
Exterior Horizontal Surfaces	800 μg/ft^2	Window Troughs	**400 μg/ft^2**
Soil	**1000 ppm**	(hazard level)	1200 ppm
Soil (play areas)	400 ppm	(hazard level)	400 ppm

Recommendation: The bolded numbers are the most stringent and are the clearance levels one should aim to achieve during lead work.

Employee Training

Workers performing lead-based paint maintenance, including paint stabilization, must be trained in safe work practices according to 29 CFR 1926.59. Cal/OSHA has no specific requirements as to the structure of the training except for topics that are to be covered.

HUD requires workers engaged in interim controls to attend an introductory course on lead and obtain a "Notice of Completion."

Recommendation: It is to the best interest of maintenance/renovation businesses to have written records of all employee lead training. Thus, it is recommended that all employees attend a basic course on lead that issues "Notice of Completion" (such as this course).

Notification of Work and Warning Signs

Posting Warning Signs— Both Cal/OSHA and HUD require the posting of the Cal/OSHA sign around areas of lead hazards while work is progressing (*see* Chapter 4).

If the work is lead abatement, Cal/OSHA requires posting "Abatement of Lead hazards Notification" (DHS Form 8551) and submission of form to Department of Health and Safety 5 days prior to the start of work.

If the work comes under HUD regulations, Clearance Test results must be posted within 15 days of receipt of results.

Prohibited Work Practices

HUD restricts the following work practices:

- Power Sanders or Grinders Without HEPA Vacuum Attachment
- Open Flame/High Heat Removal of Paint (heat guns above 1100 degrees F)
- Paint Strippers Containing Methylene Chloride.
- Uncontained Hydroblasting or Abrasive Blasting
- Extensive Dry Scraping or Sanding.

Cal/OSHA does not have any particular restricted practices; however, the ones listed above are "trigger tasks" and require certified workers and extensive modified work, safety and hygiene practices.

Recommendation: To keep the job "low-risk," do not engage in any of the HUD restricted practices or Cal/OSHA trigger tasks.

Key Facts

Abatement

- OSHA— The intent of abatement is to control lead hazard. "Permanent" abatement are methods used to control lead hazard for more than 20 years.
- HUD— The intent of abatement is to permanently control lead hazard for 20 years or more. Controls designed to last less than 20 years are designated as "interim" control instead of "abatement."

Paint Contractor vs. Abatement Contractor

- Paint Contractors need to use lead-safe methods. This, however, does not make them abatement contractors who must be state licensed.

Supervisors and Workers

- Supervisors should be certified. This is not necessary if all work is exempt from HUD regulations and workers do not engage in Cal/OSHA "trigger tasks."
- Workers need to be certified only for abatement work, or engage in HUD prohibited work practices, or Cal/OSHA "trigger tasks."

Assessment

- Cal/OSHA— required on "high-risk" jobs. Assessors need to be state certified.
- HUD— required whenever lead-based paint is disturbed above the "de minimis." Although HUD allows Clearance Technicians to perform assessments, California does not and certified assessors are required instead.

Clearance Levels

The most stringent requirements are:

- Floors 40 μg/ft^2
- Interior Horizontal Surfaces (Window Sills) 250 μg/ft^2
- Exterior Horizontal Surfaces (Window Troughs) 400 μg/ft^2
- Soil 1000 ppm

Employee Training

- All employees must receive basic awareness training on lead hazards.
- HUD requires "Notice of Completion" for lead workers.

- All high-risk jobs require employees to attend extensive training and become certified by the state.

Prohibited Work Practices

- Cal/OSHA "trigger tasks" covers the work practices prohibited by HUD. By avoiding these practices, maintenance/renovation businesses will keep jobs as "low-risk" and thus keep costs down.

CHAPTER 11 — Environment Protection

Which Environmental Regulations Affect Contractors?

This chapter summarizes the requirements of waste disposal, water quality, air quality, and other environmental laws that can affect painting and remodeling contractors. The focus is on jobs where lead-based paint is present. However, it is important to remember that environmental regulations are a concern on all jobs. For example, safe disposal of used thinner is always required, regardless of lead being present. Special emphasis is placed on waste disposal regulations because they are a common concern among contractors.

The environmental regulations most affecting maintenance, renovation, and construction stems from 3 area:

WASTE DISPOSAL ↓	**WATER QUALITY** ↓	**AIR QUALITY** ↓
• THINNERS	• POWER WASHING	• DRY ABRASIVE
• STRIPPERS	• RINSE WATER	• BLASTING
• PAINTS & COATINGS		
• LEAD CHIPS & DUST		

How Can You Ensure Compliance With Environmental Regulations?

The best way to ensure compliance with environmental regulations is to have a lead safety program. You can prevent environmental contamination by:

- Using safe work methods that generate little dust.
- Containing paint chips, dust, and demolition debris.
- Cleaning up daily.
- Disposing of waste properly.

The tasks listed above are complementary—they work together to protect both workers and the environment. For example, wet scrapping generates less dust and limits exposure to workers, residents, and the environment. HEPA-exhausted power sanding also greatly reduces dust exposure as well as cleanup time. Containment helps control the spread of debris, and regular

cleanup prevents environmental contamination. Proper disposal of waste prevents any future contamination. A comprehensive lead-safety program protects your workers, residents, and the environment.

What Kinds of Waste Are Regulated?

There are many materials found on the job that may be regulated as waste. The most common include:

- Solvents (thinners and organic chemicals).
- Caustics (strippers like Peel-Away®).
- Paints and coatings.
- Lead-containing waste (chips, dust and HEPA filters).

Solvents, strippers, paints, and lead paint are generally classified as hazardous waste. Hazardous waste threatens people and the environment, so it is more stringently regulated than other types of waste. Hazardous waste is regulated under the California Hazardous Waste Control Law. The California Environmental Protection Agency's Department of Toxic Substances Control (DTSC) is responsible for waste law enforcement in California. DTSC has developed regulations that specify methods for management, transportation, treatment, storage, and disposal of hazardous wastes. These regulations are found in Title 22, California Code of Regulations, Division 4.5.

Solvents: Paint thinners, turpentine, and other organic solvents such as methylene chloride strippers are examples of listed hazardous wastes. The chemicals used in these products are on a list that identifies them as hazardous. A listed waste must always be disposed of at a licensed collection center.

Caustics: Some paint strippers are considered "characteristic" wastes. Characteristic wastes are ones with properties that make them dangerous to people and the environment. Strippers are hazardous because of their corrosive (caustic) properties, i.e., a pH greater than 12.5. Waste with a pH greater than 12.5 must always be disposed of at a licensed collection center.

Paints and Coatings: Paints and coatings, oil-based or latex, are regulated in the same way as a listed hazardous waste. Paint must be

disposed of at a licensed collection center. However, reuse or recycling of paint is an acceptable alternative to disposal.

Paint Recycling: Your Best Disposal Option

Paint being transported for recycling is exempt from hazardous waste regulations. You may safely transport used paint in any quantity to a reuse or recycling facility. The local public works, sanitation or engineering department listed in the government pages of the phone book can usually identify reuse and recycling programs in your area. Paint is frequently recycled and reused by:

- Theater groups and housing organizations.
- Paint manufacturers and distributors.
- Local hazardous waste drop off centers.

Note: Many organizations require you to call in advance for an appointment. Some paint drop off centers request that the donated paint be of one color and in volumes greater than one to two gallons.

Lead-containing Waste: Lead-containing waste ***may or may not*** be classified as hazardous depending on the amount of lead in the waste.

How To Determine If Lead-Containing Waste Is Hazardous

There are three options for determining if lead-containing waste is hazardous:

- Perform laboratory testing of the waste.
- Have a paint chip sample analyzed before the job.
- Assume certain types of wastes are always hazardous.

It is important to determine whether lead-containing waste is hazardous. Hazardous waste disposal is expensive, so it is best to avoid creating it when possible. However, if materials are being discarded as ordinary "municipal" waste, you should be able to demonstrate that they are not hazardous. Laboratory testing of waste is the best way to determine if it is hazardous. However, testing may not be necessary if you (1) perform paint chip sampling before the job, or (2) choose to assume waste is hazardous.

1. Laboratory Testing of Waste

This option involves taking samples of your waste and sending them to a laboratory for testing. California regulations specify two regulatory limits for lead. Therefore, waste must pass two different tests to be classified as non-hazardous.

- **The Total Lead Concentration (TTLC).** First, the laboratory must measure the amount of lead in the waste. The weight of lead in the sample is compared with the weight of the entire sample. The test is the same one used by labs to analyze paint chip samples. To pass this test, the Total Threshold Lead Concentration or TTLC must not equal or exceed 1,000 ppm, 1,000 mg/kg or 0.1% lead. This method is sometimes referred to as the ***TTC test***.
- **The Solubility (STLC) Limit**. The second test will measure the amount of lead that can be leached or dissolved out of the material being disposed. This limit was set to protect drinking water from dissolved contaminants. A Waste Extraction Test is run to determine how much lead can be extracted from the waste by a liter of water. To pass this test, the Soluble Threshold Limit Concentration (STLC) or maximum amount of leachable lead must not equal or exceed 5 mg/l. This method is sometimes referred to as the ***STLC test***.

It costs less to determine the TTLC than it does to determine the STLC, and waste **must pass both to be considered non-hazardous**. Therefore, always have the lab check the TTLC first. If it is below the threshold level, then no further testing is needed. If it exceeds the threshold level, then check the STLC.

Advantages. Laboratory testing is the most accurate way to determine if waste is hazardous. If you have a large quantity of waste and believe it is not hazardous, then proving you are below the TTLC and STLC will allow you to dispose of materials in a sanitary landfill - the least expensive option.

Disadvantages. Laboratory testing of waste is expensive. A **waste profile**, complete testing of all the materials being disposed of, can cost $450 for a large and varied waste stream.

2. Paint Chip Laboratory Analysis

Paint chip sampling will tell you the amount of lead in the paint to be disturbed. The method uses the same laboratory analysis as for waste, but here the paint is sampled and not the waste. You can determine the amount of lead in the paint and assume all chips and dust contain the same level. If testing indicates lead is present in concentrations less than 1,000 ppm (0.1% bulk sample), then the waste is not hazardous. **Remember that all waste containing 0.1% lead or greater must be disposed of as hazardous waste**.

Advantages. This is a very accurate method of identifying whether hazardous waste will be generated before you begin work. It will also alert you to the level of worker protection needed.

Disadvantages. Each paint chip sample costs $10-$30 and more than one sample may be necessary if the job involves disturbing different coatings. **The concentration of lead in the chip sample may not be the same as the concentration in the waste**. For example, if lead is contained in the bottom coating, but your surface preparation work only disturbs a top, lead-free coating, then you may be overestimating the amount in your waste.

3. Assume Some Waste Is Hazardous

On jobs where you know lead is present, the simplest approach is to assume some types of waste are always hazardous. This approach can be the simplest and most cost effective when the waste is limited to paint chips and small debris. Remember it is always safe to dispose of lead paint at a hazardous waste facility.

Waste Generally Found to Be Hazardous when Lead-Based Paint is Present:

- Paint chips and dust.
- Vacuum debris bags.
- Sludge or liquid waste from chemical stripping.
- HEPA-vacuum filters or waste water filters.

Waste Generally Found to Be Non-Hazardous When Lead-Based Paint is Present:

- Disposable work clothing.
- Respirator filters.
- Rugs, carpets, and carpet padding.
- Polyethylene (plastic) sheeting- except when used to wrap paint chips.
- Solid components coated with intact, unpeeling paint, such as doors, casements, moldings, and jams.

Advantages. This is a no cost way to determine how to dispose of waste.

Disadvantages. These are general rules, and there may be exceptions. All materials heavily contaminated with lead paint chips or dust may test as hazardous. If you incorrectly assume a hazardous waste is **non-hazardous**, you may be held responsible for improper disposal. From a regulatory perspective, it is always safe to assume a waste is hazardous and dispose of it properly.

What Do You Do With Hazardous Waste on the Job?

- Clean it up immediately.
- Isolate it in a plastic bag.
- Secure it in a sealed container.
- Label waste containers.

Safe disposal of all waste starts with proper cleanup. Proper cleanup requires separating non-hazardous components from hazardous ones. Hazardous waste should be collected and isolated during cleanup. Spent solvents, strippers, and coatings should be sealed in their original containers. Lead-containing debris should be carefully collected and placed in a 6-mil plastic bag. **Waste must be stored in a closed container**. A good method of

containment is to place the plastic bag in a 5-gallon bucket with a lid (used paint buckets are sufficient). For larger jobs, use a 50-gallon drum with a lid.

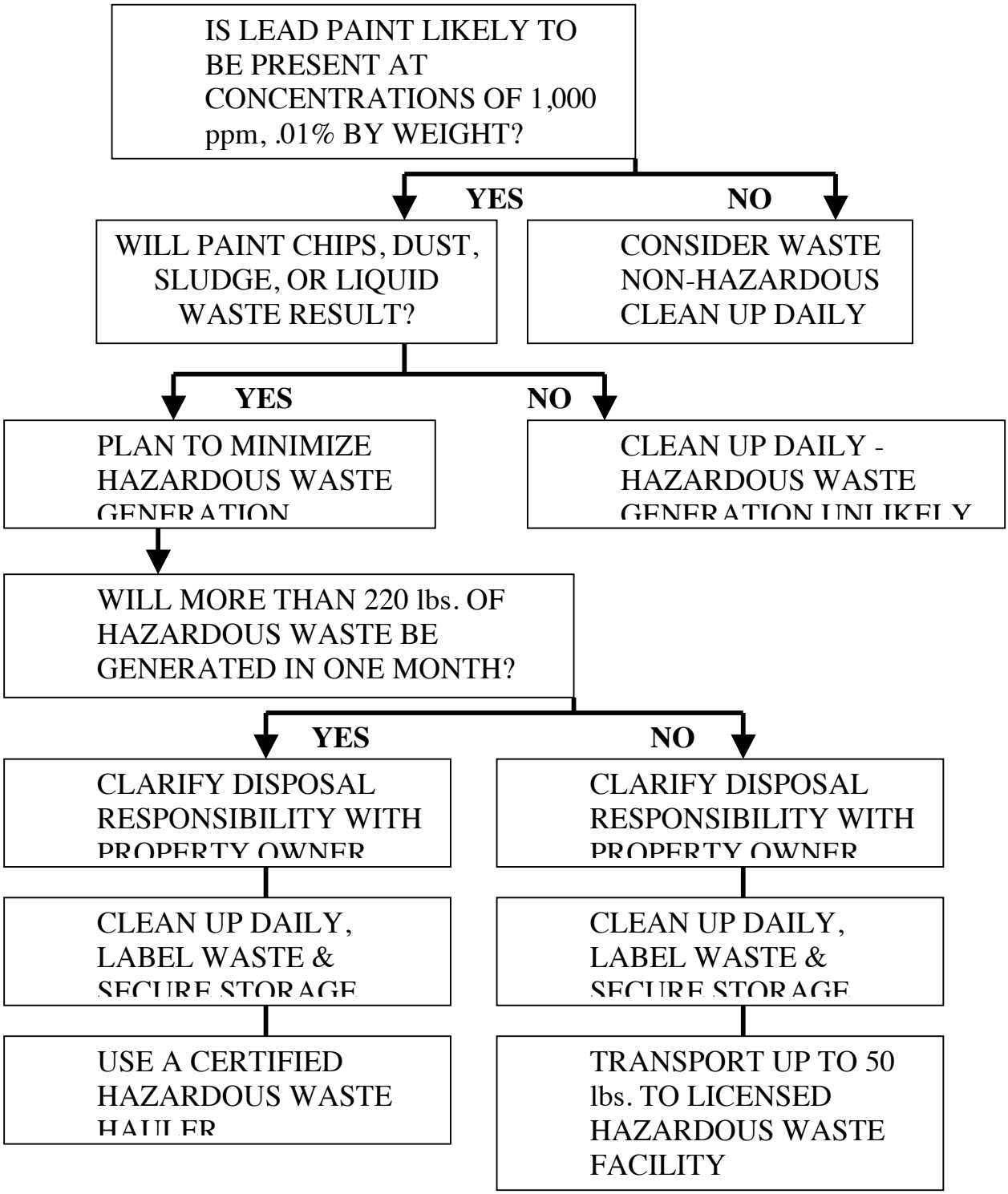
Do not mix different types of hazardous waste in the same container. For example, do not mix caustics with organic solvents. Label containers with a description of the waste. Labeling prevents accidental mixing of chemicals and is often required by the collection center. For example, the bucket or drum containing paint chips and lead waste should have the following warning label:

CAUTION: Lead Paint Wastes

Sealed and labeled waste can then be transported to a licensed disposal facility. All hazardous waste must be packed and secured in a manner that prevents tipping, spilling, or breaking during transportation.

The following flow chart will help you determine the correct disposal scheme for lead waste on the job.

Dealing with Waste on the Job



Who Is Responsible For Disposal of Solvents, Strippers and Coatings?

- The contractor is responsible for hazardous chemical wastes.

You are responsible for the materials you bring to a job. Legally you own the solvents, strippers, and new coatings if these materials can no longer be used. Therefore, you are responsible for their safe and legal disposal. Under federal hazardous waste law, RCRA, the person responsible for disposal is called the generator. Therefore, if you are trying to dispose of chemical wastes, you are a hazardous waste generator. If the wastes are improperly disposed, the generator will be prosecuted.

What Do You Do With Non-Hazardous Waste on the Job?

It is a good idea to also place non-hazardous waste that has small amounts of lead in 6-mil polyethylene plastic bags to prevent contamination of clean areas or transportation vehicles. Place waste in a secure garbage container or dumpster. If you are required to remove waste from the job, transport the wrapped waste to a municipal landfill or transfer station. If a pickup truck is used, cover waste before transport. Never take lead-containing waste to an incinerator because lead may be released as dangerous fume and ash.

Who Is Responsible For Disposal of Hazardous Lead Paint Waste?

- The property owner is responsible for the lead paint waste.

The property owner is always responsible for waste associated with the building. The distinction is between materials that were there before the job began and those you brought to it. For example, you do not own the lead in the existing paint, but the chemicals brought on the job are yours. The property owner can never contract away his or her responsibility for the safe disposal of the hazardous waste from the original lead paint. The property owner is the generator of hazardous lead paint waste.

Is the Contractor a Generator of Hazardous Lead-containing Waste?

- The contractor is not the generator of lead paint waste.
- The contractor may be considered a co-generator of lead paint waste.

In the case of existing lead paint, the contractor is not considered a hazardous waste generator. First and foremost, the property owner is always the generator. If the contractor is asked to dispose of the waste, then the property owner and the contractor are co-generators. If the issue of disposal responsibility is not clarified, the property owner will be considered a generator, and the contractor may or may not be considered a co-generator, depending on the circumstances. A contract hauler is not a generator or co-generator. Consider the following examples:

- **Case 1**: The lead paint waste is hazardous and is disposed of properly by the homeowner at a facility licensed to accept it. The property owner is the generator of a hazardous waste, and the contractor will not be considered a co-generator.

- **Case 2:** The lead paint waste is hazardous and is disposed of properly by the contractor at a facility licensed to accept it. The property owner is the generator of a hazardous waste, and the contractor may be considered a co-generator.

- **Case 3:** Hazardous lead paint waste is disposed of as construction debris at a landfill by the homeowner or a third party. The owner of the property where the waste originated is a generator, and the contractor may be considered a co-generator and potentially liable for fines and penalties.

- **Case 4:** Hazardous lead paint waste is disposed of as construction debris at a landfill by the contractor. The owner of the property where the waste originated is a generator, and the contractor will be considered a co-generator and potentially liable for fines and penalties.

How Can You Protect Yourself from Liability & Violations?

- Before starting the job, have a clear agreement regarding waste disposal responsibility.
- The property owner can dispose of lead paint waste at a local hazardous waste drop-off program.

The best way to protect your business from potential liabilities is to ensure that waste is properly disposed of. When lead paint is present, clarify responsibility for waste disposal with the property owner. You may wish to have a written contract for everyone's protection. Without a written contract, the property owner and contractor are each liable for all violations. Case 3 underscores the importance of having an up-front agreement. Otherwise, both contractor and property owner risk potential liabilities. In cases of illegal disposal, US EPA and Cal/EPA hold liable anybody and everybody involved; ignorance, for whatever reason, is no excuse.

As the generator, the property owner has responsibility for the proper disposal of lead paint waste. One option for contractors is to encourage the property owner to use a hazardous waste drop-off program. Most communities operate hazardous waste programs that allow residents to dispose of waste. The property owner should contact the program in their community for details.

Table—Who Is Responsible for Hazardous Waste?

	Contractor	**Property Owner**
Usually Responsible	• **Thinners** • **Strippers** • **Paints & Coatings**	• **Lead Chips & Dust**
Sometimes Responsible	• **Lead Chips & Dust**	• **Chemicals Existing at the Job**

Remember, if you own it, it's your waste.

What Is The Best Strategy For Safe And Affordable Disposal?

- Minimize the amount of hazardous waste generated.
- Use small quantity generator drop-off programs.
- Avoid accumulating waste.

Consider ways of minimizing waste before you begin the job. For example, reducing the intensity of surface preparation can cut the quantity of lead chips and dust. Keep in mind that paints, thinners, and chemical strippers are also hazardous wastes. Clean brushes and rollers only when necessary.

Recycling and reuse of thinners will cut waste generation and reduce the amount of new material purchased.

If you accumulate no more than 220 pounds of hazardous waste per month, you are considered a ***conditionally exempt small-quantity generator.*** Small-quantity generators may transport up to 50 pounds or 5 gallons of hazardous waste at a time to a licensed collection facility without obtaining permits.

Hazardous wastes should be transported promptly. You may store up to 220 lbs. at your shop, but the best policy is not to accumulate hazardous waste at your business. If you accumulate greater than 220 lbs. of hazardous waste, then you have 90 days to dispose of it. Note the 90 day period begins from the first day any amount of waste is stored. You must get a storage permit to keep waste more than 90 days.

What If I Generate Over 220 Pounds of Hazardous Waste?

- A certified waste hauler is required.

If you routinely accumulate over 220 pounds of waste per month or happen to have a job that results in large quantities of hazardous waste, use a certified hauler to remove it, and advise the property owner of this requirement. Certified haulers already have the necessary permits to transport larger quantities of waste.

Note: EPA has established the following definitions of generator status. Requirements differ depending on the generator status. You can see that under 220 pounds, you are exempt from RCRA. State authorities can tell you if these apply to you.

>2200 pounds (1000 kg) = large quantity generator
220 - 2200 pounds (100 - 1000 kg) = small quantity generator
<220 pounds (100 kg) = conditionally exempt small quantities

Are windows or building components coated with LBP considered hazardous waste?

- Typically, no. Usually they are considered Construction & Demolition Debris (C&DD).

Water Quality/Waste Water Regulations

In California, Regional Water Quality Control Boards set standards designed to limit water pollution. Each region has a specific set of water quality issues, so priorities will vary. City, county or regional authorities develop guidelines designed to achieve water quality goals. These guidelines describe steps that should be taken to prevent pollutants from entering sewers and storm drains.

What Work Can Cause Water Pollution Problems?

- Water from power washing or water blasting.
- Rinse water from cleaning and washing up.
- Any contaminants entering surface waters.
- Any contaminants entering storm drains.

When you power wash or water blast a structure, the runoff will accumulate paint chips and dust. These chips and dust are a concern, especially when they contain lead or mercury. Rinse water used to clean structures and water used by workers to wash and shower can also accumulate paint chips and dust.

Paint chips and dust can seriously contaminate streams, lakes and shorelines. **They should never be allowed to flow directly into surface waters**. Direct contamination of surface waters can result in serious fines and clean-up costs. Wash waters should not be dumped directly into storm drains and you should prevent runoff from carrying chips directly into the sewer system.

Note that there is a difference between a **storm drain** and a **sanitary sewer**. Storm drains discharge directly to rivers, bays, and the ocean. Water entering the sanitary sewer system is first treated then discarded. Most communities have separate storm drains and sanitary sewers. **It is important to prevent lead or other paint waste from entering storm drains**. For accurate information about pollution concerns in surface waters, storm drains, and sanitary sewers, check with your local water pollution control agency.

How Can I Prevent Lead From Entering Storm Drains and Sanitary Sewers?

- Minimize the volume of water used.
- Minimize **debris** flow to sewers.
- Capture chips and debris before they enter sewers.
- Consider contracting out power washing or water blasting work.
- Filter wastewater.

Limiting the volume of water used can reduce the flow to sewers. Try to evaporate wash water before it runs off the job site. Wet debris should be collected promptly and disposed of properly. In addition, try to wash in a direction where water does not flow over existing debris. For example, if the structure is on a grade, begin on the uphill side and work your way down. This approach will prevent washing excess chips into the sewers.

In cases where wash waters will flow to sewers, place cheesecloth, burlap, or other fine filtering material over the drain. The goal is to trap and collect as much debris as possible. When finished washing, remove filter and wet sweep remaining debris out of the gutter and surrounding area. On jobs where lead-based paint is present, dispose of debris as hazardous waste.

Note that professional pressure washers are experienced in containment of runoff. Contract washers are using new equipment designed to collect washer water, chemicals, and loose debris. Consider such a service on jobs where large volumes of lead contaminated rinse water will be generated.

Waste water from washing or showers can be filtered. Low-cost systems are commercially available to filter lead particles from wash water. Filtered water can be drained to the sewage system, but spent filters should be disposed of as hazardous waste.

Air Quality Regulations

The California Air Resources Board (ARB) develops rules to limit air pollution. Local Air Quality Management Districts (AQMDs) and Air Pollution Control Districts (APCDs) enforce pollution rules. Pollution rules do not apply to painting contractors specifically, but instead they apply to

certain types of surface preparation activities. ARB rule 1140 applies to abrasive blasting of painted structures.

What Work Can Cause Air Pollution Problems?

- Abrasive blasting.

Rule 1140 effectively bans uncontained dry abrasive blasting of lead painted surfaces. For example, under California law abrasive blasting of a lead-containing stucco structure must be performed either (1) under containment (shrouded structure), (2) using wet abrasive or by (3) vacuum blasting. Non-abrasive wet methods such as power washing are also acceptable. In general, the rules are designed to control nuisance dust. For more information about rules concerning abrasive blasting, contact the local AQMD or APCD.

Dust control is also important in order to reduce your potential liabilities. There have been a number of cases across the country where contractors have been held liable for contaminating neighborhoods with lead paint dust or chips. Such contamination often requires expensive cleanup. Therefore, in the interest of reducing potential liabilities and staying in compliance with AQMD performance standards, it is important to limit dust generation.

Other Environmental Regulations to Be Concerned With

It is important to be aware that some cities and counties have local ordinances concerning lead paint and other construction activities. Be familiar with local laws in the communities in which you are working. To find out more information, contact the local health department.

For a complete, up-to-date, list of Hazardous Wate Disposal sites in California, visit Stewart Education Services website for a 30-page downloadable file.

Key Facts

Regulatory Agencies/Statutes

- California Hazardous Waste Control Law
- California Environmental Protection Agency's Department of Toxic Substances Control (DTSC) is responsible for waste law enforcement in California.
- Regulations are found in Title 22, California Code of Regulations, Division 4.5.

Regulations Affecting Contractors

- Waste disposal regulations.
- Water quality/waste water discharge regulations.
- Air quality regulations.

Preventing Environmental Contamination

- Use safe work methods that generate little dust.
- Contain paint chips, dust and demolition debris.
- Clean up daily.
- Dispose of waste properly.

Waste that is Regulated

- Solvents (thinners and organic chemicals).
- Caustics (strippers like Peel-Away®).
- Paints and coatings.
- Lead-containing waste (chips, dust and HEPA filters).
- Lead-containing waste ***may or may not*** be classified as hazardous depending on the amount of lead in the waste.

Determine If Lead-containing Waste Is Hazardous

Three options:

- **Perform laboratory testing of the waste.**
  California regulations specify two regulatory limits for lead. Therefore, waste must pass two different tests to be classified as non-hazardous
  - Total Threshold Lead Concentration or TTLC must not equal or exceed 1,000 ppm, 1,000 mg/kg or 0.1% lead. This method is sometimes referred to as the ***TTC test***.

- Soluble Threshold Limit Concentration (STLC) or maximum amount of leachable lead must not equal or exceed 5 mg/l. This method is sometimes referred to as the ***STLC test***.

It costs less to determine the TTLC than it does to determine the STLC, and waste must pass both to be considered non-hazardous. Therefore, always have the lab check the TTLC first.

Advantages— Accurate. If you have a large amount of waste, proving it is below the TTLC and STLC will allow you to dispose of materials in a sanitary landfill - the least expensive option.

Disadvantages— Making many tests can be expensive, well over $450.

- **Have a paint chip sample analyzed before the job.**
  Uses the same laboratory analysis as TTLC and STLC but the paint is sampled, not the waste
  - If testing indicates lead is present in concentrations less than 1,000 ppm (0.1% bulk sample), then the waste is not hazardous. All waste containing 0.1% lead or greater must be disposed of as hazardous waste.

  Advantages— Accurate. It will also alert you to the level of worker protection needed.

  Disadvantages— Each paint chip sample costs $10-$30 and more than one sample may be necessary if the job involves disturbing different coatings. The concentration of lead in the chip sample may not be the same as the concentration in the waste. For example, if lead is contained in the bottom coating, but your surface preparation work only disturbs a top, lead-free coating, then you may be overestimating the amount in your waste.

- **Assume certain types of wastes are always hazardous.**
  Simplest and most cost effective approach is to assume some types of waste are always hazardous when the waste is limited to paint chips and small debris.

Waste Generally Found to Be Hazardous when Lead-Based Paint is Present:

- Paint chips and dust.
- Vacuum debris bags.
- Sludge or liquid waste from chemical stripping.
- HEPA-vacuum filters or waste water filters.

Waste Generally Found to Be Non-Hazardous When Lead-Based Paint is Present:

- Disposable work clothing.
- Respirator filters.
- Rugs, carpets, and carpet padding.
- Polyethylene (plastic) sheeting- except when used to wrap paint chips.
- Solid components coated with intact, unpeeling paint, such as doors, casements, moldings, and jams.

Advantages— This is a no cost way to determine how to dispose of waste.

Disadvantages— All materials heavily contaminated with lead paint chips or dust may test as hazardous. If you incorrectly assume a hazardous waste is **non-hazardous**, you may be held responsible for improper disposal. From a regulatory perspective, it is always safe to assume a waste is hazardous and dispose of it properly.

Disposing of Hazardous Waste

On the Job

- Clean it up immediately.
- Isolate it in a plastic bag.
- Secure it in a sealed container.
- Label waste containers.
- Do not mix different types of hazardous waste in the same container.

Disposal (from chart— *Dealing with Waste on the Job*)
If (1) lead paint likely present at concentrations of 1,000 ppm (.01%) by weight and (2) paint chips, dust, sludge, or liquid waste results, take the following actions:

- Plan to minimize hazardous waste generation

- Clarify disposal responsibility with property owner
- Clean up daily, label wastes and secure storage
- Transport up to 50 lbs. to licensed hazardous waste facility

If more than 220 lbs. of hazardous waste generated in one month—

- Clarify disposal responsibility with property owner
- Clean up daily, label wastes and secure storage
- Use a certified hazardous waste hauler.

Responsibilities

- The contractor is responsible for hazardous chemical wastes.
- The property owner is responsible for the lead paint waste.
- The property owner is always the "generator" lead paint waste.
- The contractor is not the generator of lead paint waste but may be considered a "co-generator."
- A contract hauler is not a generator or co-generator

Strategy for Safe and Affordable Disposal

- Minimize the amount of hazardous waste generated. If you accumulate no more than 220 pounds of hazardous waste per month, you are considered a ***conditionally exempt small-quantity generator.*** Small-quantity generators may transport up to 50 pounds or 5 gallons of hazardous waste at a time to a licensed collection facility without obtaining permits.
- Use small quantity generator drop-off programs.
- Avoid accumulating waste.

Storage

- If you accumulate greater than 220 lbs. of hazardous waste, then you have 90 days to dispose of it. Note the 90 day period begins from the first day any amount of waste is stored. You must get a storage permit to keep waste more than 90 days.

Generating Over 220 Pounds of Hazardous Waste

- A certified waste hauler is required.

Other Conditions

- Windows or building components coated with LBP are not usually considered hazardous waste, but rather Construction & Demolition Debris (C&DD).

Preventing Lead from Entering Storm Drains and Sanitary Sewers

- Minimize the volume of water used.
- Minimize **debris** flow to sewers.
- Capture chips and debris before they enter sewers.
- Consider contracting out power washing or water blasting work.
- Filter wastewater.

Abrasive Blasting Can Cause Air Pollution Problems

California law abrasive blasting of a lead-containing stucco structure must be performed either:

- under containment (shrouded structure)
- using wet abrasive, or
- vacuum blasting

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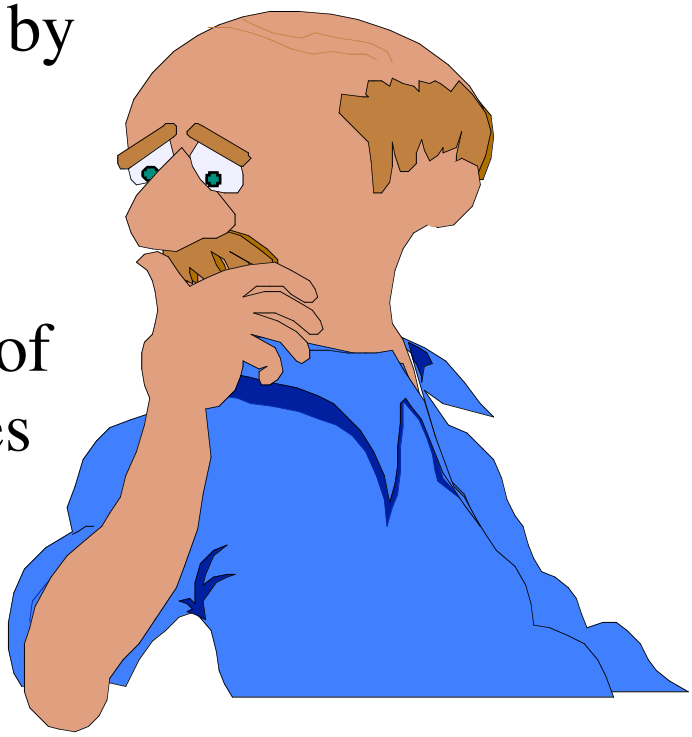
WHEW!!!

Tired or confused by all these laws?



Section 3 gives details on the use of safe work practices to protect residents, workers, and to comply with the law.

The Section 4 will give step-by-step plan to fully implement these regulations.

SECTION 3 • LEAD SAFE WORK PRACTICES

EPA, OSHA, and HUD have developed regulations and suggestions for work practices that provide safety to workers and residents from lead hazard during maintenance/renovation work. The next section discusses these regulations. The *Work Planning Form* provided with this course concisely presents the key facts of this section in a form that is usable by workers out in the field. We suggest that supervisors make the *Work Planning Form* an integral part of their maintenance/renovation program.

CHAPTER 12— Work Practices

This chapter details the specific work practices that provide the greatest safety from lead hazards for workers and residents.

Planning the Job

Qualified supervisors must assess the needs of the job and develop a plan that effectively solves the maintenance/renovation problem while complying with all local, state, and federal regulations.

As discussed in previous chapters, jobs can be divided into two categories: "high-risk" (above the PEL or those that engage in "trigger tasks"), and "low-risk" (below the PEL). It is to the advantage of the contractor to keep the job "low-risk," if possible. The potential harm to workers and residents is reduced, and costs are much lower for "low-risk" jobs.

For jobs that are "low-risk" and not directly regulated by HUD, the supervisor does not need to be state certified. If air monitoring reveals airborne lead above the PEL ("high-risk"), or trigger tasks are used, or the work on HUD regulated property is above the *de minimis*, then the supervisor must be certified by the state.

This section will divide the discussion on work practices between those that are "low-risk" versus those that entail "high-risk" activities. Note, this course does not qualify workers or supervisors to engage in "high-risk" activities.

Planning jobs requires careful consideration of materials, protective clothing, tools and equipment, work methods, clean up, worker decontamination, and waste disposal. Resident notification, if required, needs to be achieved through use of a standardized office procedure and qualified personnel and is discussed in other chapters.

Materials

Certain materials are essential for all jobs. These can be used only one time and then disposed.

- Plastic sheeting (at least 6-mil polyethylene).
- Blue Tape (used to secure plastic sheeting and will not damage painted surfaces)
- Rags (damp)
- Paper Towels
- Plastic Bags (disposing of contaminated items and must be at least 6-mil polyethylene)
- Hazardous Waste Labels (for bags, if needed)
- Towelettes (for cleaning hands and face)
- Tack Pads
- String Mop Head (disposable and for large areas)
- All-Purpose Cleaner (or other appropriate cleaning solution for lead)

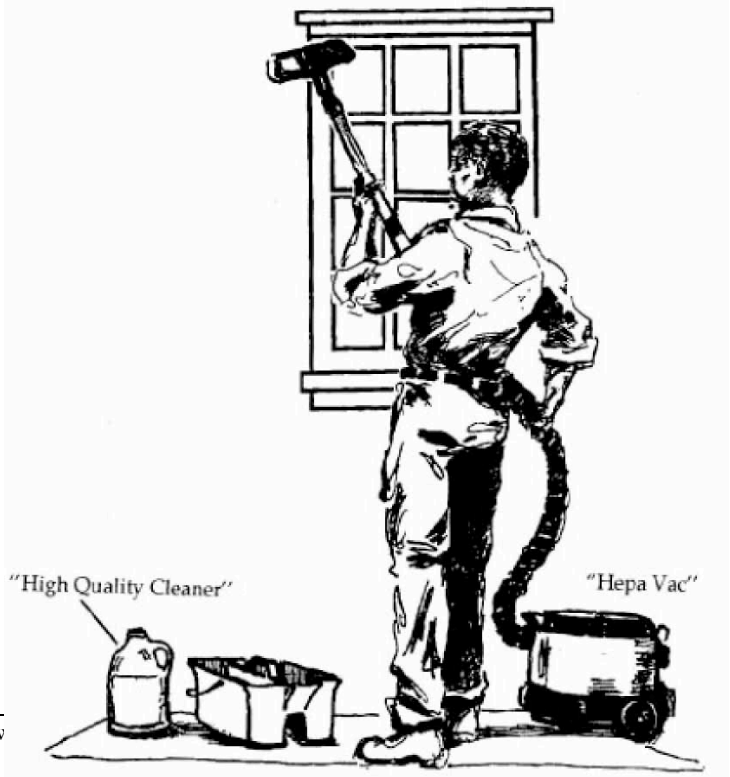
Equipment

If properly cleaned, the following equipment may be reused:

- Signs and Yellow Caution Tape
- Spray Bottle or Commercial Mister
- Stapler
- Scrapers
- Utility Knife
- Broom (wet sweep only)
- Dust Pan (wet debris into plastic bags)
- Mop Handle
- Buckets

For "high-risk" jobs, specialized equipment includes:

- HEPA Vacuum (recommended for all lead work but required for "high-risk" tasks) (See **Appendix—HEPA Directory** page 417 for a list of vendors



who can provide a HEPA Vacuum.)
- Power Tools with HEPA Vacuum attachments
- Mini Containment

Personal Protection

These include:

- Nonskid Shoe Coverings (disposable)
- Gloves (disposable and appropriate for the job)
- Latex/Rubber Gloves (appropriate for the job and cleanable)
- Coveralls (disposable or recyclable)
- Protective Eye Wear

For "high-risk" jobs, workers also need:

- Disposable Full-Body Coveralls/Recyclable Clothing
- Respirators w/HEPA Filters

Work Practices

The discussion of work practices will be structured under the slogan, *Work Smart, Work Wet, Work Clean*.

Work Smart

Inform Residents— A supervisor or office personnel will determine if residents must be notified of lead hazard before work begins. Workers may be part of this process and asked to provide notification and obtain signatures from residents.

Personal Protective Clothing— Personal Protective items, like materials and equipment, must be provided by the employer at **no cost to the employee.**

Containment— The major strategy to working smart is to contain the hazard. Containment may include a combination of warning signs, plastic sheeting, and special work practices; including erecting full enclosures for "high-risk" jobs. Containment procedures must be used in every job.

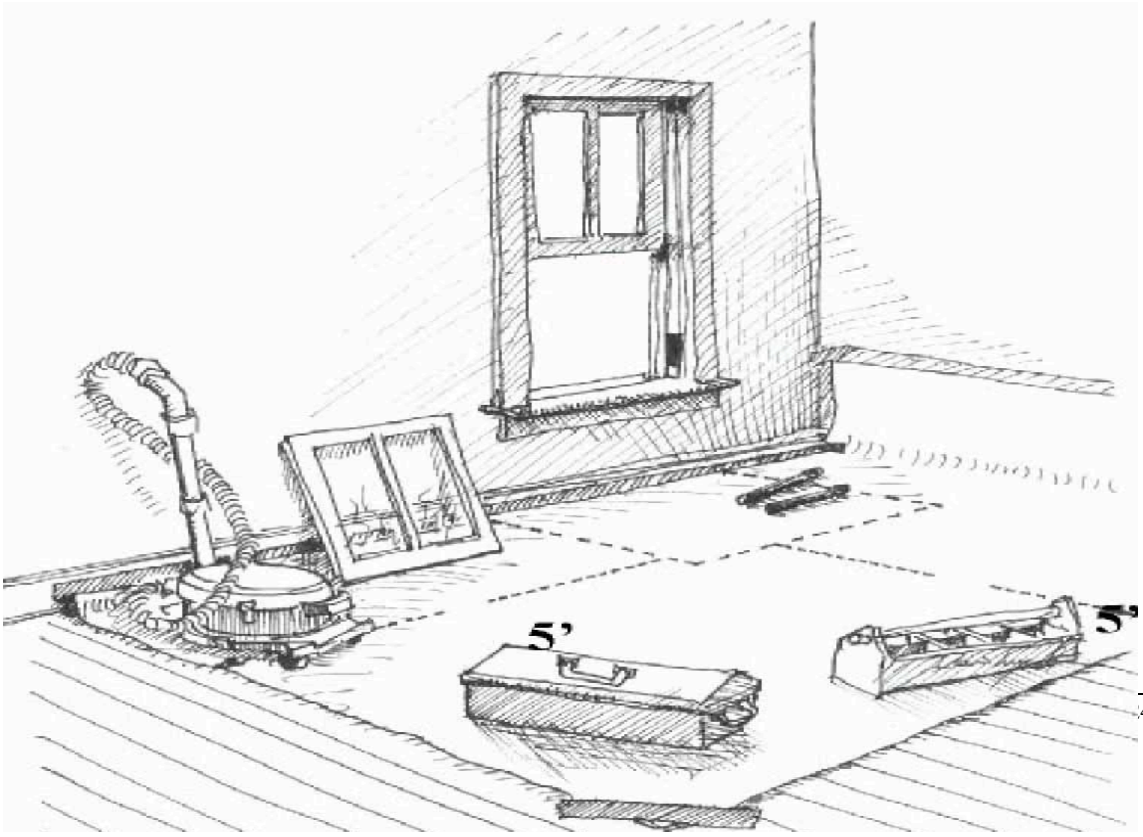
Restrict Access— Workers who are especially trained and involved with lead maintenance/renovation should be the only people allowed into the work area. Special effort must be made to keep children away. To restrict access to the area:

- Schedule the work to minimize the time residents, especially children, are around the work area.
- Put up warning signs (required for "high-risk" jobs)
- Cordon off the area off with yellow caution tape.
- It may be necessary to erect a physical barrier if the caution tape is not sufficient at keeping unauthorized people out.

Containment Using Plastic Sheeting— Polyethylene ("Poly") of 6 millimeter or greater thickness is one of the most important ways to control lead hazards during maintenance/renovation work. The plastic sheeting contains the dust and helps in final cleanup.

For indoor jobs of "low-risk":

- Poly should be extended at least five feet in all directions from the



work area.

- Poly should be secured to walls using non-destructive (blue) tape or staples.
- Furniture may be moved or covered with poly.
- If the work is done on the ceiling, it may be necessary to cover the entire floor with poly. In these cases, the poly needs to be secured the entire length of the wall using non-destructive (blue) tape. Once carpets become contaminated, it is virtually impossible to get out the lead.
- Place a "catch" bag under work area when possible.

For "low-risk" outdoor jobs:

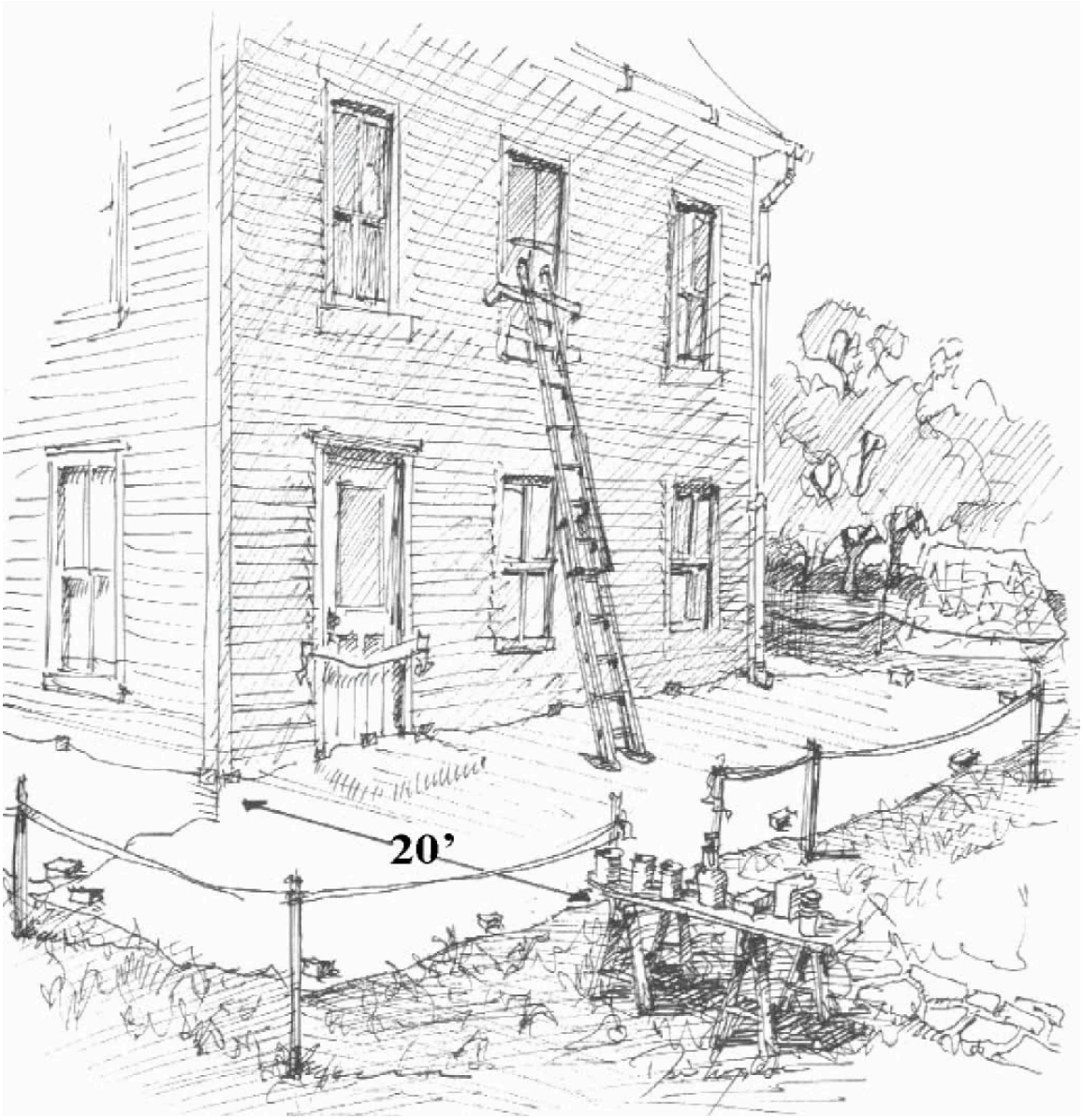
- Poly should be extended at least ten feet in all directions from the work area. This may include covering bushes and landscaping.
- Cover and seal nearby windows with poly.
- If it is windy, postpone work.
- If it begins to rain, stop work and immediately clean up.
- If working from a height (high up the side of a building), the poly needs to be extended father than the recommended ten feet.

For "high-risk" indoor jobs:

- Two layers of poly should be extended through the entire room. This way, at the end of the day, the top layer can be removed and disposed and a new layer applied; thus not contaminating the floor.
- Doorways and windows should be sealed with poly.
- An airlock flap may be necessary over one door to give workers access.

For "high-risk" outdoor jobs:

- Besides extending poly ten feet in all directions, a vertical containment may be necessary to control the dust. Seal all windows and doors with 20 feet of the work area.



Water Runoff— If a particular job creates larger amounts of water runoff, it is important to capture the water since it may contain lead paint or chips. Building a "berm" around the work area may contain the water. This is achieved by placing 2x4's around the area, placing poly over the area and beams. This creates a small pool to capture the water runoff. At the end of the workday, the water is collected using a special HEPA vacuum designed to pick up water or with a mop. The water is disposed of as hazardous wasted. The poly is rolled up, sealed with tape, and disposed of properly.

HVAC— The heating, ventilation, and air conditioning system can easily spread lead dust.

For "low-risk" jobs:

- Turn off all HVAC vents within five feet of the work area. This may require placing poly over the vents and taping them shut.

For "high-risk" jobs:

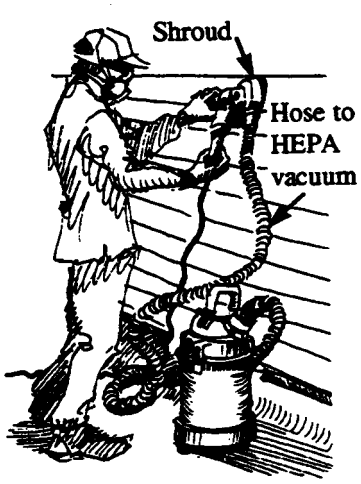
- Besides placing poly over the vents and taping them shut, the entire HVAC system may need to be shut down.
- Each system is different. Some systems are controlled by a switch or key, others are computerized and may be reset.
- Use proper lockout/tagout procedures.

Working Wet

Keeping dust down is the key to working safe and at the lowest cost. *Working Wet* is the primary work method used in any lead-safe program.

Working wet means:

- The work area is misted using a spray bottle or commercial sprayer.
- Misting continues throughout the entire job.
- The water is allowed to soak into the material before it is scraped, sanded, drilled, sawed, planed, or pried.
- Lead debris and chips are kept wet and are cleaned up as the job progresses, not just at the end of the job.
- Workers should not use too much water; otherwise runoff may damage the building and cause additional cleanup problems.
- **Never use water around electrical boxes or outlets**, whether the power is on or off.
- Watch out for concealed wires in walls and ceiling.
- Shaving foam is suggested to be used during drilling.



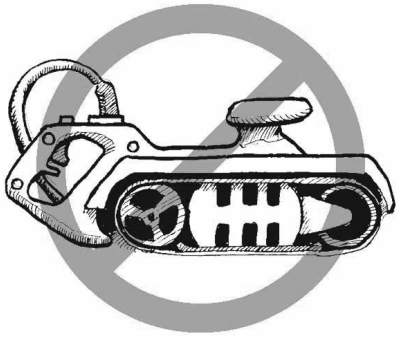
Removing Paint— Paint can be removed by either scraping or sanding, use of power tools, heat, or chemicals. Each has its advantages and disadvantages.

- Scraping or sanding is the simplest. Dust is kept down using wet methods.
- A power grinder or sander can work fast and cover a large area, but they also may create very high levels of lead dust. Cal/OSHA classifies the use of a power tool as a "trigger" task and only certified employees may use them. Power tools require the attachment of HEPA vacuum.
- Heat guns help soften old paint so they can be smoothly scraped off. The use of an open flame (torch) or a heat gun above 1100 degrees Fahrenheit is a prohibited practice. If a heat gun is used, it should not be set above 1000 degrees otherwise toxic fumes are released. Workers should guard against the danger of fire and have a fire extinguisher readily available. The use of a heat gun is a "trigger" task and requires certified workers only.
- Chemical strippers are an excellent way to remove paint from intricate shapes. It is acceptable to use chemical strippers to remove lead paint. Methylene chloride strippers can never be used since they are a prohibited by law. Chemical strippers are very caustic and workers need to protect themselves with gloves, aprons, gauntlets, goggles, face shields, and other protective clothing. An emergency eyewash and safety shower should be available. Also, chemical strippers produce chemical waste that is classified as a hazardous waste and must be disposed of properly.

Prohibited Work Methods— The following chart (excerpted from page 9-10, *Lead Paint Safety: A field guide for painting, home maintenance, and renovation work*) describes the types of paint removal methods that are legally prohibited by HUD for use during lead-hazard reduction treatments.

PROHIBITED WORK PRACTICES

Don't Use Power Sanders or Grinders Without HEPA Vacuum Attachment.
These machines create a lot of dust that can contaminate a building and the ground around a building endangering workers, neighbors, and residents.



Controlled Sanding or Grinding With HEPA Vacuum Attachment is Acceptable.
If the sanding or grinding machines are "shrouded," which means surrounded with a barrier that prevents dust from flying out around the perimeter, AND attached to a HEPA vacuum, they can be used. Because some dust may still blow out around the perimeter, workers near the machine should wear half-mask respirators rated by NIOSH as N100 (or HEPA) at a minimum. Also, the work area must be completely isolated if the machine is used inside. Because these tools can create high levels of dust and require additional precautions, their use is beyond the scope of this guide.

Don't Use Open Flame/High Heat Removal of Paint.
There is no acceptable use of an open flame torch or high temperature heat gun (above 1100 degrees F) to remove paint.

- It produces toxic gases that a HEPA dust canister on a respirator cannot filter out on its own (a second, organic filter is necessary).
- It creates high levels of very toxic dust that is extremely difficult to clean up.
- It can burn down a house.

Do Use a Heat Gun on Low Setting.
A heatgun set below 1100 degrees F may be used with caution. It is recommended for small areas only, such as the edge of a door, the top of a window stool, or the friction surface of a window jamb.

Don't Use paint Strippers Containing Methylene Chloride.
Many paint strippers are potentially dangerous. Strippers containing methylene chloride should not be used because its chemical is extremely toxic and is known to cause cancer.

Other Chemical Strippers with Appropriate Precautions Are Acceptable.
Chemical strippers without methylene chloride are safer to use, as long as the precautions printed on the container are followed. Take extra precautions to mask areas near stripping.

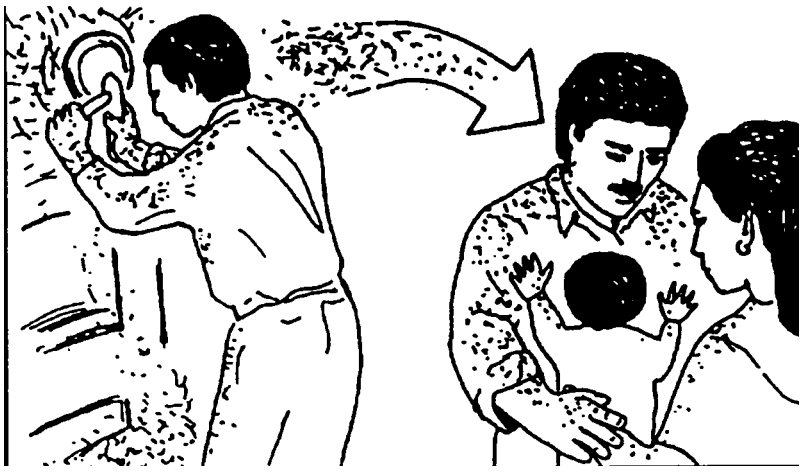
Don't Use Uncontained Hydroblasting.
Removal of paint using this method can spread paint chips, dust, and debris beyond the work area. This result makes it difficult to clean up these hazards at the end of the job.

Contained Pressure Washing is Acceptable.
Removal of paint using contained pressure washing within a protective enclosure to prevent the spread of paint chips, dust, and debris may be done. Because this method requires additional precautions that are beyond the scope of this guide, it should only be used by certified lead abatement workers.

Don't Use Uncontrolled Abrasive Blasting.
This work method can also spread paint chips, dust, and debris beyond the work area. This results in a difficult-to-clean-up situation at the end of the job.

Contained Blasting is Acceptable.
Contained abrasive blasting within a protective, locally exhausted enclosure to prevent the spread of paint chips, dust, and debris may be sued. Because this method requires additional precautions that are beyond the scope of this guide, it should only be used by certified lead abatement workers.

Avoid Extensive Dry Scraping or Sanding.
Extensive dry scraping or sanding create large amounts of paint chips, dust, and debris that are hard to contain.



Use Wet Methods of Limited Dry Scraping and Sanding.
Mist surfaces before scraping and sanding. Continue to mist while working. Dry scraping and sanding of very small areas (for example, around light switches or outlets) may be done if the surfaces below the areas are covered with protective sheeting. These methods should be avoided on areas larger than 2 square feet per room, and workers must have adequate respiratory protection.

A warning sign must be posted at each entry to a room where hazard reduction activities are conducted when residents are present, or at each main and secondary entryway to a building from which residents have been relocated. In the case of exterior hazard reduction activities, the sign shall be posted where it is easily read 20 feet from the edge of the hazard reduction activity worksite. Each warning sign shall meet the OSHA standards 29 CFR 1926.62 (m), except that it shall be posted irrespective of employees' lead exposure and, to the extent practicable, provided in the residents' primary language.

Unsafe Work Practices— Besides the prohibited work practices, some other practices are simply unsafe. These include:

- Disposing waste in resident trash.
- Washing in resident's sink.
- Disposing of wastewater down resident's sink, bathtub or outside on the resident's lawn or yard. It may be acceptable to pour wastewater down the resident's toilet; but check with local water management district.
- Vacuuming with household vacuum.
- Misting of water near electric outlets, fixtures, or equipment.
- Dry sweeping.
- Use of compressed air to blow off dust.
- No dust masks for "high-risk" jobs.

Unsafe Personal Practices— Employees are never to:

- Eat, smoke, apply makeup or chapstick while on the job.
- Touch resident's property (such as the phone) before completely cleaning hands and face.

Carpet Removal— Removing an old carpet can be very dusty and, therefore, a "high-risk" job. However, if wet methods are used, the level of risk can be significantly reduced. To remove a carpet:

- Mist the top of the carpet thoroughly.
- Loosen the carpet from the tack strips or glue area.
- Cut carpet into manageable sizes with utility knife.
- Roll carpet pile side in while misting the back of the carpet.
- Repeat this procedure with the padding.
- Place carpet and padding pieces in 6 mil poly bags, seal with tape, and dispose.
- Once the carpet is removed, clean the floor by:

- Vacuuming with a HEPA vac.
- Wet mop the entire floor and baseboards.
- Rinse mop the entire floor and baseboards.
- HEPA vac the floor one more time.

Work Clean

Cleaning up after a maintenance/renovation job is crucial. Working on surfaces that have lead-based paint on them creates a residue of lead dust that is difficult to remove. If left in the work area, it can quickly spread throughout a resident's home or yard.

"Low-risk" jobs should be cleaned by:

- Placing large debris in poly bags (6-mil minimum).
- Tools wet wipe.
- The poly film is first misted, folded "dirty side in," then placed in a poly bag for disposal.
- The work area is wet wiped with a cleaner, then rinsed with clean water. The rags are wrung out into a separate bucket. This is known as the 3-bucket system. Depending on the level of dust, it is sometimes recommended to "wet, wipe, and toss" each rag.
- Besides the work area, clean and rinse two feet beyond the area covered by the poly.
- Place all soiled rags and paper into a poly bag; use tape to seal with a gooseneck (a more secure way to close a bag).
- Remove all materials, bagged debris, and tools from work area.
- Dispose of bagged debris properly.

"High-risk" jobs follow the same procedures as "low-risk" jobs with the additional steps:

- Contaminated tools are placed in poly bag for cleaning back at the shop.
- Containment structures and disposable coveralls and gloves are placed on poly and folded "dirty side in."
- HEPA vac before wet wiping with cleaner, then HEPA vac again after the final rinse wipe.

<u>Personal Clean Up (Decontamination)</u>— Besides cleaning the work area, workers

need to clean up after performing jobs that expose them to lead-based paint. Steps to be taken include:

- Vacuum clothing with HEPA vacuum.
- Hands and face are wiped with towelettes, which are then placed in the disposal bag.
- Place used coveralls, shoe covers, and gloves either in a disposal bag (if disposable) or a bag taken back to the shop for the employer to have professionally cleaned (if recyclable).

For "high-risk" jobs, workers must also:

- shower with soap
- clean tools and equipment away from the work area

Quality Control

On small, "low-risk" jobs, a visual inspection is probably all that is necessary. On "high-risk" jobs, clearance wipe samples are required and must be conducted by certified personnel. Employers may want to perform wipe samples on about 5% of the low-risk jobs to evaluate the effectiveness of lead-safe work practices and containment.

If the work requires HUD Clearance, the following must be completed before residents can return:

- Visual assessment to assure that there aren't any deteriorated paint surfaces or visible accumulations of dust or debris remaining after the specified work has been done
- Dust testing to assure that the standards for lead in dust have been complied with. Dust testing cannot occur until after the housing has passed the visual assessment. If dust lead levels equal or exceed the standards, there should be another cleaning of the spaces and surfaces represented by the failing dust samples.
    - Lead in dust (clearance/risk assessment)

Floors	40 μg/ft^2
Interior window sills	250 μg/ft^2
Troughs (clearance only)	400 μg/ft^2

    - Lead in bare soil (risk assessment)
        Play areas 400 μg/g
        Other soil 1,200 μg/g

The clearance examiner must prepare and sign a report documenting that the housing passed clearance. The clearance examiner must be a person who did not perform the hazard control work and who is certified (or licensed) to perform lead-based paint inspections, risk assessments or clearance examinations in the State or Indian country in which the housing is located. Clearance is required for ALL jobs, except for single-family mortgage insurance and "small jobs." A small job is any job that does not meet *de minimis* requirements (described in previous chapter).

Quality Assurance

At the end of a job, workers should verify that:

- Work was properly completed as directed.
- Work areas were properly cleaned.
- Contaminated debris was properly bagged, sealed, labeled, and removed from site.
- Contaminated tools, materials, and equipment were removed from residence for proper cleaning.
- Resident's property was returned to original place.
- Residents notified the job was completed successfully
- Clearance testing (if required) results given to residents.
- Other problems noted to supervisor.

Waste Disposal

The supervisor for the job will determine how the waste generated by the job is to be disposed (see Chapter 11).

Key Facts

See *Work Planning Form* for Key Facts.

SECTION 4 • LEAD SAFE COMPLIANCE PLAN

The legal requirements for implementing a Lead-Safe Compliance Plan originate in Title 8 and with HUD. We give the regulation in its entirety to better acquaint readers with its requirements. The next chapter integrates these requirements, step-by-step, into one compliance plan.

From Title 8 Section (2) Compliance program.

(A) Prior to commencement of the job each employer shall establish and implement a written compliance program to achieve compliance with subsection (c).

(B) Written plans for these compliance programs shall include at least the following:

1. A description of each activity in which lead is emitted; e.g. equipment used, material involved, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices;
2. A description of the specific means that will be employed to achieve compliance and, where engineering controls are required, the engineering plans and studies used to determine the methods selected for controlling exposure to lead;
3. A report of the technology considered in meeting the PEL;
4. Air monitoring data that documents the source of lead emissions;
5. A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.;
6. A work practice program which includes items required under subsections (g), (h) and (i) and incorporates other relevant work practices such as those specified in subsection (e)(5); 7. An administrative control schedule required by subsection (e)(4), if applicable;
8. A description of arrangements made among contractors on multi-contractor sites with respect to informing affected employees of potential exposure to lead and of regulated areas.
9. Other relevant information.

(C) The compliance program shall provide for frequent and regular inspections of job sites, regulated areas, materials, and equipment to be made by a supervisor.

(D) Written programs shall be submitted upon request to any affected employee or authorized employee representatives, to NIOSH, and shall be available at the worksite for examination and copying by NIOSH.
(E) Written programs shall be revised and updated at least every 6 months to reflect the current status of the program.

CHAPTER 13— Step-by-Step Compliance Plan

Every owner of residential rental property and every company involved in performing maintenance, renovation, or construction on residential property needs to have a Lead-Safe Program. The Program needs to establish policies and procedures to address lead hazards to help:

- Protect employees and residents from lead poisoning.
- Respond to the concerns of residents and employees.
- Comply with the law. Several state and federal laws require residential property owners and maintenance/renovation/construction companies to control lead.
- Avoid unnecessary costs. By knowing the extent of the lead hazard, owners can determine the most cost-effective way to deal with the problem. Remember, unsafe practices can create new problems that have to be corrected later at greater expense and, frequently, opens owners to possible legal liability.

Each item marked with an → requires a response.

Program Manger

Owners and management companies need to designate someone to oversee the Lead-Safe Program. The Program Manager should be given sufficient authority and resources to do the job effectively. The manager should be familiar with the company's existing policies and procedures, particularly those related to health and safety. The Program Manager also needs to be knowledgeable on (1) Injury and Illness Prevention Program, (2) Hazard Communication Program, and (3) Medical Surveillance Program. The role of the program manager is to design, implement, and document the lead-safe program.

This person should have training from a state-accredited lead-training program and be DHS-certified at least at the level of Lead Supervisor.

→ Has a Program Manager has been appointed? Yes ☐ No ☐

Name _____ Title _____

→ The Program Manager reports to:

Name _____ Title _____

→ Does the Program Manager have DHS lead certification? Yes ☐ No ☐

Level _____ Renewal date _____

Elements of a Lead-Safe Program

Lead should be dealt with the same way as any other health and safety problem: identify, evaluate and control the hazard, assess the work, and document what was done.

Two major areas of a Lead-Safe Program:

General Programs— Establish all programs that apply to every job and must be in place before work begins:

- Sale/Rental Disclosure
- Occupational Lead Poisoning Prevention Program (OLPPP)
- Injury and Illness Prevention Program (IIPP) [including a Medical Surveillance Program]
- Hazard Communication Program
- Waste Management
- Compliance Plan
- Abatement Programs

Work Programs— Procedures required to assure specific jobs comply with the law—

- Identify Lead Hazards
- Analyze Risk Level
- Personnel Qualifications and Training
- Communicate with Owners/Residents
- Work Materials and Equipment/Tools
- Employee Protections
- Use Safe Work Practices
- Waste Management
- Quality Assurance
- Assess the Quality
- Document and Evaluate the Program

• Outside Contractor Qualifications

These elements have been discussed in great detail in previous chapters. They are presented here in outline form for ease at checking off completed items.

General Programs

Sale/Rental Disclosure
Upon the sale of residential property, the owner is required to disclose to a potential buyer any known lead on the property. Likewise, any known lead must be disclosed to those renting residential property. EPA requires the distribution of their pamphlet, *Protect Your Family from Lead in Your Home*.

→ Give property information:

Address of Property _____

Name of Buyer/Lessee _____

Date of Transaction _____

Chapter 5 gives specific guidelines as to when and how to implement this policy. The guidelines are summarized here:

Requires disclosure of information concerning lead-based paint upon transfer (buying or leasing) of residential property that was constructed before 1978. Exemptions include:

- "0-bedroom dwellings," such as lofts, efficiencies, and studios. The Interpretive Guidance issued by HUD included rental rooms in fraternity and sorority houses as "0-bedroom dwellings."
- Housing designated for the elderly and the handicapped unless children reside or are expected to reside there.
- Leases of target housing found to be lead-free by a certified inspector.
- Renewal of existing leases for which the information required has already been disclosed **and** there is no new information.

- Short-term leases of 100 days or less where no lease renewal or extension can occur.
- Sales at foreclosure.

For other conditions and exemptions, see Chapter 5.

→ Is disclosure required before sale or lease? Yes ☐ No ☐

→ If yes (all the below should be "yes")—

a. EPA pamphlet given to buyer/lessee? Yes ☐ No ☐

b. Any known lead hazards disclosed to buyer/lessee, including giving records? Yes ☐ No ☐

c. Were disclosure and warning language attached to sale or lease contract? Yes ☐ No ☐

d. Are documents in storage for a minimum of 3 years? Yes ☐ No ☐

Occupational Lead Poisoning Prevention Program (OLPPP)
Every contractor or business engaged in plumbing, heating, air conditioning, painting and paper hanging, roofing, siding with sheet metal work, wrecking and demolition work, and other specified jobs in the real estate industry must register and pay a fee to OLPPP.

→ Have you filed Fee Form 8484 with the California Department of Health Services as required by OLPPP? Yes ☐ No ☐

→ If yes, give date of registration _____.

→ If not, did you file a waiver form? Yes ☐ No ☐

→ What reason did you give for the waiver _____. (See Chapter 6 for details of this application process and its waiver.)

If you have not filed Fee Form 8484 or requested a waiver, and engage in any of the work activities specified above on residential property where there is lead or where lead is suspected to exist, you are in violation of the law.

Illness and Injury Prevention Program (IIPP)
An IIPP must be established to cover all employees, including those who are potentially exposed to lead. See the **Appendix**, Cal/OSHA Injury and Illness Prevention Program Standard—Summary, page 330, for a summary of these requirements.

→ Has an IIPP been set-up? Yes ☐ No ☐
→ If yes, attach a copy of the program.

If an IIPP has not been implemented, and the business engages in any of the work activities specified above on residential property where there is lead or where lead is suspected to exist, you are in violation of the law.

In conjunction with the IIPP, a Medical Surveillance Program may need to be established to monitor blood levels of employees exposed to lead (see **Appendix**, Title 8 California Code of Regulations, Appendix C, Medical Surveillance Guidelines, page 392). This includes the possibility of a

Medical Removal Protection (MRP) for those cases were employees blood-lead levels exceed the legal maximum.

The basic conditions for establishing a Medical Surveillance Program include:

- Workers who are exposed to airborne lead at or above the Action Level of 30 $\mu g/m^3$ for more than 30 days in any consecutive 12-month period.
- Employees who begin lead work (at any exposure level).
- When the level or airborne lead is unknown, the Lead in Construction standard requires the presumption of lead above the Action Level until proven otherwise.
- Workers are exposed at or above the Action Level for even one day.
- Workers engage in "trigger" tasks.

→ Are you required to establish a Medical Surveillance Program and has it been set-up? Yes ☐ No ☐

→ If yes (all the below should be "yes")—

a. Copy of the program attached? Yes ☐ No ☐

b. Is the lead-specific medical program under the supervision of a licensed physician who is knowledgeable about the Cal/OSHA lead in construction standard? Yes ☐ No ☐

c. Have employees taken "base-line" medical tests? If so, attach or state where they are filed. Yes ☐ No ☐

d. Have employees been notified of their test results? Yes ☐ No ☐

e. Are employees with blood levels at 50 $\mu g/dl$ or above removed from further exposure to lead, and provided with alternate work or medical leave with full pay and benefits? Yes ☐ No ☐

→ If a Medical Surveillance Program has not been established, state why you are exempt from the program _____.

Worker Training and Certification

Workers must be trained and certified on lead.

"Low-risk" Jobs

→ Have all employees who perform maintenance, renovation or construction on residential property that is known to contain or suspected to contain lead hazard, received basic awareness training? Yes ☐ No ☐

→ If yes, attach copies of the employees attendance, or documents (such as "Notice of Completion" from HUD training providers) proving their training. Or, state where these files are kept _____.

→ Is there a plan in place for the annual training of employees to update them on lead hazard? Yes ☐ No ☐

If "no" to any of the above, you are in violation of the law since "basic training" and annual re-training (refresher course) is a legal requirement.

"High-risk" Jobs

→ Are employees who engage in "high-risk" jobs (above the PEL, engaging in "trigger tasks," performing "Abatement," and other conditions) certified by the state? Yes ☐ No ☐

→ If yes, attach copies of employees' certification proving their training. Or, state where these files are kept _____.

Workers <u>cannot</u> engage in "high-risk" jobs without state certification.

Outside Contractor for "High-risk" Jobs

→ If an outside contractor is providing service, attach copies of workers and supervisors training and/or certification.

<u>Hazard Communication</u>
A Hazard Communication program must be established whenever employees are potentially exposed to hazardous materials, including lead. See the **Appendix**, Cal/OSHA Hazard Communication Standard—Summary, page 331, for a summary of these requirements.

→ Has a Hazard Communication program been set-up? Yes ☐ No ☐

→ Have employees been: notified of the hazards, given written materials explaining the hazards, and trained in their safe use?
Yes ☐ No ☐

→ If yes, attach a copy of the program, the applicable MSD (see **Appendix**, MSD—Lead Painted Building Debris, page 298), and evidence employees have been trained on these materials.

If the business engages in any of the work activities specified above on residential property where there is lead or where lead is suspected to exist and the Hazard Communication program has not been implemented or employees trained, you are in violation of the law.

Waste Management

Under certain circumstances, lead is considered a hazardous waste. As such, state law regulates its ownership and disposal. A detailed plan, along with reporting to the state, is required. Chapter 11 gives extensive details concerning environmental protections and waste management.

→ Do you have a waste management plan implemented? Yes ☐ No ☐

If yes, attach copy of plan. If not, explain why you are exempt from the legal requirements _____.

Compliance Plan

A compliance plan is required for all businesses engaged in work that may create lead hazard.

→ Has a Compliance Program been set-up (this form)? Yes ☐ No ☐

→ If yes, state where the Program is filed _____.

If "no," you are in violation of the law.

Abatement Programs

Abatement Programs (intent of permanent— 20 years or longer— removal of lead hazard) requires a host of additional conditions including state lead-certified workers. The first step is to file form 8552 with the Department of Health and Safety. If you do not engage in lead abatement but are required to perform a Clearance Test (such as on HUD jobs), you are also required to submit the same form.

→ If you engage in lead abatement, have you filed Form 8552 with the Department of Health Safety? Yes ☐ No ☐

→ In non-abatement work situations where you perform Clearance Testing, have you filed Form 8552 with DHS? Yes ☐ No ☐

There are no exceptions to these requirements.

Work Programs

The previous section discussed the general programs a business would need to implement if it intended to provide maintenance, renovation, or construction services to residential real estate where lead was present.

This section discusses the steps needed to comply with each maintenance, renovation, or construction job. Every time a job comes up, this section needs to be reviewed and updated. The *Work Planning Form* provides workers in the field with explicit directions for performing lead-safe work practices.

→ On the *Work Planning Form*, fill out under Planning the Job with the building information (code, address, unit, work order number, resident name and telephone).

Item #1—Identify Lead Hazards

The first step in any maintenance, renovation, or construction job is to identify the sources of lead hazards.

→ Lead hazards can be identified a number of ways. Check all that apply:

☐ Collect and Review Property Records. Existing records can give a first indication of which properties are likely to have lead hazards. Identify residential property that was built before 1978 and check its painting history, dates of plumbing work, and previous air, soil, and water sampling records, if any.

☐ Survey Paint and Soil at Property. Paint and soil should be visually inspected for lead hazards at all target locations. Visual inspections may be done by maintenance personnel having the minimum of lead awareness training. For property to which the HUD regulations apply, this inspection must be carried out by certified personnel. Repeat these surveys every few years or after any major damage.

By law, a "lead hazard" is defined as deteriorated lead-based paint, lead contaminated dust, lead contaminated soil, disturbing lead-based paint or presumed lead-based paint without containment, or any other

nuisance that may result in persistent and quantifiable lead exposure.

☐ Test Paint and Soil Where Appropriate. The only way to know for sure if there is lead in paint is to test it. However, Title 17 of the California Code of Regulations says that all paint in residential property built before 1978 is "presumed lead-based paint." An alternative to testing is to presume the paint contains lead and always use lead-safe work practices.

Soil near buildings built before 1940 should be tested if it is accessible to children. If testing isn't feasible, and children use the area, cover the soil or deny access to the area.

☐ Test Water at All Residential Property. Drinking water should be tested for lead if records do not indicate previous testing, or not of sufficient age to be exposed to the problem. New tests should be done after plumbing renovations.

→ If the property was built before 1978, and there is no test evidence to disprove the presence of lead, mark "yes" on the *Work Planning Form* question number 1, **Identifying Lead Hazard**— Year of Construction.

Item #2—Analyze Risk Level

Maintenance, renovation, and construction tasks need to be categorized as either "high-risk" or "low-risk." These categories will help you select workers for each task, give them the right training, and put appropriate work practices in place. Both routine tasks and those specifically designed to reduce lead hazards should be reviewed this way.

Similarly, pending maintenance requests should be reviewed to see if they could disturb lead paint. Current work practices might create lead hazards. Certain work may need to be postponed until your lead-safe program is in place.

→ For this particular job, complete question 2 on the *Work Planning Form* and determine the **Risk Level**.

A Note on Air Monitoring:

Besides the use of "wet" work practices (discussed in Chapter 12 and later in this section), the requirement and use of air monitoring represents the single greatest change in work practices faced by contractors and maintenance/renovation workers in the residential real estate industry.

Cal/OSHA Lead in Construction standard requires initial personal air sampling be done for every type of task where there is potential for lead exposure (regardless of how small). The exceptions to this rule are:

- If personal air samples were taken within the last 12 months under very similar convictions (same type of task, same type of surface, similar lead paint concentration, same work methods, same environmental conditions, and more).
- If there is data to show that a task involves low risk and could not produce exposure above the Action Level.
- Depending on the results of the initial sampling, it must be repeated (see *Repeating Air Sampling* page 150 for schedule).

If personal air sampling is not done, Cal/OSHA requires the presumption that the job will expose workers to lead above the PEL, and all those requirements apply (certified workers, medical surveillance, respirators, and more).

Therefore, employers MUST conduct personal air sampling if they want to use "low-risk" work methods; thereby facilitating the use of lower cost protective measures. The findings will be used to construct a database of lead exposure on the job and establish compliance with the law.

If you do not have air-monitoring data to prove airborne lead is below the PEL, you must presume the exposure is above the PEL. Thus, technically speaking, you would have to use state certified workers to conduct the initial air monitoring of your specific jobs when the lead level is unknown.

Will maintenance workers in the residential real estate industry follow the air monitoring requirements? Hopefully so, but probably not. They are often viewed as being too intrusive for simple little repairs. We hear major resistance from owners and property managers concerning air monitoring being too technical. Here are some thoughts.

- For example, you could conduct lead-paint chip analysis and prove there is no lead in the paint. You would be home free and have none of these requirements to meet.
- Another approach is to ask DHS to conduct the air sampling tests for you. They have the capability and sometimes will do this free of charge, but there is a waiting list. Once you develop your database of typical work practices at specific locations and the release of lead, you can tailor your jobs accordingly.
- Another approach is to put lead-safe work practices in place and ignore the air monitoring requirements. We are not advising this approach, but some Cal/OSHA offices may look upon your effort as sufficient.
- There is a study being funded by EPA to determine "typical" exposure during "typical" maintenance, renovation, construction jobs (see Chapter 4). Some future day, EPA may allow these results to supplant individual air monitoring results, thus obviating the need to develop your own database. In the meantime, we advise you to comply with the law.

→ Complete the following:

☐ Attach sampling results, lab "chain of custody" form, lists of workers samples, calibration information, calculations, etc.

☐ Workers have been notified of sampling results.
Date notified _____. How notified? _____

☐ Typical maintenance tasks have been categorized as either low-risk or high-risk based on sampling results and/or other data

☐ Attach lists of tasks.

Item #3—Personnel Qualifications and Training

All workers, including maintenance workers, must be given basic "awareness" level training on lead if they expect to work in situations with lead hazard. More advnaced training is required when frequent maintenance work involves lead, or specific lead control lead. Keep records of dates when individuals were trained. Some workers may need to obtain DHS-accredited training and DHS Lead Worker certification. Require all contractors doing

work that involves lead exposure to provide proof of DHS-accredited training and DHS certification for lead-related construction. See Chapter 6 for details on employee training.

The only situation where employees do not have to have basic or higher level of lead-hazard training is for work conditions that do not involve lead. Any level of lead or the suspect of lead in the workplace requires employees to be trained on lead hazards.

→ For this particular job, complete question 3 on the *Work Planning Form* and determine the **Personnel Qualifications**.

Item #4A—Communicate with Owners/Residents

Under most circumstances the EPA pamphlet, *Protect Your Family From Lead in Your Home,* must be provided to owners and residents before work begins in either "Low-risk" or "High-risk" jobs.

Notification is required under both:

- EPA (Title X, section 406b went into effect 6/1/1999) (see Chapter 7)
- HUD (Title X, section 1012 and 1013 went into effect 9/15/2000) (see Chapter 9).

Both sets of regulations contain similar language and requirements.

→ Complete the following:

a. Was the housing built in 1978 or later? Yes ☐ No ☐
If "yes," you are exempt from notification. Go on to Work Materials and Equipment/Tools.
If "no," go onto b.

b. Is the housing for the elderly or disabled persons AND children are not expected to reside there? Yes ☐ No ☐

Are the housing "zero-bedroom" dwellings (studio apartments, dormitories, etc.)? Yes ☐ No ☐

Has the housing or components been declared lead-free by a certified inspector or risk assessor? Yes ☐ No ☐

Are these emergency renovations and repairs? Yes ☐ No ☐

Will these minor repairs and maintenance disturb two square feet or less of paint, 20 square feet or less of paint in common areas, or comprise less than 10% of a component? Yes ☐ No ☐

Is the work part of a lead abatement project? Yes ☐ No ☐

If ANY of these are "yes," then you are exempt from notification; go to Work Materials and Equipment/Tools.

If all of these are "no," notification must be given to owners and residents before work begins. Go to the next question.

→ Previous notification. Has the owner, resident, or both received the EPA pamphlet during (a) a previous maintenance, renovation, or construction job, or (b) was given a pamphlet when the deed or lease was signed? Yes ☐ No ☐

If "yes" (and there is documentation to support previous notification), additional notification is not necessary and go to Work Materials and Equipment/Tools. However, it is recommended that notification be given every time. All notifications are to be kept on file for a minimum of 3 years.

If "no," the owners and affected residents need to be served with the EPA pamphlet. Answer the following:

Item #4B—Notification Process

→ Notification may be achieved by (check method used):

☐ EPA pamphlet delivered in person before work begins and obtain Confirmation of Receipt.

☐ If attempted delivery of EPA pamphlet is unsuccessful, or the owner or resident refuses to sign the confirmation notice, you may self-certify by signing the Confirmation of Receipt at the appropriate space.

☐ The EPA pamphlet may be mailed 7 days prior to repairs or renovation and is documented with a certificate of mailing.

→ Attach Confirmation Receipt (found in the **Appendix**) to the work order. These consists of (choose one):

- ☐ *Confirmation of Receipt of Lead Pamphlet (EPA 406(b)) Before Work Begins*
- ☐ *Confirmation of Receipt of Lead Pamphlet (HUD Section 1012/1013) Before Work Begins.*
- ☐ *Renovation Notice of Common Areas*
- ☐ *Notice of Lead-Based Paint Presumption*

→ For this particular job, complete question 4.A on the *Work Planning Form* and determine the **Resident Notification—EPA Pamphlet**.

Residents must be properly notified when work is to commence. This facilitates proper restriction to work areas by residents where there is the potential for lead hazard. In some cases, it may be necessary to relocate residents until the work is completed.

→ For this particular job, complete question 4.B on the *Work Planning Form* and determine the **Resident Notification—Notive of Work to Be Done**.

Work Materials and Equipment/Tools

Very specific materials, equipment and tools are required for lead-safe work. The *Work Planning Form* provides an easy check-off list of what is needed and used on the job.

You need a system for purchasing the necessary equipment and supplies before beginning any job that may disturb lead. These include "caution" tape, plastic sheeting, and warning signs. Sometimes special power tools are needed.

→ For this particular job, complete section Materials and Equipment and Tools found in the *Work Planning Form*.

Employee Protections

Protective clothing and equipment varies according to the expected lead exposure. For "low-risks," only coveralls may be necessary. For "high-risk" tasks, workers may have to wear respirators. (Note: If higher risk tasks are expected, workers need to attend advance lead training and obtain DHS certification). The employer must supply whatever clothing and equipment are required free of charge to workers. You need a system for purchasing, distributing, and maintaining the equipment, and you must train workers in their proper use.

If the work is "high-risk," respirators are required. Keep the following in mind:

- The appropriate respirator is initially selected based on the task being performed and its assumed exposure level. Air monitoring results are then consulted to ensure that adequate protection is being provided.

- A complete respirator program is in place where respirators are used, including: annual face seal fit-testing, regular face seal checking, training, medical determination of fitness for respirator wearing, and provisions for cleaning and storage.

☐ If respirators are to be used, attach a complete written respirator program.

☐ If high-risk tasks are to be performed, attach the Medical Surveillance Program.

→ For this particular job, complete section Personal Protection found in the *Work Planning Form*.

Use Safe Work Practices

The written lead program should describe, in detail, the lead-safe work practices and procedures that must be followed for various types of maintenance and renovation work. Procedures should be spelled out for all aspects of the job— initial personal air sampling, setup, doing the work, cleanup, disposing of waste, and quality assurance. A guide for developing your own lead-safe work practices is the HUD booklet, *Lead Paint Safety: A field guide for painting, home maintenance, and renovation work*. A copy of this booklet is provided during this course. Also, Chapter 12 presents details on safe work practices that were used to develop the *Work Planning Form*.

It is critical to clean up properly after the job is done and never leave work unattended. Also, it is important to provide hand-washing facilities and lunch areas separate from work areas for workers who may have lead exposure.

→ For this particular job, complete sections WORK PRACTICES— Work Smart, Work Wet, Work Clean; Personal Clean Up (Decontamination); and, Carpet Removal found in the *Work Planning Form*.

Waste Management

Property owners always own their lead waste. Companies that perform maintenance/renovations/construction are liable for the waste they create using solvents and other chemicals. Both at the federal and local level there are strict regulations controlling the disposal of lead waste. A Waste Management program needs to address all of these concerns. See Chapter 11 for complete guidelines.

Workers should be instructed in the collection and bagging of lead tainted waste. All waste should be returned to the office unless workers are clearly informed what kinds of waste can be disposed in commercial trash bins. A supervisor should be responsible for safe disposal of lead waste.

→ For this particular job, complete section Waste Disposal found in the *Work Planning Form*.

Assess the Quality

Depending on the residential property on which the work has been done, there are different regulations specifying how lead is assessed for residue and the maximums allowed. With low-risk jobs, Cal/OSHA has no assessment requirements. With high-risk jobs or with jobs falling under HUD regulations, a formal assessment must be made using certified assessors.

Residents cannot use the area until it is completely cleaned. With HUD supported housing and other situations, a Clearance Test must be completed and lead residue found to be under the legal minimums before residents may use the area. If a Clearance Test is performed, residents must be given copies of the results.

→ If Clearance Testing was required for this particular job, complete section Clearance Testing found in the *Work Planning Form* and attach *Notice of Evaluation Activity* (in the **Appendix**).

Quality Assurance

At the completion of the job, workers should verify they completed all steps of the job satisfactorily; including waste disposal.

→ For this particular job, complete section Quality Assurance found in the *Work Planning Form*.

Document and Evaluate the Program.

Develop a system to keep track of all the information your program generates and decisions you make. Some state and federal regulations have specific record keeping requirements. For example, air sampling and blood lead test results must be kept on file according to Cal/OSHA rules.

Keep track of the outside resources your program uses. These may include labs, industrial hygiene services, abatement contractors, equipment suppliers, waste disposal facilities, and government agencies that can answer questions.

Regularly evaluate and improve your program. Programs improve only if you evaluate them periodically and determine what could be done better. For example, when tasks involving lead are done, periodically monitor how much exposure the workers have. High lead levels may point to a need for future improvement in work practices or training. There should be a system to obtain this kind of input regularly and document it.

→ A completed *Work Planning Form* for specific jobs, along with documents for the general programs provide the record keeping required by law.

Outside Contractor Qualifications

If an outside contractor is hired to perform "high-risk" lead work, all the following qualifications need to be answered "yes":

→ Does the contractor have a valid California State Contractors License? Yes ☐ No ☐

→ Are all workers state lead-certified with DHS? Yes ☐ No ☐

→ Does the contractor have insurance with a $1,000,000 minimum for property damage per occurrence? Yes ☐ No ☐

→ Does the contractor have $500,000 minimum limit for bodily injury? Yes ☐ No ☐

→ Does the contractor have written documentation to show implementation of (1) Injury and Illness Prevention Program (IIPP), (2) Hazard Communication Program (Hazcom), (3) Respiratory Protection Program, and (4) Site Safety and Health Plan? Yes ☐ No ☐

Can You Afford a Lead Program?

Yes, it is possible to make a lead-safe program affordable. Following lead-safe work practices requires spending some additional money to purchase necessary equipment and supplies (e.g., plastic sheeting, HEPA vacuums, power tools that can take HEPA attachments, and possibly air sampling equipment). But the cost is minimal compared to the health and safety risks

to employees and residents, and the potential for fines from Cal/OSHA, HUD, EPA, and from litigation.

Sample Compliance Plans

For examples of "High-risk" compliance plans, see ***Appendix*** *Model Written Compliance Plan for "High-risk" Jobs* page 406, and *Example of a Completed Worker Protection Compliance Plan for "High-risk" Jobs* page 411.

APPENDIX

Many of the documents in this Appendix are available on the web from Stewart Education Services. They are downloadable to your computer in a number of formats. That way, you are able to edit and customize the documents for your own needs. This service is available only to persons who attended one or more of the courses offered by Stewart Education Services.

Visit www.StewartEducationServices.com to review and download these documents.

Abbreviations

All of these abbreviations are defined in the Glossary of Terms.

AIHA	American Industrial Hygiene Association
AL	Action Level
APR	Air-purifying respirator
AQMD	Air Quality Management District
ARB	Air Resources Board
ASR	Air-supplied respirator
BAAQMD	Bay Area Air Quality Management District
BLL	Blood lead level
Cal/EPA	California Environmental Protection Agency
Cal/OSHA	California Department of Industrial Relations, Division of Occupational Safety and Health
CDC	Centers for Disease Control and Prevention
CDHS	California Department of Health Services
CLPPB	Childhood Lead Poisoning Prevention Branch
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
Fed/OSHA	U.S. Department of Labor, Occupational Safety and Health Administration
HEPA	High Efficiency Particulate Air
HUD	U.S. Department of Housing and Urban Development
IIPP	Injury and Illness Prevention Program
MRP	Medical Removal Protection
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
OLPPP	Occupational Lead Poisoning Prevention Program
PAPR	Powered air-purifying respirator
Pb	Lead (the chemical symbol)
PEL	Permissible Exposure Limit
Poly	Polyethylene sheet plastic
RCRA	Resource Conservation and Recovery Act
SAR	Supplied-air respirator
SCBA	Self-contained breathing apparatus
STLC	Soluble Threshold Limit Concentration
TTC	Total Threshold Concentration
TTLC	Total Threshold Lead Concentration
TWA	Time-weighted average
XRF analyzer	X-ray fluorescence analyzer
ZPP	Zinc protoporphyrin

Glossary of Terms

Action Level (AL) - A concentration of lead in air of 30 micrograms per cubic meter of air averaged over an 8-hour day. Employees exposed to lead at or above the Action Level must be trained annually in the hazards of lead and must be included in a Medical Surveillance Program.

Air monitoring or sampling - Tests done to measure the amount of lead in the air workers are exposed to while working.

Air-purifying respirator (APR) - A type of respirator that uses filters to reduce the amount of dust, fume or chemical vapor that workers inhale. APRS require the wearer to draw air through the filters when inhaling.

Air Quality Management District (AQMD) - One of several regional agencies that issues and enforces local air pollution regulations in California.

Air Resources Board (AIW) - California's state agency that oversees enforcement of air pollution regulations.

Air-supplied respirator (ASR) - A respirator that supplies clean air from *a* tank or air compressor for the worker to breathe.

Bay Area Air Quality Management District (BAAQMD) - Regional agency that develops and enforces air pollution regulations in the Bay Area.

Biological monitoring - Includes tests for blood lead level (BLL), which measures the amount of lead in the blood, and zinc protoporphyrin (ZPP), which measures damage to the blood-forming system caused by lead.

Blood lead level (BLL) - A measurement of how much lead is in a person's blood. The BLL usually reflects lead exposure received over the prior two to three weeks, and also may be high if the person has a large amount of lead stored in the body.

Breathing-zone - The area around a worker's nose and mouth (within about a 1-foot radius). Air sampling to measure worker exposure to lead is done by placing a small filter within the breathing-zone (e.g., on the lapel), attached to a pump that operates while the person is working.

California Environmental Protection Agency (Cal/EPA) - State agency responsible for issuing and enforcing environmental regulations, e.g., regarding air and water pollution, and hazardous waste.

California Department of Health Services (CDHS) - State government public health department.

California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) - State department that issues and enforces regulations to protect worker health and safety.

Cal/OSHA Consultation Service - Program of Cal/OSHA that provides free, voluntary assistance to employers to evaluate and address health and safety hazards in the workplace.

Centers for Disease Control and Prevention (CDC) - Federal public health agency that oversees the National Institute for Occupational Safety and Health (NIOSH). CDC also provides guidance on the management of childhood lead poisoning cases.

Chelation - A medical treatment for severe lead poisoning. Chelation of a lead-poisoned worker should only be done under the supervision of a doctor experienced in treating adults with lead poisoning.

Childhood Lead Poisoning Prevention Branch (CLPPB) - Program within the California Department of Health Services that conducts activities designed to protect children from lead poisoning. Accredits lead in construction training programs and certifies contractors.

Department of Toxic Substances Control (DTSC) - Program within the California Environmental Protection Agency that is responsible for issuing and enforcing hazardous waste regulations.

Eight-hour time-weighted average (8-hr. TWA) - A way of expressing the amount of chemical exposure to a worker, averaged over an 8-hour period. The Cal/OSHA Permissible Exposure Limit for lead is expressed as an 8-hr. TWA of 50 $\mu g/m^3$.

Engineering controls - Changes that can be made in the work environment (such as ventilation or specially designed tools) that reduce hazards on the lob. Cal /OSHA requires employers to use all possible engineering controls to reduce lead exposures that are higher than 50 $\mu g/m^3$, the Permissible Exposure Limit (PEL).

Face seal check - (also called positive/negative seal check) - Test to check how well a respirator seals to the face. A face seal check should be done every time a respirator is put on.

Fit testing (qualitative or quantitative) - Tests that should be done every six months to evaluate whether a respirator fits properly. A chemical that has a strong smell or taste, or can be measured inside the respirator is introduced in the air around the respirator wearer's head. If there is leakage inside the respirator, the respirator is not fitting well enough to protect the worker.

Fume - Very tiny particles of lead generated when a lead-containing material is heated to high temperatures. Fumes are very easily breathed deep into the lungs.

Hazard Communication - A Cal/OSHA standard that requires employers to provide information and on-going training to workers about the hazards of the substances they work with.

Hazardous waste - Any waste that is defined as dangerous to people or the environment by federal or state laws.

High Efficiency Particulate Air (HEPA) - A type of filter that efficiently captures very small particles and may be used in respirators (now called P-100, R-l00, or N-100 filters), special vacuum cleaners, and ventilation systems for use with toxic dusts or fumes such as lead.

Injury and Illness Prevention Program (IIPP) - A health and safety program Cal/OSHA requires employers to have, which must include ongoing identification, assessment, and control of hazards in the workplace. Includes a requirement for employers to involve workers in keeping a safe workplace.

Lead abatement - A procedure to reduce the hazard of lead-containing paint permanently (at least 20 years) by making lead-painted surfaces intact, inaccessible, or removing them.

Lead in Construction Standard - The Cal/OSHA regulation that spells out protective measures that employers must put in place to protect workers exposed to lead in construction work. (Title 8, CCR 1532.1)

Material Safety Data Sheet (MSDS) - A fact sheet provided by suppliers about the hazards of chemicals contained in products used in the workplace. Employers must make MSDSs available to workers on request.

Medical Removal Protection (MRP) - Part of the Lead in Construction Standard that requires employers to temporarily remove workers with a BLL of 50 mg/di or higher or because they are sick from their job involving lead exposure. Workers removed from lead exposure must be paid their usual wages as long as the job exists or up to 18 months.

Medical Supervisor - A physician who agrees to be in charge of a company's lead Medical Surveillance Program.

Medical Surveillance Program - A program of medical exams and blood testing that an employer must make available to workers under the Lead in Construction Standard.

National Institute for Occupational Safety and Health (NIOSH) - A federal public health agency that conducts research and education on worker health and safety.

P-1OO respirator filters - high efficiency respirator filters that should be used when exposed to lead dust or fume. These used to be known as HEPA filters.

Occupational Lead Poisoning Prevention Program (OLPPP) - A program in the California Department of Health Services (CDHS) that conducts activities designed to protect workers from lead poisoning. Paint chip sampling - Testing done by a laboratory to measure the amount of lead in a paint chip sample that was removed from a surface.

Permissible Exposure Limit (PEL) - The maximum amount of lead that the Lead in Construction Standard allows workers to breathe over a work shift. For an 8-hour work shift, the PEL is 50 micrograms of lead per cubic meter of air.

Polyethylene sheet plastic ("Poly") - Plastic sheeting used to protect surfaces while lead-containing material is being disturbed.

Powered air-purifying respirator (PAPR) - A respirator equipped with a battery-powered blower which draws air through filters and into the facepiece.

Power tool cleaning - The use of power tools (such as grinders, sanders, brushes, and needle guns) to remove dirt or paint from surfaces.

Resource Conservation and Recovery Act (RCRA) - Federal law which regulates hazardous waste disposal for contractors who generate more than 220 pounds of waste per month.

Respiratory Protection Program - A written program Cal/OSHA requires employers to set up to provide for safe and effective use of respirators on the job.

Self-contained breathing apparatus (SCRA) - A respirator which supplies air to the facepiece from a tank carried on the worker's back.

Sodium rhodizonate - A chemical that turns pink or red on contact with lead in certain amounts. It is used in wet chemical field tests like "lead sticks."

Sodium sulfide - A chemical that turns grey, brown, or black on contact with lead in certain amounts. It is used in wet chemical field tests.

Soluble Threshold Limit Concentration (STLC) - A test done to deter-mine whether a waste must be handled as a hazardous waste.

Supplied-air respirator (SAR) - A respirator that supplies clean air from a tank or air compressor for the worker to breathe. Spirometry - A breathing test done to evaluate how well a person's lungs function.

Take-home lead - Lead that is brought home from work on a worker's clothing, shoes, or body. Take-home lead can contaminate cars and homes and endanger a worker's household members, especially young children and pregnant women.

Time-weighted average (TWA) - A way of expressing the varying concentrations of lead in air as a single value averaged over a given period of time.

Title X (10) - A federal law enacted in 1992 that requires several federal agencies and state governments to take actions to deal with lead hazards in housing and construction.

Total Threshold Concentration (TTC) test - A test to measure the amount of lead in a waste sample, and to determine whether it is hazardous.

Total Threshold Lead Concentration (TTLC) Limit - The concentration (1000 ppm, 1000 mg/kg, or 0.1%) of lead at which a waste becomes hazardous.

Type C respirator - A type of supplied-air respirator or air-supplied respirator.

U.S. Department of Housing and Urban Development (HUD) - The federal agency responsible for low-income, federally financed housing.

U.S. Department of Labor, Occupational Safety and Health Administration (Fed/OSHA) - The federal agency that issues and enforces regulations to protect workers from health and safety hazards.

U.S. Environmental Protection Agency (EPA) - The federal agency responsible for protecting the public from the effects of toxic substances in the environment.

Wipe sampling — A test to measure how much lead is present on the surface. It involves wiping a surface of a specific size with a moistened paper or towelette, and sending the sample to a laboratory for analysis.

X-ray fluorescence (XRF) analyzer- An electronic instrument often used by inspectors to test for lead in paint.

Zinc protoporphyrin (ZPP) - A blood test that can indicate the effect of lead exposure over the prior 3 to 4 months. It measures damage to a person's blood-forming system. This test is required by Cal/OSHA to be done along with the blood lead level (BLL) test.

Units of Measure

mg/kg - milligrams per kilogram - Used to specify the concentration of lead in a paint chip sample as a ratio of weight of lead per weight of dry paint film sample. Equivalent to parts per million (ppm). 10,000 mg/kg equals 1%.

mg/l - milligrams per liter - The weight (lead) of material in one liter of water. Used in the STLC test to specify the maximum amount of lead allowed in liter of water.

mg/cm^2 - milligrams per square centimeter - Used to specify the concentration of lead in dry paint mm expressed as the weight of lead per area of painted surface. A square centimeter is about the same size as your thumbnail. These units are used for XRF measurements.

ppm - parts per million - Used to specify the concentration of lead in a paint chip sample as a ratio of weight of lead per weight of paint sample. Equivalent to mg/kg. 10,000 ppm equals 1%.

***µ*g/dl** - micrograms per deciliter - Used to specify the amount of lead in a person's blood sample, expressed in weight of lead per 100 milliliters of whole blood. A deciliter is a little less than half a cup.

***µ*g/m^3** - micrograms per cubic meter of air - Used to specify the concentration of lead dust or fume in air. These units are used to express results of personal air monitoring.

***µ*g/ft^2** - micrograms per square foot - Used to specify the amount of lead dust on a surface. These units are used for wipe sampling, for example for post-job clearance testing.

U.S. DEPARTMENT OF JUSTICE
U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

FOR IMMEDIATE RELEASE Wednesday, July 11, 2001

HUD: (202) 708-0685
WWW.USDOJ.GOV DOJ: (202) 514-2007
WWW.HUD.GOV HUD: (202) 708-0685

LANDLORD PLEADS GUILTY TO LYING ABOUT LEAD PAINT HAZARDS

Case is First Federal Prosecution for Violation of Lead Hazard Warnings

WASHINGTON, D.C. – A Washington-area landlord pleaded guilty today to obstructing justice and making false statements to federal officials, in order to conceal his failure to notify tenants of the presence and hazards associated with lead-based paint. The case is the first-ever criminal prosecution in the United States related to lead hazard warnings that are required by the federal Lead Hazard Reduction Act of 1992.

David D. Nuyen, 65, of Silver Spring, Md., admitted to the charges in a plea agreement filed today in U.S. District Court in Greenbelt, Md. Nuyen will serve two years in prison under the terms of the agreement, if the court approves it. As part of the agreement, Nuyen also will provide all tenants with new notices about actual and potential lead hazards, and he will retain an independent contractor to assess lead paint hazards and develop a lead abatement plan for his properties. He is also subject to a maximum $250,000 criminal fine for each of the six felony counts to which he is pleading. Sentencing is set for November 19, 2001.

Nuyen has owned and managed 15 low-income rental properties in the District of Columbia and Maryland. According to a factual statement signed by Nuyen, he had notice of actual lead-paint hazards in one of his apartment buildings from District of Columbia lead inspectors, who informed him that they found lead in the building. However, Nuyen failed to provide his tenants with notice about actual and potential lead hazards before they signed leases.

"The dangers of lead poisoning have been known for years, but too many children continue to be exposed to lead hazards," said John Cruden, the Acting Assistant Attorney General in charge of the Justice Department's Environment Division. "We will vigorously enforce the federal lead disclosure requirements to protect the public and our children from these unnecessary health risks."

"Landlords must know they have a responsibility to warn their tenants of known lead hazards in their apartments," said Richard A. Hauser, HUD's General Counsel. "HUD will continue to protect young children and their families from landlords who don't take this responsibility seriously."

Nuyen had attended classes on the Lead Hazard Reduction Act in 1997 and 1998, a requirement for being a licensed real estate broker in Maryland and Virginia. The Act, which became effective in 1996, requires landlords to give tenants an EPA pamphlet about how to minimize the dangers to children, and it directs landlords to document their compliance with the law by keeping tenants' signatures on file, using a standard disclosure form.

In September 1998, the Department of Housing and Urban Development contacted Nuyen as part of a federal initiative to enforce the Lead Hazard Reduction Act. Nuyen had no lead paint disclosure forms at that time, but he arranged a subsequent meeting with HUD officials, in November 1998, in which he presented the agency with false and backdated forms.

Nuyen admitted that he "sought to obstruct" the HUD investigation by backdating his signature, backdating tenant signatures, and directing tenants to backdate forms by entering the date they moved into their apartments, rather than the date they were actually warned about health risks, which was years after their move-in dates. In some cases, the tenant signatures were signed by Nuyen's resident property managers.

In addition to the obstruction of justice and false statements charges, Nuyen pleaded guilty to charges that he failed to provide the required lead hazard pamphlet and lead paint disclosure form. He also pleading guilty to a charge that he made false statements in connection with an investigation of alleged mortgage fraud.

Lead poisoning is a significant health risk for young children. Although ingesting lead is hazardous to all humans, children under six years of age are at the greatest risk of lead poisoning because their bodies are still developing and because ordinary hand-to-mouth activity brings them into frequent contact with lead in paint chips, dust and soil. Lead adversely affects virtually every system of the body, and it can impair a child's central nervous system, kidneys, and bone marrow and, at high levels, can cause coma, convulsions, and death. Lead poisoning is especially acute among low-income and minority children living in older housing.

HUD's Office of Inspector General, the EPA Criminal Investigation Division and the Federal Bureau of Investigation conducted the investigation. The case was prosecuted by the U.S. Attorney's Office for the District of Maryland and the Environmental Crimes Section, Environment and Natural Resources Division of the Justice Department.

State of California—Health and Human Services Agency | Department of Health Services

ABATEMENT OF LEAD HAZARDS NOTIFICATION

Work is being conducted to abate lead-based paint or lead hazards in or on this structure. For more information, please contact the individuals and/or agencies listed below.

Section 1—Structure Where Abatement of Lead-Based Paint or Lead Hazards is Scheduled

Address (number; street; apartment number, if applicable)	City	County	ZIP code

Type of structure (check one box only)

☐ Single family dwelling ☐ Multi-family building ☐ Child-occupied facility ☐ Other (specify)_____

Section 2—Summary of Specific Work Areas Where Lead-Based Paint or Lead Hazards Will Be Abated

Section 3

Projected starting date	Projected ending date

Section 4—Restrictions on Entering Work Area

List specific times and/or dates residents are not allowed to enter work areas, if applicable

If you would like more information, please contact the following:

Section 5—Owner

Name		Telephone number ( )	
Address (number, street)	City	State	ZIP code

Section 6—Individual Conducting Abatement

Name	Telephone number ( )	DHS certification number	
Address (number, street)	City	State	ZIP code

Section 7—Local Agency

Health Department Lead Program telephone number
( )

Notification letter to be posted at all entrances to structure and mailed to the Department at:

Department of Health Services
Childhood Lead Poisoning Prevention Branch
Reports
1515 Clay Street, No. 1801
Oakland, CA 94612
FAX (510) 622-5002

DHS 8551 (2/99)

State of California—Health and Human Services Agency

Department of Health Services

LEAD HAZARD EVALUATION REPORT

Section 1—Date of Lead Hazard Evaluation _____

Section 2—Type of Lead Hazard Evaluation (Check one box only)

☐ Lead inspection ☐ Risk assessment ☐ Clearance inspection ☐ Other (specify) _____

Section 3—Structure Where Lead Hazard Evaluation Was Conducted

Address [number, street, apartment (if applicable)]	City	County	ZIP code

Construction date (year) of structure	Type of structure (check one box only)
	☐ Single family dwelling ☐ Multi-unit building ☐ Child-occupied facility ☐ Other (specify) _____

Section 4—Owner of Structure (If business/agency, list contact person)

Name		Telephone number ( )	
Address [number, street, apartment (if applicable)]	**City**	**State**	**ZIP code**

Section 5—Results of Lead Hazard Evaluation (Check one box only)

☐ **No lead-based paint detected.**
A lead inspection was conducted following the procedures outlined in Title 17, California Code of Regulations, Division 1, Chapter 8. No lead-based paint was detected during this lead inspection. This structure is found to be lead-based paint free.

☐ **No lead hazards detected.**
Lead hazard evaluation was conducted following the procedures outlined in Title 17, California Code of Regulations, Division 1, Chapter 8. No lead hazards were detected.

☐ **Lead-based paint and/or lead hazards detected.**
Lead hazard evaluation was conducted following the procedures outlined in Title 17, California Code of Regulations, Division 1, Chapter 8. Lead-based paint and/or lead hazards were detected.

Section 6—Individual Conducting Lead Hazard Evaluation

Name		Telephone number ( )	
Address [number, street, apartment (if applicable)]	**City**	**State**	**ZIP code**

Brand name and serial number of any portable x-ray fluorescence (XRF) instrument used (if applicable)

DHS certification number	Signature	Date
	➤	

Section 7—Attachments

A. A foundation diagram or sketch of the structure indicating the specific locations of each lead hazard or presence of lead-based paint;

B. Each testing method, device, and sampling procedure used;

C. All data collected, including quality control data, laboratory results, including laboratory name, address, and phone number.

First copy and attachments retained by inspector

Second copy and attachments retained by owner

Third copy only (no attachments) mailed to:
Department of Health Services
Childhood Lead Poisoning Prevention Branch
Reports
1515 Clay Street, No. 1801
Oakland, CA 94612
FAX (510) 622-5002

DHS 8552 (2/99)

DOSH Letter 2/16/2002—Lead Work Pre-Job Notification

STATE OF CALIFORNIA — Gray Davis, *Governor*

DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
455 Golden Gate Avenue, Tenth Floor
San Francisco, CA 94102

ADDRESS REPLY TO:
P.O. BOX 420603
San Francisco, CA 94142

Attention: Organizations involved with lead-related construction activities:

Lead Work Pre-Job Notification: The California Division of Occupational Safety and Health (Division) recently amended the Lead Standard in the Construction Safety Orders (Title 8 of the California Code of Regulations) Section 1532.1, to include a requirement for employers who perform lead-related construction activities to make a Lead Work Pre-Job Notification to the Division.

As of January 25, 2002, employers who conduct activities that are listed in subsection (d)(2) of the standard are required to provide written notification to the Division at least 24 hours before the start of the work. The activities include manual demolition of structures, manual scraping, manual sanding, heat gun application, and power tool cleaning where lead containing coatings or paint are present, spray painting with lead paint; using lead mortar or lead burning; rivet busting; abrasive blasting, cleanup after the use of dry expendable abrasives, and abrasive blasting enclosure movement and removal; welding, cutting and torch burning.

The pre-job notification to the Division must provide: the name and contact information on the employer who will conduct the lead activities, the address and exact location of the lead work, the starting date and ending date that are planned for the work, the name of the supervisor for the job, and the number of workers planned to do the work. Also required are the type of structure that will be worked on, the amount of lead containing material that will be disturbed, a description of the type of lead work that will be done and the work practices that will be used, and if known, the lead content of the material.

Some lead-related construction work that involves very small amounts of lead is exempt from the notification requirement. Contractors do not have to make this notification if: 1) the lead content of the materials being disturbed is less than 0.5%, 5,000 parts per million (weight by weight), or 1.0 mg/cm^2 or if: 2) the amount of lead-containing materials to be disturbed is less than 100 square or 100 linear feet; or if 3) the only subsection (d)(2) task to be performed consists of torch cutting or welding for no longer than 1 hour in any shift.

A copy of section 1532.1, Lead and guidance on the new notification requirements are available from Cal/OSHA's web page at: www.dir.ca.gov/DOSH/dosh1.html or by calling the Division's free consultation service assistance number at 1-800-963-9424. In addition, employers can satisfy the notification requirement by sending written notification to the nearest Division District Office or by completing the Lead Work Pre-Job Notification Form (MS Excel format) PDF Format (55.6KB) on line in the Permits and Notification section of the Cal/OSHA web page, and emailing it to DOSHLeadNotice@dir.ca.gov

(Note: this requirement is separate from the CA Department of Health Services Form 8551, Abatement of Lead Hazard Notification and does not pre-empt their lead abatement review procedure.)

DOSH Lead Work Pre-Job Notification Form 1532.1

STATE OF CALIFORNIA
Division of Occupational Safety and Health

LEAD-WORK PRE-JOB NOTIFICATION

☐ Annual Notification for Steel Structures

(*Note: items marked are required)

*Name of employer doing 'Lead Work'	*Address	*Zipcode	*Phone
Calif. Cont. Lic. No. (if applicable)			Pager/cellular phone no.

Supervisor:	*Number of lead-job workers: (Check one below)	
* Supervisor name: _____	☐ 1 - 5	☐ 31 - 40
California Department of Health Services Lead Cert. No. (if applicable) _____	☐ 6 - 10	☐ 41 - 50
	☐ 11 - 20	☐ > 50
	☐ 21 - 30	

*Job start date/time	*Job completion date/time	Shift (Check all that apply)	*Approximate duration of 'Lead Work' in days
		☐ Day ☐ Swing ☐ Graveyard ☐ Other	

*Street address or location of job	City	Nearest cross street
	County	Zipcode

*Precise location of work (building no., room no., etc.)

Entity contracting the lead-work (check one)	Address	Zipcode	Phone
☐ Premises Owner ☐ Lessee Name:			Pager/cellular phone no.

Type of structure and use: (Check all that apply)

☐ Office Building ☐ Residence ☐ Steel Structure/Type _____
☐ Public Access/Commercial ☐ School ☐ Other _____

Scope of work and work practices:

*Describe lead-related work to be done (check all that apply)

☐ Surface Preparation ☐ Wall Repair ☐ Other _____
☐ Water/Moisture Damage Repair ☐ Paint Removal
☐ Window/Door Repair/Replacement Demolition

*Describe paint removal methods (Check all that apply):

☐ Manual Scraping/Sanding ☐ Demolition ☐ Hydroblasting ☐ Other work practices disturbing lead:
☐ Power Sanding/Grinding ☐ Heat Guns ☐ Torch Cutting _____
☐ Chemical Stripping ☐ Abrasive Blasting ☐ Welding

*Amount of area to be disturbed: (Check one per column)

☐ < 10 square feet	☐ < 10 linear feet
☐ 10 - 100 square feet	☐ 10 - 100 linear feet
☐ 101 - 1000 square feet	☐ 100 - 1000 linear feet
☐ > 1000 square feet	☐ > 1000 linear feet

Torch cutting/welding
Duration of work: _____

Concentration of lead in disturbed materials:
_____ parts per million (ppm) _____ % percent by weight
_____ mg/cm^2 Assumed to be lead-containing: ☐ YES

Name of Notifier:	Title:	Date:

This information is provided in accordance with Title 8, California Code of Regulations, Construction Safety Order Section1532.1 (p). 1/25/02

Disclosure of Information on Lead-Based Paint and/or Lead-Based Paint Hazards

Lead Warning Statement

Housing built before 1978 may contain lead-based paint. Lead from paint, paint chips, and dust can pose health hazards if not managed properly. Lead exposure is especially harmful to young children and pregnant women. Before renting pre-1978 housing, lessors must disclose the presence of known lead-based paint and/or lead-based paint hazards in the dwelling. Lessees must also receive a federally approved pamphlet on lead poisoning prevention.

Lessor's Disclosure

(a) Presence of lead-based paint and/or lead-based paint hazards (check (i) or (ii) below):

(i) _____ Known lead-based paint and/or lead-based paint hazards are present in the housing (explain).

_____

_____

(ii) _____ Lessor has no knowledge of lead-based paint and/or lead-based paint hazards in the housing.

(b) Records and reports available to the lessor (check (i) or (ii) below):

(i) _____ Lessor has provided the lessee with all available records and reports pertaining to lead-based paint and/or lead-based paint hazards in the housing (list documents below).

_____

_____

(ii) _____ Lessor has no reports or records pertaining to lead-based paint and/or lead-based paint hazards in the housing.

Lessee's Acknowledgment (initial)

(c) _____ Lessee has received copies of all information listed above.

(d) _____ Lessee has received the pamphlet *Protect Your Family from Lead in Your Home.*

Agent's Acknowledgment (initial)

(e) _____ Agent has informed the lessor of the lessor's obligations under 42 U.S.C. 4852(d) and is aware of his/her responsibility to ensure compliance.

Certification of Accuracy

The following parties have reviewed the information above and certify, to the best of their knowledge, that the information they have provided is true and accurate.

Lessor	Date	Lessor	Date
Lessee	Date	Lessee	Date
Agent	Date	Agent	Date

Disclosure of Information on Lead-Based Paint and/or Lead-Based Paint Hazards

Lead Warning Statement

Every purchaser of any interest in residential real property on which a residential dwelling was built prior to 1978 is notified that such property may present exposure to lead from lead-based paint that may place young children at risk of developing lead poisoning. Lead poisoning in young children may produce permanent neurological damage, including learning disabilities, reduced intelligence quotient, behavioral problems, and impaired memory. Lead poisoning also poses a particular risk to pregnant women. The seller of any interest in residential real property is required to provide the buyer with any information on lead-based paint hazards from risk assessments or inspections in the seller's possession and notify the buyer of any known lead-based paint hazards. A risk assessment or inspection for possible lead-based paint hazards is recommended prior to purchase.

Seller's Disclosure

(a) Presence of lead-based paint and/or lead-based paint hazards (check (i) or (ii) below):

(i) _____ Known lead-based paint and/or lead-based paint hazards are present in the housing (explain).

_____

(ii) _____ Seller has no knowledge of lead-based paint and/or lead-based paint hazards in the housing.

(b) Records and reports available to the seller (check (i) or (ii) below):

(i) _____ Seller has provided the purchaser with all available records and reports pertaining to lead-based paint and/or lead-based paint hazards in the housing (list documents below).

_____

(ii) _____ Seller has no reports or records pertaining to lead-based paint and/or lead-based paint hazards in the housing.

Purchaser's Acknowledgment (initial)

(c) _____ Purchaser has received copies of all information listed above.

(d) _____ Purchaser has received the pamphlet *Protect Your Family from Lead in Your Home.*

(e) Purchaser has (check (i) or (ii) below):

(i) _____ received a 10-day opportunity (or mutually agreed upon period) to conduct a risk assessment or inspection for the presence of lead-based paint and/or lead-based paint hazards; or

(ii) _____ waived the opportunity to conduct a risk assessment or inspection for the presence of lead-based paint and/or lead-based paint hazards.

Agent's Acknowledgment (initial)

(f) _____ Agent has informed the seller of the seller's obligations under 42 U.S.C. 4852(d) and is aware of his/her responsibility to ensure compliance.

Certification of Accuracy

The following parties have reviewed the information above and certify, to the best of their knowledge, that the information they have provided is true and accurate.

Seller	Date	Seller	Date
Purchaser	Date	Purchaser	Date
Agent	Date	Agent	Date

Declaración de Información sobre Pintura a Base de Plomo y/o Peligros de la Pintura a Base de Plomo

Declaración sobre los Peligros del Plomo

Las viviendas construidas antes del año 1978 pueden contener pintura a base de plomo. El plomo de pintura, pedazos de pintura y polvo puede representar peligros para la salud si no se maneja apropiadamente. La exposición al plomo es especialmente dañino para los niños jóvenes y las mujeres embarazadas. Antes de alquilar (rentar) una vivienda construida antes del año 1978, los arrendadores tienen la obligación de informar sobre la presencia de pintura a base de plomo o peligros de pintura a base de plomo conocidos en la vivienda. Los arrendatarios (inquilinos) también deben recibir un folleto aprobado por el Gobierno Federal sobre la prevención del envenenamiento de plomo.

Declaración del Arrendador

(a) Presencia de pintura a base de plomo y/o peligros de pintura a base de plomo (marque (i) ó (ii) abajo):

(i) _____ Confirmado que hay pintura a base de plomo y/o peligro de pintura a base de plomo en la vivienda (explique).

_____

(ii) _____ El arrendador no tiene ningún conocimiento de que haya pintura a base de plomo y/o peligro de pintura a base de plomo en la vivienda.

(b) Archivos e informes disponibles para el vendedor (marque (i) ó (ii) abajo):

(i) _____ El arrendador le ha proporcionado al comprador todos los archivos e informes disponibles relacionados con pintura a base de plomo y/o peligro de pintura a base de plomo en la vivienda (anote los documentos abajo).

_____

(ii) _____ El arrendador no tiene archivos ni informes relacionados con pintura a base de plomo y/o peligro de pintura a base de plomo en la vivienda.

Acuse de Recibo del Arrendatario o Inquilino (inicial)

(c) _____ El arrendatario ha recibido copias de toda la información indicada arriba.

(d) _____ El arrendatario ha recibido el folleto titulado *Proteja a Su Familia del Plomo en Su Casa.*

Acuse de Recibo del Agente (inicial)

(e) _____ El agente le ha informado al arrendador de las obligaciones del arrendador de acuerdo con 42 U.S.C. 4852(d) y está consciente de su responsabilidad de asegurar su cumplimiento.

Certificación de Exactitud

Las partes siguientes han revisado la información que aparece arriba y certifican que, según su entender, toda la información que han proporcionado es verdadera y exacta.

Arrendador	Fecha	Arrendador	Fecha
Arrendatario	Fecha	Arrendatario	Fecha
Agente	Fecha	Agente	Fecha

Declaración de Información sobre Pintura a Base de Plomo y/o Peligros de la Pintura a Base de Plomo

Declaración sobre los Peligros del Plomo

Se notifica a todo comprador de cualquier interés en propiedad real residencial en la cual fue construida una vivienda residencial antes del año 1978, que dicha propiedad puede presentar una exposición a plomo de la pintura a base de plomo que podría poner a niños jóvenes en situación de riesgo de desarrollar envenenamiento de plomo. El envenenamiento de plomo en niños jóvenes puede producir daños neurológicos permanentes, incluyendo incapacidad para el aprendizaje, cociente de inteligencia reducido, problemas de comportamiento y memoria dañada. El envenenamiento de plomo también representa un peligro especial para las mujeres embarazadas. El vendedor de cualquier interés en una propiedad privada real residencial tiene la obligación de proporcionarle al comprador toda la información que posea sobre los peligros de la pintura a base de plomo que se hayan determinado en evaluaciones o inspecciones de riesgo y de notificarle al comprador sobre cualquier peligro que conozca de la pintura a base de plomo. Se recomienda realizar una evaluación o inspección de posibles peligros de la pintura a base de plomo antes de la compra.

Declaración del Vendedor

(a) Presencia de pintura a base de plomo y/o peligros de pintura a base de plomo (marque (i) ó (ii) abajo):

(i) _____ Confirmado que hay pintura a base de plomo y/o peligro de pintura a base de plomo en la vivienda (explique).

_____

(ii) _____ El vendedor no tiene ningún conocimiento de que haya pintura a base de plomo y/o peligro de pintura a base de plomo en la vivienda.

(b) Archivos e informes disponibles para el vendedor (marque (i) ó (ii) abajo):

(i) _____ El vendedor le ha proporcionado al comprador todos los archivos e informes disponibles relacionados con pintura a base de plomo y/o peligro de pintura a base de plomo en la vivienda (anote los documentos abajo).

_____

(ii) _____ El vendedor no tiene archivos ni informes relacionados con pintura a base de plomo y/o peligro de pintura a base de plomo en la vivienda.

Acuse de Recibo del Comprador (inicial)

(c) _____ El comprador ha recibido copias de toda la información indicada arriba.

(d) _____ El comprador ha recibido el folleto titulado *Proteja a Su Familia del Plomo en Su Casa.*

(e) El comprador ha (marque (i) ó (ii) abajo):

(i) _____ recibido una oportunidad por 10 días (o un período de tiempo de mutuo acuerdo) para hacer una evaluación o inspección de riesgo de presencia de pintura a base de plomo o de peligros de pintura a base de plomo; o

(ii) _____ renunciado a la oportunidad de hacer una evaluación o inspección de riesgo de presencia de pintura a base de plomo o de peligros de pintura a base de plomo.

Acuse de Recibo del Agente (inicial)

(f) _____ El agente le ha informado al vendedor de las obligaciones del vendedor de acuerdo con 42 U.S.C. 4852(d) y está consciente de su responsabilidad de asegurar su cumplimiento.

Certificación de Exactitud

Las partes siguientes han revisado la información que aparece arriba y certifican que, según su entender, toda la información que han proporcionado es verdadera y exacta.

Vendedor	Fecha	Vendedor	Fecha
Comprador	Fecha	Comprador	Fecha
Agente	Fecha	Agente	Fecha

Clearance Not Required

Use the following when no assessment of lead hazards is done before work begins and when the work does not require any clearance or assessment of lead hazards after the work is completed.

> "Contractor has no responsibility to assess the extent of lead contamination before, during, or after the work it performs, except as (1) required under OSHA for the protection only of contractor's employees, or (2) otherwise specifically stated in the scope of work provision of this contract. Owner and contractor expressly agree that contractor shall have no liability whatsoever for any claim, cost or expense related to the presence of lead on the property."

Clearance Testing Required

Use the following when your work requires clearance testing only of the areas where you worked.

> "Contractor is responsible for cleaning lead only in the areas in which contractor worked, as described in the scope of work provision of this contract. Contractor shall have conclusively completed its cleanup of lead when it has obtained clearance analysis as provided in the scope of work provision of this contract. Owner and painting contractor expressly agree once contractor has obtained such clearance analysis, contractor shall have no liability whatsoever for any claim, cost, or expense related to the presence of lead on the property."

_____. MEDIATION AND ARBITRATION

_____.1 Controversies and Claims Subject to Mediation and Arbitration. If any controversy or claim arises from or relates to this Contract, or the breach thereof, and if said controversy or claim cannot be settled through direct discussions between the parties to this Agreement, such parties agree to first endeavor to settle the dispute in an amicable manner by mediation with a mutually acceptable mediator before either party may have recourse to arbitration (or litigation in the circumstances where litigation of claims or disputes is permitted under the terms of this Contract). If the parties are unable to agree upon a mutually acceptable mediator, then either party may request that the San Francisco office of the American Arbitration Association appoint a neutral mediator and the mediation shall be conducted under the Commercial Mediation Rules of the American Arbitration Association.

If the mediation leaves any controversy or claim unresolved, then such continuing controversy or claim arising out of or related to the Contract, or the breach thereof, shall (except to the extent otherwise provided below) be settled by binding arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association, coordinated through the San Francisco office of the American Arbitration Association. The parties may otherwise agree at the time of the controversy or claim to (1) conduct such arbitration under different rules, and (2) before any mutually agreeable arbitrator(s), and (3) that such arbitration need not to be coordinated or administered through the American Arbitration Association.

[THE FOLLOWING IS SUGGESTED BUT NOT ESSENTIAL.]

_____.2 Claims and Timely Assertion of Claims. A party who files a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded. When a party fails to include a Claim through oversight, inadvertence or excusable neglect, the arbitrator or arbitrators may permit amendments.

_____.3 Judgment on Final Award. The award rendered by the arbitrator(s) shall be final and binding, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof. [NOTE: INSERT THIS WHERE APPLICABLE. The award by the arbitrator(s) may constitute a final adjudication of fault as described in the provision of this Agreement regarding indemnification.]

_____.4 Indispensable Parties to Claim. Notwithstanding any provision in the Contract to the contrary, if a controversy or claim involves any indispensable party who is not subject to mandatory arbitration and who does not voluntarily agree to arbitrate, then either party may elect to litigate such controversy or claim by filing a lawsuit naming such third party as an additional party thereto, in which event the arbitration provisions of the Contract Documents shall not apply to such controversy or claim, provided the party so asserting that such third party is an indispensable party to the controversy or claim asserted in such litigation can prove to the satisfaction of the court that such party is an indispensable party.

MSD—Lead Painted Building Debris
(RG Document #33. Revision #2, Revision Date June 13, 1994)

The Department does not generally expect intact painted building materials to exhibit a characteristic of a hazardous waste pursuant to the criteria contained in Chapter 11, Division 4.5, Title 22, California Code of Regulations (22 CCR) and would not require the disposal of the intact painted material as a hazardous waste. The waste classification is dependent, in part, upon the physical characteristics of the waste. For example, when the paint is still bonded to the building materials, a generator should consider the ratio of the mass of all materials in a waste to the lead content of the paint when determining the hazardous waste classification of intact demolition debris. However, if during the demolition or dismantling of the buildings, the paint is separated from the building material (e.g., chemically or physically removed), then the paint waste should be evaluated independently from the building material to determine its proper management.

See Also: Soils Contaminated With Hydrocarbons

Pursuant to Section 66262.11, Title 22, California code of Regulations (22 CCR), it is the generator's responsibility to determine if his waste is hazardous or nonhazardous by testing representative samples of the waste using the methods set forth in Chapter 11, Division 4.5,22 CCR and/or applying knowledge of the hazardous characteristics of the waste in light of the materials or processes used to generate the waste. If the waste exhibits any of these characteristics, it is classified as a hazardous waste and must be managed as such. The classification of wastes is not to be confused with the establishment of cleanup levels. Waste classification determines only whether a waste must be managed as a hazardous waste. To obtain further documents relating to the sampling and classification of wastes, call the waste evaluation helpline at (916) 322-7676. Copies of Division 4.5, Title 22, California Code of Regulations are available at most public libraries which contain a government publications section or are available for purchase by calling Barclays Law Publishers at (415) 244-6611.

California Environmental Protection Agency Office of Scientific Affairs
Department of Toxic Substances Control Waste Evaluation Unit
P.O. Box 806, Sacramento, California 95812-0806

MSD—Asbestos
(RG Document #5, Revision #1 Revision Date August 19, 1993)

Any waste which contains greater than one- percent asbestos in a friable, finely divided, or powdered state is properly classified as a hazardous waste. The term "friable" refers to the ability to reduce a material or waste to a dust or powder under hand pressure when dry. Nonfriable asbestos-containing wastes, such as floor tile or asphalt felt roofing, are considered to be nonhazardous waste (regardless of the concentration of asbestos present in the waste). However, if the asbestos-containing material is damaged in the process of removal so that it becomes friable or is in a finely divided or powdered state, the waste may be regulated as a hazardous waste if the concentration of friable asbestos is greater than one percent.

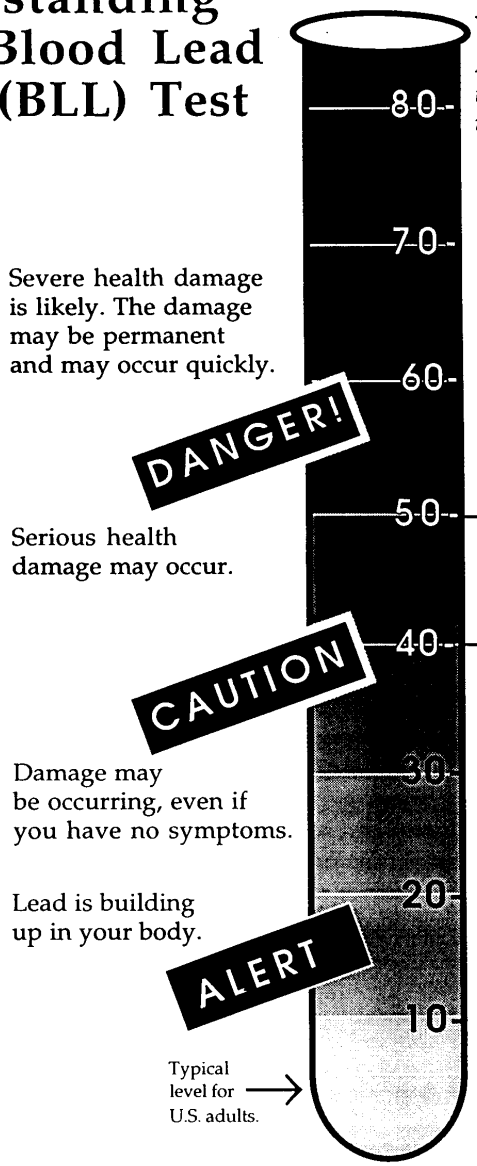
Wetting and double-bagging of asbestos-containing hazardous waste does not make the waste nonhazardous because it does not change the friability of the waste. These activities insure that inhalation hazards presented by asbestos-containing wastes are mitigated during handling and transportation. These handling methods do not change the classification of the waste.

The Department allows asbestos-containing waste which is wetted and packaged in an air-tight container to be safely disposed in a properly operated nonhazardous waste landfill that has been issued waste discharge requirements from the Regional Water Quality Control Board to receive such wastes. Pursuant to section 25143.7 of the California Health and Safety Code, disposal to a nonhazardous waste landfill is allowed if the asbestos-containing waste is managed in accordance with federal requirements found in the Toxic Substances Control Act and all applicable regulations adopted pursuant to this law. Additional federal requirements for the management of asbestos-containing wastes may be found in the federal Clean Air Act and regulations adopted pursuant to this law.

See Also: No other references.

Pursuant to Section 66262.11, Title 22, California Code of Regulations (22 CCR), it is the generator's responsibility to determine if his waste is hazardous or nonhazardous by testing representative samples of the waste using the methods set forth in Chapter 11, Division 4.5, 22 CCR and/or applying knowledge of the hazardous characteristics of the waste in light of the materials or processes used to generate the waste. If the waste exhibits any of these characteristics, it is classified as a hazardous waste and must be managed as such. The classification of wastes is not to be confused with the establishment of cleanup levels. Waste classification determines only whether a waste must be managed as a hazardous waste. To obtain further documents relating to the sampling and classification of wastes, call the waste evaluation helpline at (916) 322-7676. Copies of Division 4.5, Title 22, California Code of Regulations are available at most public libraries which contain a government publications section or are available for purchase by calling Barclays Law Publishers at (415) 244-6611.

Understanding Your Blood Lead Level (BLL) Test



Severe health damage is likely. The damage may be permanent and may occur quickly.

Serious health damage may occur.

Damage may be occurring, even if you have no symptoms.

Lead is building up in your body.

What action is required?

For lead-related construction jobs, the steps below are required by Cal/OSHA regulations.

50 or GREATER

- You *must* be removed from your high lead job until your blood lead level drops to 40 µg/dl or less on two tests in a row. If a safe job is not available, you must be paid full wages and benefits while you are off work.
- Your employer *must* arrange for you to be checked by a doctor and to have blood tests every month, at no cost to you.

40 to 49

- Your employer *must* arrange for you to be checked by a doctor once each year and to get blood tests every two months, until your level is 40 µg/dl or less on two tests.

39 or LESS

- Your employer may be required to arrange for you to have blood tests every two months for the first six months of employment and every six months after that.

- Your employer *must* arrange for you to see a doctor if you:
  - -have symptoms which may be related to lead exposure;
  - -want advice concerning the effects of lead on your ability to have a healthy child; or
  - -have difficulty breathing with a respirator.

Understanding Your ZPP Test - How it is different from Blood Lead Level results

What does a ZPP (Zinc Protoporphyrin) test measure?

ZPP measures a substance in the blood that increases when lead interferes with the red blood cells' ability to make hemoglobin. (Hemoglobin is the oxygen carrying part of the blood.) The test is used, together with the Blood Lead Level, to monitor the effect of lead exposure in the body.

What does the ZPP test result tell you about your exposure to lead?

The ZPP level rises and falls more slowly than the Blood Lead Level and is an indicator of the amount of lead exposure over the last 3 to 4 months.

What is an expected ZPP level?

A ZPP level of 50 ug/dl or less is expected for adults with no lead exposure. A ZPP higher than 50 ug/dl usually means you have too much lead in your body, unless you have another condition like anemia.

California Department of Health Services — Construction Version, April 1995 — Occupational Lead Poisoning Prevention Program

"DEAR EMPLOYEES: Blood-Lead Test Results"

Employers--Use this letter to let each worker know the results of his or her blood-lead test.

Make a copy for each worker on your company's stationery. Keep a copy of each completed form for your records.

TO: _____ Date: ____/____/____

POSITION: _____

As you know, your work in this company may expose you to lead dust or fumes. To help find out whether or not your body has absorbed too much lead, a sample of your blood was collected and analyzed.

Test Date: ____/____/____

Blood Lead Level: _____ ug/dl (micrograms per deciliter)

ZPP Level: _____ ug/dl

Your next blood lead test will be: ____/____/____

To help you understand your test results, please read Understanding Your Blood Lead Level and ZPP Tests on the other side. However, a blood test alone cannot show whether or not lead is affecting your body. If you think you have symptoms of lead poisoning or have any additional questions, please talk to the doctor in charge of this company's medical program:

Dr. _____ Phone: (_____) _____

What Health Damage Can Lead Cause?

Lead slowly builds up in your body. The more lead, the more likely it is that harm will occur. Large amounts of lead can severely damage your brain, nerves, kidneys, or blood. You may notice tiredness, trouble concentrating, headaches, irritability, stomach pains, poor appetite, constipation, diarrhea, muscle or joint pains, or weakness. Damage may be occurring even if you have no symptoms. Each person responds differently. Lead can also harm your ability to have a healthy child, whether you are a man or woman.

California Department of Health Services **Construction Version April 1995** Occupational Lead Poisoning Prevention Program

Como Interpretar Los Resultados del Análisis de Plomo en la Sangre

Es probable que ocurran daños severos a la salud. El daño puede ser permanente y puede ocurrir rápido.

Puede ocurrir daño a la salud muy severo.

Puede que esté sufriendo daño, aunque no tenga síntomas.

El plomo se está acumulando en su cuerpo.

Es el nivel que comúnmente se encuentra en adultos, en los Estados Unidos. →

¿Que acción se requiere?

Para aquellos trabajos de la construcción donde el plomo está presente. Los pasos descritos aquí son requeridos por las regulaciones de Cal/OSHA.

50 o MÁS ALTO

- Usted *debe* ser retirado de su trabajo que lo expone al plomo hasta que el nivel de plomo en su sangre baje a 40 µg/dl o menos, en dos examenes consecutivos. Si no existen tareas que pueda desempeñar fuera del peligro de plomo, Ud. *debe* recibir su salario completo y sus beneficios mientras no trabaja.
- Su patrón *debe* hacer los arreglos necesarios para que lo examine un médico y se le haga un análisis de plomo en la sangre, todo esto sin costo ninguno para usted.

40 a 49

- Su patrón *debe* hacer los arreglos para que lo examine un médico una vez al año y le haga un análisis de plomo en la sangre cada dos meses, hasta que su nivel baje a menos de 40.

39 o menos

- Es recomendable que usted vaya a un médico para que le haga un análisis de plomo en la sangre cada seis meses. Puede que su patrón tenga que pagar estos gastos.
- Su patrón *debe* hacer los arreglos para que lo examine un médico:
  --si tiene síntomas de envenenamiento con plomo.
  --si quiere consejos acerca de los efectos del plomo, especialmente para averiguar si está afectando su habilidad de tener hijos.
  --si tiene dificultad de respirar al usar un respirador.

Cómo interpretar los resultados del análisis de la protoporfirina de cinc (ZPP) -- ¿cómo es diferente al análisis de plomo en la sangre?

¿Qué mide el análisis de ZPP?
El ZPP mide una sustancia en la sangre que se aumenta cuando el plomo impede la habilidad de formar hemoglobina por medio de las células rojas sanguíneas. (La hemoglobina es la parte de la sangre que transporta el oxígeno.) Se utiliza el ZPP para observar el efecto de la exposición al plomo en el cuerpo.

¿Qué información recibe sobre su exposición al plomo del análisis de ZPP?
El nivel de ZPP sube y baja más lentamente que el nivel de plomo en la sangre. Por eso, el ZPP es un indicador de la cantidad de exposición al plomo durante los últimos 3 a 4 meses.

¿Qué se espera de un nivel de ZPP?
Un nivel de ZPP de 50 µg/dl o menos es lo que se espera en los adultos con poca o ninguna exposición al plomo. Un nivel de ZPP de más de 50 significa, por lo general, que tiene demasiado plomo en el cuerpo.

Departamento de Servicios de Salud del Estado de California — Construcción abril 1995 — Programa de Prevención del Envenenamiento con Plomo Ocupacional

"DEAR EMPLOYEES: Blood-Lead Test Results"

***Employers--Use this letter to let each Spanish speaking worker know the results of his or her blood-lead test.**

***Make a copy for each worker on your company's stationery. Keep a copy of each completed form for your records.**

PARA: _____ FECHA: ____/____/____
[To:] (Date:)

Como debe saber, su trabajo en esta compañía lo puede exponer al polvo y al humo del plomo. Para poder saber si su cuerpo llegó a absorber altos niveles de plomo, una muestra de sangre fue coleccionada y analizada.

Fecha del análisis ____/____/____
(Test Date)

Resultados del análisis _____ ug/dl (microgramas por decilitro)
(Blood Lead Level)

Nivel de ZPP _____ ug/dl (microgramas por decilitro)
(ZPP Level)

Fecha de su próximo análisis ____/____/____
(Next test date)

Para ayudarle a entender los resultados del análisis, por favor lea Como Interpretar los Resultados de sus Examenes de Sangre y ZPP a la vuelta de esta página. Los efectos que el plomo tiene en la salud no se pueden determinar solamente por medio de un análisis de sangre. Si piensa que tiene síntomas por causa del envenenamiento con plomo o si tiene algunas preguntas adicionales, comuníquese con el médico encargado del Programa de Vigiliancia Médica de esta compañía:

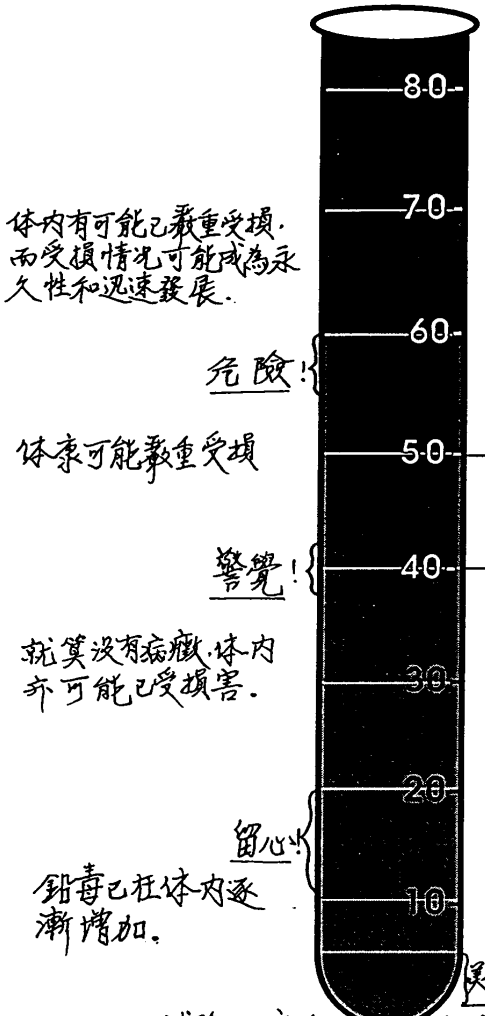
Dr. _____ Teléfono(_____) _____

¿Qué daños a la salud le puede causar el plomo?

El plomo se acumula en el cuerpo poco a poco. Entre más plomo, mayor es la posibilidad de que daños a la salud ocurran. Cantidades grandes del plomo causan daños severos al cerebro, al sistema nervioso, a los riñones, y a la sangre. Puede que usted se encuentre cansado, irritable, con dificultad de concentrarse, o con dolores de cabeza o del estómago. También el plomo le puede causar estreñimiento, diarrea, falta de apetito, dolores musculares o de las articulaciones, y debilidad. El daño puede estar ocurriendo aunque no tenga síntomas. Cada persona responde en forma distinta. El plomo también puede afecter la capacidad de tener un hijo, sea para un hombre o para una mujer.

Departamento de Servicios de Salud del Estado de California — Construccion abril 1995 — Programa de Prevencion del Envenenamiento con Plomo Ocupacional

*明白您的血中含鉛試驗：



体内有可能已嚴重受損，而受損情況可能成為永久性和迅速發展。

体素可能嚴重受損

就算沒有病癥，体内亦可能已受損害。

鉛毒已在体内逐漸增加。

美國成人標準水平。

該怎樣作防止行動？

*加州OSHA机構規定与鉛毒有関的建築工作必須遵從以下各步驟：

50或以過：

- 您必須被調到一個不再和鉛接觸的部位工作，直到有兩次連續驗血低过40才可回復舊職；如果公司不能提供一份安全的工作給您，公司必須在您停職期間負担您的薪金和应有的福利。
- 雇主必須安排您免費見医生檢查和每月一次驗血中含鉛成份。

40至49：

- 雇主应該安排您年見医生一次檢查身体和每兩個月抽血一次檢驗血中含鉛成份，直至血鉛連續兩次低过40為止。

39或低过：

- 雇主必須連續六個月安排每兩個月為您驗血一次；之後就每六個月驗血一次。
- 如果您有以下的情況，雇主必須安排您去見医生檢查：
  - 与鉛毒有関的病癥；
  - 諮詢有関鉛毒会否影响您生育健全孩子的能力，或者；
  - 戴防毒面罩時有呼吸困难的現象。

* 明白您的Z.P.P.試驗——它和血中含鉛水平的結果有何不同：

- Z.P.P. 試驗測量什麽？

—Z.P.P. 測量血中的一种物質，當造"血紅素"的"紅血球"受鉛干扰時，(血紅素乃血液中携帶氧氣的部份)這种物質便會增加。這种試驗和驗血中含鉛水平一齐并用以監察身体所受鉛毒之影响。

- Z.P.P. 驗血結果能告訴些什么関於您接觸鉛毒的程度？

—Z.P.P. 这种物質的水平在血中的升降量比鉛質慢，它能指示出您过去三四個月中所接觸鉛質的數量。

- Z.P.P. 的理想水平是什麽？

—在沒有接觸鉛毒的情況下成年人的Z.P.P.理想水平是50 ug/dl。如果您的Z.P.P.水平高过50 ug/dl.的話，一般来說它可以代表您身体已含有過多的鉛質；除非您另有貧血的情況。

California Department of Health Services Construction Version April 1995 Occupational Lead Poisoning Prevention Program

"DEAR EMPLOYEES: Blood-Lead Test Results"

Employers--Use this letter to let each worker know the results of his or her blood-lead test.	**Make a copy for each worker on your company's stationery. Keep a copy of each completed form for your records.**

敬啓者：_____ 日期：_____

職位：_____

正如所知，您在此公司工作可能會接觸到鉛塵粒或其氣体。為了幫您找出是否体内已吸進过多的鉛毒，我們必須收集您的血樣本来作試驗和分析。

驗血日期：_____。

血鉛水平：_____。

Z.P.P. 水平：_____。

您下次驗血鉛的日期：_____

為使您明白驗血结果，請阅背頁之"明白您的血鉛和Z.P.P檢驗"。然而，單凡一次的驗血，不足以顯示您是否体内已受鉛毒影响。若您認為您有中鉛毒的病癥或有其他问題的話，請和主理您公司的驗血計劃之医生談。

_____ 医生。电話：(　　)_____。

鉛毒會造成体康的什麼損害？

鉛毒會逐漸地在您体内增加，鉛毒越多，則造成傷害的可能性越大。大量的鉛毒可以嚴重地傷害您腦部，神經系，腎臟或血液。您会覚得疲倦难以集中精神，头痛，暴躁，胃痛，沒胃口，便秘，腹瀉，肌肉或骨節痛和身体衰弱等。有此人雖已受其害，但却可能沒有以上的病癥。每個人对鉛毒的反应都不一樣。鉛毒亦可以使您生育不健康的孩子，不管您是孩子的父親或母親。

California Department of Health Services | Construction Version April 1995 | Occupational Lead Poisoning Prevention Program

Confirmation of Receipt of Lead Pamphlet (EPA 406(b)) Before Work Begins

I have received a copy of the pamphlet, *Protect Your Family From Lead in Your Home*, informing me of the potential risk of the lead hazard exposure from renovation activity to be performed in my dwelling unit. I received this pamphlet before the work began.

_____ _____
Printed name of recipient Date

_____
Signature of recipient

Self-Certification Option (for tenant-occupied dwellings only)
If the lead pamphlet was delivered but a tenant signature was not obtainable, you may check the appropriate box below.

☐ **Refusal to sign**--I certify that I have made a good faith effort to deliver the pamphlet, *Protect Your Family From Lead in Your Home*, to the rental dwelling unit listed below at the date and time indicated and that the occupant refused to sign the confirmation of receipt. I further certify that I have left a copy of the pamphlet at the unit with the occupant.

☐ **Unavailable for signature**--I certify that I have made a good faith effort to deliver the pamphlet, *Protect Your Family from Lead in Your Home*, to the rental dwelling unit listed below and that the occupant was unavailable to sign the confirmation of receipt. I further certify that I have left a copy of the pamphlet at the unit by sliding it under the door.

_____
Printed name of person certifying lead pamphlet delivery

_____
Attempted delivery date and time

_____
Signature of person certifying lead pamphlet delivery

_____
_____
_____

Unit Address

Note Regarding Mailing Option - *As an alternative to delivery in person, you may mail the lead pamphlet to the owner and/or tenant. Pamphlet must be mailed at least 7 days before renovation (document with a certificate of mailing from the post office).*

Renovation Notice of Common Areas

For use in notifying tenants of renovations in common areas of multi-family housing.

The following renovation activities will take place in the following locations:

_____
Activity (e.g., sanding, window replacement)

_____
Location (e.g., lobby, recreation center)

The expected starting date is _____ and the expected ending date is _____. Because this is an older building built before 1978, some of the paint disturbed during the renovation may contain lead. You may obtain a copy of the pamphlet, *Protect Your Family From Lead in Your Home*, by telephoning me at _____. Please leave a message and be sure to include your name, phone number and address. I will either mail you a pamphlet or slide one under your door.

_____ _____
Date Printed name of renovator

_____
Signature of renovator

Record of Tenant Notification Procedures--*Procedures Used For Delivering Notices of Renovations in Common Areas*
Project Address:

_____
Street (Apt. #)

_____
City State Zip Code

_____
Owner of Multi-family housing Number of dwelling units

_____
Method of delivering notice forms (e.g., delivery to units, delivery to mailboxes of units)

_____
Name of person delivering notices

_____
Signature of person delivering notices Date of Delivery

Confirmation of Receipt of Lead Pamphlet (1012/1013). As required by Section 35.130 of the Department of Housing and Urban Development's (HUD) regulation 24 CFR 35, I, ________________________, residing at:
(Printed Name of Recipient)

____

____

____
(Address of Occupant)

☐ Have received a copy of the pamphlet, *Protect Your Family From Lead in Your Home*, informing me of the potential risk of the lead hazard exposure associated with the painted surfaces within my dwelling unit and the common areas of this residential property.

________________________________ ________________

(Signature of Recipient) (Date)

— —

(This section to be completed by the owner, agent, or other designated party)

☐ The resident has previously received a copy of the pamphlet, *Protect Your Family From Lead in Your Home*, (_____ at the time of lease signing (or renewal), ____ prior to renovation activities); therefore, it was not necessary to deliver another copy of the pamphlet at this time. (**Note: attach a copy of the Title X or Section 406(b) disclosure form as proof of delivery**).

☐ Resident refused to accept and sign this notification. I certify that I have made a good faith effort to deliver the lead pamphlet to the dwelling unit indicated at the top of this form. I further certify that I have left a copy of the pamphlet at the unit with the occupant.

☐ Resident was unavailable for signature. I certify that I have made a good faith effort to deliver the lead pamphlet to the dwelling unit indicated at the top of this form. I further certify that I have placed a copy of the pamphlet, ***Protect Your Family From Lead in Your Home***:

☐ Under the unit door
☐ In the occupant's mailbox
☐ Other: ________________

____
(Printed name of owner or agent delivering pamphlet)

____
(Signature of owner or agent)

Notice Of Evaluation Activity

In compliance with Section 35.125 of the Department of Housing and Urban Development's (HUD) regulation 24 CFR 35, on _____ (date), lead-based paint hazard reduction activities were conducted. The nature, scope, and locations of these activities are detailed below:

_____

_____

(If additional space is needed, attach pages to this form)

The results of the evaluation activities and clearance tests were received on _____ (date). A summary of these results is outlined below:

_____

_____

(If additional space is needed, attach pages to this form)

Lead-based paint is known to still be present on the following surfaces/components:

_____

_____

(If additional space is needed, attach pages to this form)

_____ _____

(Printed name of recipient or common area where notice shall be posted) (Delivery date or Date of posting and time)

_____ _____

(Signature of recipient, if delivered) (Printed name of person delivering or posting this notice)

_____

(Signature of person delivering or posting this notice)

☐ Resident refused to accept and sign this notification.
☐ Resident was unavailable for signature; therefore, the notice was placed:
- ☐ Under the unit door
- ☐ In the occupant's mailbox
- ☐ Other: _____

For more information about this assessment, please contact:

_____ _____

(Name of contact person) (Phone Number)

_____

(Address of contact person)

Notice Of Lead-Based Paint Presumption

In compliance with Section 35.125 of the Department of Housing and Urban Development's (HUD)\regulation 24 CFR 35, on _____ (date), the owner/management officials of this property elected to presume that all painted surfaces are coated with lead-based paint. The nature and scope of the presumptions made is outlined below:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(If additional space is needed, attach pages to this form)

_____ _____

(Printed name of recipient or common area where notice shall be posted) (Delivery date or Date of posting and time)

_____ _____

(Signature of recipient, if delivered) (Printed name of person delivering or posting this notice)

_____

(Signature of person delivering or posting this notice)

☐ Resident refused to accept and sign this notification.
☐ Resident was unavailable for signature; therefore, the notice was placed:
- ☐ Under the unit door
- ☐ In the occupant's mailbox
- ☐ Other: _____

For more information about this assessment, please contact:

_____ _____

(Name of contact person) (Phone Number)

_____

(Address of contact person)

STATE OF CALIFORNIA — GRAY DAVIS, Governor
DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF OCCUPATIONAL SAFETY & H
455 GOLDEN GATE AVENUE, 10TH FLOOR
SAN FRANCISCO, CA 94102-3677
(415) 703-5100

10 November 1999

Michele Gonzalez Arroyo, M.P.H.
Project Coordinator, Lead-Safe Schools Project
Labor Occupational Health Program
2223 Fulton Street, 4th Floor
Berkeley, CA 94720-5120

Dear Ms. Arroyo:

I am writing in response to your 28 October 1999 requesting a formal interpretation of Title 8, California Code of Regulations, Section §1532.1(d)(2) as regards manual wet scraping and wet sanding of lead-containing paint. In your letter, you indicate that you are developing a training guide for California public elementary school districts for maintenance and custodial personnel who conduct minimal disturbance activity of lead-containing paint.

For this application the Division of Occupational Safety and Health currently considers these activities as "non-trigger tasks" for the following reasons: (1) the scope of work is small in scale and duration, e.g. "removing a cabinet or door hinge that has been painted over," as stated on page 80 of the Training Guide; (2) the wet-sanding or wet scraping activity will consist of "wetting the material continually with the sprayer," as stated in page 79 of the Training Guide; and (3) the employer-school will still conduct initial personal air sampling to determine if employee exposure exists.

I wish you every success with your educational effort to protect school janitors, and other school employees, from exposure to lead.

Sincerely,

John Howard
Chief

JH/jh

cc: Len Welsh
Andy Morita
Scott McAllister
Robert Nakamura
Robert Barish
Robin Baker

CHILDHOOD LEAD POISONING PREVENTION BRANCH

Do I need to be State-certified to do lead-related construction?

DRAFT

California Department of Health Services,
Childhood Lead Poisoning Prevention Branch, Lead-Related Construction Unit

The California Department of Health Services (DHS) certifies people who do lead-related construction. DHS encourages you to become trained and certified to help protect yourself and your clients from lead poisoning. Call the Lead-Related Construction Information Line, at **1-800-597-LEAD** or visit **www.dhs.ca.gov/childlead** for more information about becoming certified.

Will you be inspecting for lead or doing lead clearance testing in California?

If you receive pay for doing lead inspections, risk assessments or clearance inspections, in residential or public buildings in California, State law requires you to be a Certified Lead Inspector/ Assessor. Certified Lead Project Monitors may do clearance inspections only. This law does not apply to activities done to ensure Cal/OSHA compliance (e.g. paint chip or dust wipe sampling) or representative sampling done for waste segregation and disposal purposes. *(Title 17, CCR, §36100(a)(1)).* Call 1-800-597-5323 for more information about this law.

If an owner has hired you to inspect some housing for lead in order to get an exemption from the Federal real estate disclosure rule, you must be State-certified *(Residential Lead-Based Paint Hazard Reduction Act of 1992; Title X, §1018).* This Federal rule also gives home buyers a full 10 days to inspect a home for lead, provided they use a State-certified inspector. Contact the National Lead Information Clearinghouse at **1-800-424-LEAD** for more information about this rule.

Will you be designing lead abatement projects?

If you prepare or design plans for the abatement of lead-based paint or lead hazards from residential or public buildings in California, State law requires you to be a certified Lead Supervisor, Project Monitor or Project Designer *(Title 17, CCR, §36100(a)(1)).* Call 1-800-597-LEAD for more information about this law.

Will you be abating lead in California?

If you do any work designed to reduce or eliminate lead hazards or lead based-paint, from residential or public buildings in California, State law requires you to be a certified Lead Supervisor or Worker *(Title 17, CCR, §36100(a)(1)).* Call 1-800-597-LEAD for more information about this law.

While you do not need to be Certified to do abatement activities designed to reduce or eliminate lead hazards from a building for less than 20 years, you must comply with Title 17 abatement requirements (see page 2 for more information).

Will you be doing lead work in a school?

If you inspect for lead or do lead abatement activities in a **public** elementary school, pre-school or daycare center, State law requires you to be trained and certified *(California Education Code, Section 32243(b)).* Public schools are those that are funded by the State or Federal government.

Will you be exposed to airborne lead dust?

If you are working on a residential or public building and the lead-related construction work you do exposes you to airborne lead at or above the 8-hour permissible exposure limit (PEL) of 50 $\mu g/m^3$, California OSHA regulations require you to be trained and certified *(Title 8, California Code of Regulations Section 1532.1).* Check with your health and safety supervisor about the air monitoring results for your job site. You can also contact the Department of Health Services, Occupational Lead Poisoning Prevention Branch at **(510) 622-4332** for more information about the Cal/OSHA regulations. You can also get information from their website: **www.dhs.ca.gov/ohb**

Are you doing work on a HUD project?

If your lead-related construction project is funded by the U.S. Department of Housing and Urban Development (HUD), or if the work is being done in HUD funded housing, HUD policies may require you to be certified. For example, HUD requires certification for pilot lead abatement projects. Check with your HUD contact person about whether certification is required for your project.

Do your specifications require certification?

Many private and public agencies, such as city or county governments, lenders and funding agencies, are beginning to require State certification for lead-related construction personnel. Check with your local development agencies, lenders, funders and be sure to read your contract and work specifications carefully, **before** you start a job, to see if certification is required.

MORE ☛

Do I need to be State-certified to do lead-related construction? (D2.1-a) (03/01)

You may not need to be certified!

There are some work activities involving lead-based paint and lead hazards that do not required you to be certified. Listed below are some such situations. For more information, call the Lead-Related Construction Information Line at 1-800-597-LEAD and ask to speak to a specialist about whether you need to be certified.

Although certification may not be required for the type of work you plan to do, you may still have to comply with Cal/OSHA standards, California Health & Safety Codes or other regulations when working with lead hazards.

Steel Structure Workers:

California's Title 17 regulations governing accreditation, certification and work practices for lead-related construction do not apply to work done on steel structures. If you do lead-related construction on industrial buildings, warehouses, factories, storage facilities, ships, bridges, tanks, towers or other buildings that are non-residential and generally not open to the public, you are not currently required to be certified.

General Industry Work:

California's Title 17 regulations apply only to work done in the lead-related **construction** field. If you work with lead in an industrial setting, such as in battery manufacturing, radiator repair, metal working, electronics manufacturing, foundry work or welding, you are not required to be certified.

Hobbies:

If you use lead in your hobby, such as stained-glass, re-loading, fishing or lead-toy casting, you are not required to be certified.

Cal/OSHA Compliance Testing:

You are not required to be a certified Lead Inspector/Assessor in order to do testing activities that are designed to ensure compliance with Cal/OSHA work practice standards. Examples of such activities include collecting paint chips, soil, dust wipe and air monitoring samples to test worker lead exposure levels and collecting dust wipe samples to ensure containment.

Waste Segregation Sampling:

You are not required to be a certified Lead Inspector/Assessor in order to do representative sampling of worksite debris, to determine the amount of lead in that debris, for waste segregation and hazardous waste disposal purposes. Examples of such sampling include solid waste (SW-846) testing to determine total metal concentration, and Waste Extraction Testing (WET) or Total Characteristic Leaching Procedure (TCLP) testing to determine soluble metal concentration.

Testing Your Home for Lead:

Only those who are **paid** to do lead inspections are required to be certified Inspector/Assessors. This means that you may take paint chip samples, dust wipe samples, soil samples and use lead testing kits to check for lead hazards in your home or yard without being certified. You may also help a friend or relative test their home or yard for lead, provided you do not receive compensation or pay for doing so.

Renovation, Repair and Repainting Work:

Non-certified people may do renovation, repair or repainting projects on a home, provided the projects are not specifically designed to abate lead hazards.

Maintenance workers for residential and public buildings, such as apartments, schools, stores, theaters and offices, may do operations and maintenance work on those buildings without being certified, provided the work is not specifically designed to abate lead hazards.

Temporary Lead Hazard Control Measures:

Certification is not required for those who design or work on projects intended to reduce lead-based paint or lead hazards from a residential or public building for less than 20 years. Such work, involving methods called "interim controls", is designed to make buildings lead-safe by temporarily controlling, but not permanently removing, the lead-based paint or lead hazards.

IMPORTANT

If you perform projects using interim controls to abate lead-based paint or lead hazards, you must follow the guidelines outlined in Chapter 11 of the U.S. Housing & Urban Development's, *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* (available from HUD User at 1-800-245-2691). You must also comply with California's work practice regulations for lead-related construction *(Title 17, CCR, Sections 36000 and 36100)* including notifying DHS of abatement activities and using containment and work practices that prevent lead contaminated dust, soil or paint debris from spreading to non-work areas.

Do I need to be State-certified to do lead-related construction? (D2.1-a) (03/01)

"DEAR EMPLOYEES: About Air Sampling"

- Employers-Use this sample letter to let all your employees know what air sampling is all about, and what they will be expected to do.
- Make a copy on your company's stationery for each worker, including those who will not be wearing the sampling equipment.

About Air Sampling

Dear

On ___/__/___, tests will be done to find out how much lead is in the air that you breathe while you work. This type of testing is called air sampling and will be done by a person with special training called an industrial hygienist. Information from these tests will help me find out if this shop has too much lead in the air. If there is too much, I plan to reduce the amount of lead in the air you breathe. The purpose of reducing the amount of lead in the air is to protect your health. For this reason, it is very important that you cooperate fully.

Here's what's involved in air sampling. You and other employees who breathe in lead while you work, may be asked to wear a small, light-weight pump on a belt around your waist for the whole day. This pump is connected by a tube to a small filter which will be attached to your collar. Shop air is sucked through the filter and lead dust and fumes are collected on the filter. The filter will be sent to a laboratory, where the amount of lead will be determined. It usually takes about 2-4 weeks to get the results back.

Within five days after I receive these results, I'll inform you of them in writing, with an explanation of what they mean. I'll also let you know the steps I plan to take, if any are necessary, to reduce the amount of lead in the air that you breathe.

While you wear the sampling pump, don't change anything about the way you ordinarily do your job. Please tell the industrial hygienist if anything unusual happens during the shift, which might increase or decrease the amount of lead in the air you breathe- example if you repair more radiators than usual, or less than usual, or if you run a header. Please count the number of copper/brass radiators that you repair during your shift and give this information to the industrial hygienist. The hygienist will check your sampling pump from time to time to be sure it's working correctly-tell him/her immediately if you think your pump has shut off. Please feel free to ask the hygienist any questions about the air sampling.

Please let me know if you have any questions. Thank you for your cooperation.

"DEAR EMPLOYEES: Air Sampling Results"

- Employers-Use this letter to let each worker know the results of any air sampling, This should be done both for workers who wear the air sampling equipment and for others who are not tested but who do the same type of work.
- Make a copy far each worker on your company's stationery. Keep a copy of each completed form for your own files.

To: Date: ___/__/____

Employee _____

Position _____

Street _____

city, zip _____

Air Sampling Results

As you know, your work in this company may expose you to lead dust or fumes. Air sampling was done recently to find out how much lead is in the air you breathe.

Sampling date: ___/__/____

Sampling results: _____ $\mu g/m^3$ (micrograms per cubic meter)

The sampling equipment was worn by:
_____you
_____another worker doing the same job you do

Please read Understanding Air Sample: Results (written by the California Department of Health Services) on the back of this page, to help you understand your air sampling results. If you have any additional questions, please contact me.

To make sure you are not exposed to too much lead, this company intends to take any actions that are circled on the back of this page or that are described below:

This notification is required by Cal/OSHA regulations.

Understanding Air Sample Results

If the result is below 30 $\mu g/m^3$, the risks to your health are low, and OSHA requires no further action.

If the result is between 30-50 $\mu g/m^3$ exposures high enough to damage health might be occurring. OSHA requires the company to:

- provide blood-lead tests (every 1-6 months).
- repeat the air sampling (within 6 months)
- provide workers with training on lead safety

If the result is between between 50 and 150 $\mu g/m^3$ damage to health is likely to occur if it continues for months or years. OSHA requires the company to:

- reduce exposures to 50 $\mu g/m^3$ or below, by installing special equipment such as ventilation systems that collect lead dust and fumes
- provide you with a respirator and require you to use it until exposures have been reduced
- provide clean work clothing, showers, and separate lunch room
- provide blood-lead tests (every 1-6 months)
- repeat the air sampling (within 3 months)
- provide workers with training on lead safety

If the result is above 150 $\mu g/m^3$ health may be damaged in a relatively short time. OSHA requires the company to take all of the actions above *and* to provide clean work clothing *daily*.

"DEAR EMPLOYEE:Resultados De La Evaluación Del Aire" (Air Sampling Results-Spanish)

Employers-Use this letter to let each worker know the results of any air sampling. The content of this letter is the same as the English versión.

Make a copy for each worker on your company's statiónery. Keep a copy of each completed form for your own files.

Para: Fecha __/__/__

Nombre _____

Cargo _____

Dirección _____

Cuidad/Zona Postal _____

Resultados De La Evaluación Del Aire

Cómo debe saber el trabajar en ésta industria lo puede exponer al polvo o emanaciónes del plomo. Recienternente hicimos una evaluación del aire del lugar donde trabaja para poder saber cuánto plomo hay en el aire que usted respira.

Fecha de la evaluación

Resultados de la evaluación _____ $\mu g/m^3$ (microgramos par metro cubico)

El equipo de evaluación lo uso:
__usted
__otro trabajador que hace el mismo trabajo que usted.

Par favor lea la siguiente sección Cómo Entender los Resultados de la Evaluación del Aire (escrita par el Departamento de Servicios de Salud) para que le ayude a entender los resultados aquí presentes. Si tiene alguna pregunta par favor comuníquese conmigo.

Para asegurarnos de que usted no está exponiéndose excesiuamente al plomo, nuestra empresa tiene la disposición de tomar las medidas que se encuentran marcadas con un círcuio al reverso a descritas a cantinuación.

Este oviso es un requisito legal de OSHA.

Cómo Entender Los Resultados De La Evaluación Del Aire

Si el resultado de la evaluación del aire es menos de 30 $\mu g/m^3$ el riesgo que el plomo presenta a su salud es pequeño y OSHA no requiere que se tome ninguna otra medida.

Silos resultados de la evaluación se encuentran entre 30 y 50 $\mu g/m^3$, OSHA requiere que se tomen las medidas descritas a contrinuación debido a que su salud pueden ser afectada.

- Proveer análisis de sangre (cada mes o seis meses)
- Hacer otra evaluación del aire (a mas trardar al cabo de seis meses)
- Darle a los trabajadores entrenamiento acerca de cómo trabajar con seguridad
- con el plomo.

Silos resultrados se encuentran entre 50 y 150 $\mu g/m^3$, es muy probable que su salud se encuentre afectada si la exposición continua por meses o años. OSHA requiere que la empresa tome las siguientes medidas.

- Reduzca la exposición a *50* $\mu g/m^3$ o a meños al instalar equipo especial cómo lo es el trippo de ventilación que recoge el polvo y vaho del plomo.
- Proveer a los trabajadores con respiradores y exigir que se utilizen hasta que la exposición excesiva al plomo haya sido controlada.
- Brindarle a los trabajadores ropa de trabajo limpia y un cuarto aparte donde puedan comer.
- Proveer analisis de sangre (cada mes o seis meses)
- Hacer otra evaluación del aire (a mas tardar al cabo de tres meses)
- Darle a los trabajadores entrenamiento acerca de cómo trabajar con seguridad con el plomo.

Silos resultados de la evaluación se encuantra por encima de 150 $\mu g/m^3$, la salud puede llegar a ser afectada en muy poco tiempo. OSHA requiere que la empresa tome todas las medidas descritas anteriormente y que se facilite *diariamente* ropa de trabajo limpia para todos los trabajadores.

California and HUD Lead-Based Paint Regulations: A Summary

California Department of Health Services, Childhood Lead Poisoning Prevention Branch,
Lead-Hazard Reduction Section (May 2001)

General Information:

The State of California is recognized by the U.S. Environmental Protection Agency (EPA) as an authorized state lead program. As such, California is authorized to accredit training providers and certify lead-related construction professionals in disciplines related to lead-hazard evaluation and control. The California Department of Health Services (DHS), through its Childhood Lead Poisoning Prevention Branch, (CLPPB), has regulations at 17CCR §35001, et seq., (Title 17) that define and describe the accreditation and certification program and establish lead-hazard evaluation and work practice standards. Additionally, Cal/OSHA, at 8CCR §1531.2, has set its own regulatory standard for the safety of workers involved in lead-related construction. Copies of California's regulations can be found at: **http://www.dhs.ca.gov/childlead.**

The U.S. Department of Housing and Urban Development (HUD) also has regulations to protect young children from lead-based paint hazards in housing that is financially assisted or owned by the federal government. The regulations, "Requirements for Notification, Evaluation, and Reduction of Lead-Based Paint Hazards in Federally Owned Residential Property and Housing Receiving Federal Assistance," (commonly referred to as "1012/1013") went into effect on September 15, 2000. Copies of HUD's new regulation can be found at: **www.hud.gov/offices/lead.**

Types of Facilities Covered by California's Lead Hazard Reduction Regulations and HUD Regulations:
California's lead hazard reduction regulations affect all public access and residential buildings (including schools) where lead-based paint is or may be present. HUD's regulations affect housing that is federally owned or receiving federal assistance in all fifty states. The 1012/1013 rule covers CDBG, HOME, HOPWA, and Section 8 housing and requires that these programs also meet state and local standards. Because of this, California's Title 17 applies in all situations.

1. **General requirements regarding lead-related construction that apply to rehabilitation, maintenance and repair work that disturb painted surfaces in properties covered by HUD's new lead paint regulation:**
   - Cal/OSHA regulations require, at minimum, a hazard awareness program; and, if employees are exposed to airborne lead at or above the permissible exposure limit (50 $\mu g/m^3$) the employee and supervisor must be certified by CLPPB in lead-related construction.
   - California law requires that anyone who disturbs a lead-painted (or presumed) surface in any type of building must use containment to prevent migration of the lead-contaminated hazard to an area outside of the work area or they may be guilty, under both state and federal regulations, of creating a lead hazard.
   - California will accept completion of any of HUD's lead-safe work practices courses including both the Operations & Maintenance and Renovation & Remodeling one or two-day training courses as acceptable training for HUD-associated remodeling & renovation work. These courses do not make the student certified in any of California's lead-related construction disciplines. Individuals not certified by DHS in lead-related construction, yet claiming to be, will be prosecuted to the fullest extent allowable by law.
   - In the future, DHS may develop and/or approve other training courses that meet the requirements set forth in HUD's 1012/1013 rule.

2. **Certification requirements for abatement activities designed to last for greater than twenty years (i.e., permanent abatement).**
   - Individuals engaged in the permanent removal of lead-based paint or in permanently eliminating lead hazards (designed to last greater than twenty years) must be certified by DHS in lead-related construction under both Title 17 and 1012/1013. The California Department of Health Services currently certifies the following disciplines:
     - Inspector/Assessor
     - Project Monitor
     - Project Designer
     - Supervisor
     - Worker
   - For permanent abatement, California requires both lead-related construction certified Supervisors and workers.

3. **Certification requirements for non-permanent abatement activities (interim controls).**
   - California does not require certification of supervisors or workers for abatement activities designed to last less than twenty years - except where a child is found to have an elevated blood lead level and the local jurisdiction orders the hazard abated.

Comparison of California's 17 CCR §35001 et seq. and HUD 1012/1013 (April 2001)

- HUD 1012/1013 projects require a DHS lead-related construction certified Supervisor to be present during abatement activities designed to last less than twenty years if the workers performing the abatement have not taken a HUD-approved training course. Untrained workers cannot be supervised by an individual not certified as a Lead-Related Construction Supervisor.
- For HUD 1012/1013 projects where the abatement is designed to last less than twenty years and the workers have attended a HUD-approved training course, a DHS Lead-Related Construction is not required to be present at the work site.

4. **Clearance activities (surface wipes):**
   - California regulations allow only DHS lead-related construction certified Inspector/Assessors to perform lead hazard evaluations and allow DHS certified Project Monitors to perform clearances (considered a type of lead hazard evaluations).
   - DHS does not yet certify lead Sampling Technicians, but expects to in the future. To keep up to date on the Sampling Technician certification in California, please check our website (click on the "Materials" section).
   - Lead dust Sampling Technicians certified by other states cannot be used to provide clearances for post-renovation projects as required by 1012/1013.
5. **Accreditation of Training Providers:**
   - Training providers must be accredited by DHS to teach lead-based paint evaluation and lead-related construction courses. Accreditation is not required for neither the R&R course nor the O&M course.
   - Training providers accredited in other states or by the Environmental Protection Agency may not offer training without receiving DHS accreditation.
6. **Clearance Levels:**
   - Clearance levels used to determine compliance with California's Lead-hazard reduction regulations are:
     - Interior floors: 50 $\mu g/ft^2$
     - Interior horizontal window surfaces: 250 $\mu g/ft^2$
     - Exterior horizontal window surfaces and floors: 800 $\mu g/ft^2$
     - Bare soil (play areas): 400 ppm
     - Bare soil (all other areas): 1000 ppm
   - HUD's 1012/1013, clearance levels are lower than California's in these areas:
     - Interior floors: 40 $\mu g/ft^2$
     - Exterior horizontal surfaces and floors 400$\mu g/ft^2$
   - Remember that California levels always apply, but that under 1012/1013, HUD's interior floor and exterior horizontal window and floor clearance level will apply during HUD regulated activities.
7. **Requirements that apply to Notification of Lead Hazard Evaluations**
   - California requires that the Inspector/Assessor or Project Monitor notify DHS within thirty days of the completion of any Lead Hazard Evaluation. This notification applies to all Risk Assessments, Paint Inspections, Lead Hazard Screens and clearances conducted in public or residential facilities. Notifications are to sent to CLPPB on a DHS Form 8552. This form is downloadable from CLPPB's website.
   - HUD requires that notification forms are posted and must be within 15 days of the completion of the evaluation.
8. **Notification of Lead-Related Construction Activities:**

   California's regulations require that notification occur during these circumstances:
   - When abating a lead hazard in a public or residential building, CLPPB must be notified using the DHS Form 8551, no less than five days prior to the abatement.
   - The tenants of the facility being abated must be notified at least five days prior to the abatement by posting copies of DHS Form 8551 at all entrances to the facility.
   - HUD requires separate notification to tenants no more than 15 days after the completion of the lead-related construction activity. The notices must be posted and they must include the clearance results.
9. **Additional Information:**

   Please contact:

   Department of Health Services
   Childhood Lead Poisoning Prevention Branch
   Lead Certification Unit
   1515 Clay Street, Suite 1801, Box C
   Oakland, CA 94612

   Or visit CLPPB's website at:

   http://www.dhs.ca.gov/childlead

   If you have questions about eligibility requirements or how to apply call:
   1-800-597-LEAD, (1-800-597-5323)
   Outside California, dial (510) 622-5072

Information About Lead in the Workplace

Occupational Lead Poisoning Prevention Program (OLPPP)
in the Occupational Health Branch (OHB)
California Department of Health Services (CDHS)

OLPPP provides information on lead in the workplace, and educational and training materials to workers, employers and health professionals in California. Write to:

OLPPP/OHB/CDHS
1515 Clay Street, Suite 1901
Oakland, CA 94612

Call (510) 622-4332 for assistance or to request specific lead education and training materials. Leave a message in English or Spanish and a staff person will get back to you. Information is also available on the website: www.ohb.org

Childhood lead poisoning issues: contact the California Department of Health Services Childhood Lead Poisoning Prevention Branch at (510) 622-5006 or your local county health department. Information is also available on the website: www.childlead.com

Information About Other Workplace Hazards

Hazard Evaluation System and Information Service (HESIS) in the Occupational Health Branch (OHB)
California Department of Health Services California Department of Industrial Relations. Provides information on workplace health hazards to workers, employers, and health professionals in California.

HESIS - TRS
1515 Clay Street, Suite 1901
Oakland, CA 94612

Call (510) 622-4317 to obtain information about hazards in the workplace,
Call (510) 622-4328 to order specific HESIS publications.
Call (510) 622-4318 for information in Spanish.
Information is also available on the web site: www.ohb.org

Contact the **National Institute for Occupational Safety & Health (NIOSH)** for information on workplace hazards call the toll-free hot line, 1-800-356-4674.
http://www.cdc.gov/niosh/homepage.html
The National Institute for Occupational Safety and Health (NIOSH) 800-number is a toll-free technical information service that provides convenient public access to NIOSH and its information resources. The service is available to anyone in the continental United States, Alaska, Hawaii, Puerto Rico, or the Virgin Islands. Callers may request information about NIOSH activities, order NIOSH publications, or request information about any aspect of occupational safety and health. However, this toll-free number is NOT a hotline for medical emergencies.

NIOSH, *Guide to Industrial Respiratory Protection*, DHHS (NIOSH) Publication No. 78-193B.

State of California University Based Occupational And Environmental Health Clinics

Many doctors do not have experience in treating patients with lead poisoning or other work-related health problems. Employers who want to contact experts in lead-related health effects and other occupational and environmental health problems can contact the following clinics.

SOUTHERN CALIFORINIA

Irvine
Center for Occupational and Environmental Health
University of California, Irvine
19722 MacArthur Boulevard
Irvine, CA 92612
(949) 824-8641
Contact: Mary Koebler, RN, COHN

Los Angeles Area
UCLA Occupational/Env. Medicine Clinic
University of California, Los Angeles
10911 Weyburn Ave., Suite 344
Los Angeles, CA 90024-7027
(310) 794-8144
Contact: Phillip Harber, MD

Drew University of Medicine and Science
The Environmental Research Center
1621 East 120th Street
Los Angeles, CA 90059
1 (800) 351-5323
Contact: Maria Diaz

San Diego
Occupational Health Center
University of California, San Diego
330 Lewis Street, Suite 100
San Diego, CA 92103
(619) 294-6206
Contact: Therese Rymer, RN, NP

NORTHERN CALIFORNIA

San Francisco Bay Area
San Francisco General Hospital
University of California, San Francisco
Div. of Occupational /Env. Medicine

Building 30, 5th Floor
1001 Potrero Avenue
San Francisco, CA 94110
(415) 206-4320
Contact: Denise Sousa, NP

University of California, San Francisco
Occupational Health Services
2186 Geary Blvd., Suite 103
San Francisco, CA 94115
(415) 885-7580
Contact: Leslie Israel, DO, MPH

Sacramento
Occupational Medicine Clinic
University of California, Davis
2221 Stockton Blvd
Sacramento, CA 95817
(916) 734-8393 for appointments
(530) 752-8051 for consultation
Contact: Steven McCurdy, MD

For a complete list of independent occupational and environmental health clinics contact:

The Association of Occupational and Environmental Clinics, 1010 Vermont Ave., N. W., Suite 513, Washington, D.C. 20005, (202) 347-4976.

Workplace Health and Safety Assistance

California Division of Occupational Safety and Health (Cal/OSHA) the California Department of Industrial Relations offers a free industrial hygiene and safety consultation service for employers.

Employers in California who want help in identifying and correcting safety and/or health hazards in their workplace can obtain the free, on-site technical assistance of this Service. Although enforcement and consultation are both functions of the Division of Occupational Safety and Health, the Consultation Service is separate and distinct from the enforcement branch. To request a consultation visit contact:

Cal/OSHA Consultation Service Headquarters
Division of Occupational Safety and Health
455 Golden Gate Ave., 10th Floor
San Francisco, CA 94102
(415) 703-5270
or 1 (800) 963-9424
or check for the location nearest to your business

Southern California Area
6150 Van Nuys Blvd., Suite 307
Van Nuys, CA 91401

(818) 901-5754

Northern California/ Central Valley
2424 Arden Way, Suite 410
Sacramento, CA 95825
(916) 263-2855

Training and Education Unit
2211 Park Towne Circle, Suite 4
Sacramento, CA 95825
(916) 574-2528

High Hazard Employer Assistance Unit
1901 N. Gateway Blvd., Suite 102
Fresno, CA 93727
(209) 454-0615

San Francisco Bay Area
1515 Clay Street, Suite 1103
Oakland, CA 94612
(510) 622-2891

San Diego/ San Bernardino
7827 Convoy Court, Suite 406
San Diego, CA 92111
(619) 467-4048

Voluntary Protection Program
455 Golden Gate Ave., 10th Floor
San Francisco, CA 94102
(415) 703-5270

Special Emphasis Program Unit
10350 Heritage Park Dr., Suite 201
Santa Fe Springs, CA 90670
(562) 944-9366

California Division of Occupational Safety and Health (Cal/OSHA) in the California Department of Industrial Relations.

Cal/OSHA enforces workplace health and safety regulations (including the lead standard regulations) in California. Headquarters: 455 Golden Gate Ave., 10th floor, San Francisco 94102, (415) 703-5100. Information is also available on the website: www.dir.ca.gov

Federal Occupational Safety and Health Administration (Fed/OSHA): has jurisdiction over employees of the federal government, on U.S. properties, or in maritime. Contact Fed/OSHA at 1-800-475-4019. http://www.osha.gov/ (Homepage)

U.S. Department of Labor

Occupational Safety and Health Administration (OSHA)
200 Constitution Avenue, N.W.
Washington, D.C. 20210

In case of emergency call 1-800-321-OSHA

- OSHA, Personal Protective Equipment, Publication No. OSHA 3077.
- OSHA, Personal Protective Equipment Standards, 1910.132, 1910.133, 1910.135, 1910.136.
- OSHA, Respirator Standard, 29 CFR 1910.134
- OSHA, "Hazard Communication" webpage …

http://www.osha-slc.gov/SLTC/hazardcommunications/index.html

Other Lead Information

The **National Lead Information Center** toll free hotline, 100-LEAD-FYI (800)-532-3394), provides people throughout the U.S. with information about lead poisoning prevention. Persons calling the hotline can request an English or Spanish language information packet describing how to protect children from lead poisoning. The Hotline is designed to provide basic information to the general public. Information is also available at the website: www.epa.gov/lead/nlic.htm

The National Lead Information Center also operates a Clearinghouse designed to provide more in-depth, technical and non-technical information on lead-related issues. The Clearinghouse, also available through a toll-free number, 1-800-424-5323, is staffed by information specialists who can provide answers to specific questions.

American Lung Association
http://www.lungusa.org/ (Homepage)

The American Lung Association
1740 Broadway
NY, NY 10019
212-315-8700

- *What You Should Know About On-The-Job Respiratory Protection*, ALA. Item No. 0683.

Leadlisting (for information on lead-related service providers throughout the U.S.) www.leadlisting.org (homepage). ***The Lead Listing*** has been developed to help consumers locate qualified lead service providers (lead inspectors, risk assessors, and abatement contractors), renovators trained in lead-safe practices (lead-trained renovators) and recognized lead analysis laboratories in a timely fashion.

Information About Lead-Related Construction Training Certification

Lead Accreditation and Certification Unit, Childhood Lead Poisoning Prevention Branch, California Department of Health Services: is the state government program responsible for providing training certification for lead-related construction in the categories of worker, supervisor (contractor), inspector/assessor, project monitor and designer. It also accredits

(approves) the training programs. For information on how to become certified and a list of current accredited training programs contact them at:

1515 Clay Street, Suite 1801, Box C
Oakland, CA 94612

Information Line: 1-800-597-5323
Outside California (510) 622-5012

Information is also available on the web site at: www.childlead.com

Information About Other Training Programs

Labor Occupational Health Program: Provides training sessions, publications, films, and technical assistance on occupational health and safety issues for Northern California. Based at University of California, Berkeley, 2223 Fulton Street, 4th floor, Berkeley, CA 94720; (510) 642-5507

Labor Occupational Safety and Health Program: Provides training sessions, publications, films, and technical assistance on occupational health and safety issues for Southern California. Based at University of California, Los Angeles, 6350 B Public Policy Building, Box 951478, Los Angeles, CA 90095; (310) 794-5964

Respirator training: assistance in respirator selection, fit-testing and checking, as well as respirator fit testing and checking training kits is available from the manufacturers or safety supply distributors that employers purchase from.

Workers' Compensation Information

Workers' Compensation Insurance Coverage:
If employees suffer from a work-related illness or injury they are eligible for workers' compensation benefits and medical cares Employers who have questions about their insurance coverage for workers' compensation should contact their workers' compensation insurance carrier.

For information about employees' rights to benefits and medical care: Look in the state government section near the front of the telephone book under "California State of, Industrial Relations Department of, Division of Workers' Compensation, Information and Assistance" or call 1-800-736-7401. Information is also available on the website:
www.dir.ca.gov

Health and Safety Services Provided by Workers' Compensation Insurance Companies to Employers:

Under the workers compensation reform laws, insurance companies are now required to provide health and safety services to companies they insure. Also, with the abolition of the minimum rate (state-set, fixed-priced insurance ratings) employers will no longer be charged a minimum premium. Insurance companies must now compete with each other to offer better pricing and services.

To learn more about what services are provided contact your insurance company or the Division of Occupational Safety and Health, Loss Control Certification Unit, 1515 Clay Street, Suite 301, Oakland, CA 94612; (510) 622-3276.

State Compensation Insurance Fund: is the workers' compensation insurance company for many employers in California and has available health and safety materials and information (for companies insured by them).
Home office is: 1275 Market Street, San Francisco, CA 94103; (415) 565-1234 Health and Safety Office (415) 565-1073, Video Library (415) 565-1072

Lead Information for Residential Property

The Department of Housing and Urban Development (HUD)
www.hud.gov/lea (homepage)

US Department of Housing and Urban Development
451 7th Street SW
Washington, DC 20410
(202) 401-0388
(202) 708-1455 (TTY)

NLLAP Accredited Laboratories in California

This is a listing of National Lead Laboratory Accreditation Program (NLLAP) accredited laboratories in California. The U.S. Environmental Protection Agency (EPA) has recognized these laboratories for meeting NLLAP laboratory performance requirements and for demonstrating they can accurately analyze for lead in paint chip, dust and/or soil samples associated with the abatement and control of lead-based paint.

Please note that NLLAP accredited laboratories exist in other states and you are not restricted to using only labs located in California. You may send your samples, by mail, to an out-of-state laboratory. The amount of time it takes for an out-of-state laboratory to analyze your samples and send you the results is comparable to that of a laboratory within California. Furthermore, out-of-state laboratories may charge less to analyze your samples. For a list of NLLAP accredited laboratories in other states, call the National Lead Information Clearinghouse at (1-800-424-LEAD) or visit the American Industrial Hygiene Association's website at www.aiha.org/ellapsta.html.

Asbestos TEM Laboratories, Inc.
(ID #: 11135)
Berkeley, CA (510) 528-0108
Commercially available.
Accredited to test paint, dust and soil.

Clayton Environmental Consultants, Inc.
(ID #: 11142)
Pleasanton, CA (510) 426-2662
Commercially available.
Accredited to test paint, dust and soil.

Health Science Associates
(ID #: 10985)
Los Alamitos, CA (714) 220-3922
Commercially available.
Accredited to test paint, dust and soil.

Macs Lab, Inc.
(ID #: 11172)
Santa Clara, CA (408) 727-9727
Accredited to test paint, dust, soil and air.

AT Labs (a unit of Assay Technology)
(ID #: 11103)
South San Francisco, CA (415) 952-8501
Commercially available.
Accredited to test paint, dust and soil.

Forensic Analytical Specialties, Inc.
(ID #: 11143)
Hayward, CA (510) 887-8828
Commercially available.
Accredited to test paint, dust, soil and air.

Kellco Services, Inc.
(ID #: 11109)
Premont, CAS510 (510) 659-9751
Commercially available.
Accredited to test paint, dust, soil and air.

Micro Analytical Laboratories, Inc.
(ID #: 11150)
Emeryville, CA (510) 653-0824
Commercially available.
Accredited to test paint, dust, soil and air.

STATE OF CALIFORNIA UNIVERSITY BASED OCCUPATIONAL AND ENVIRONMENTAL HEALTH CLINICS

Clinicians who do not have experience in treating patients with lead exposure or other work related health problems can contact any of the clinics listed below. Physicians considering chelation therapy are strongly urged to consult colleagues with experience and knowledge in handling such cases. These clinics can also provide either direct services or possibly a referral in your community.

SOUTHERN CALIFORNIA

Irvine
Center for Occupational and
Environmental Health
University of California, Irvine
19722 MacArthur Boulevard
Irvine, CA 94612
(949) 824-8641
Contact: Mary Koebler, RN, COHN

Los Angeles
UCLA Occupational/Env. Medicine Clinic
University of California, Los Angeles
10911 Weyburn Ave., Suite 344
Los Angeles, CA 90024-7027
(310) 794-8144
Contact: Phillip Harber, MD

Drew University of Medicine and Science
The Environmental Research Center
1621 East 120th Street
Los Angeles, CA 90059
1(800) 351-5323
Contact: Maria Diaz

San Diego
Occupational Health Center
University of California, San Diego
330 Lewis Street, Suite 100
San Diego, CA 92103
(619) 294-6206
Contact: Therese Rymer, RN, NP

NORTHERN CALIFORNIA

San Francisco Bay Area
San Francisco General Hospital
University of California, San Francisco
Div. of Occupational/Env. Medicine
Building 30, 5th Floor
1001 Potrero Avenue
San Francisco, CA 94110
(415) 206-4320
Contact: Denise Sousa, NP

University of California, San Francisco
Occupational Health Services
2168 Geary Blvd., Suite 103
San Francisco, CA 94115
(415) 885-7580
Contact: Leslie Israel, DO, MPH

Sacramento
Occupational Medicine Clinic
University of California, Davis
2221 Stockton Blvd
Sacramento, CA 95817
(916) 734-8393 for appointments
(530) 752-8051 for consultation
Contact: Steven McCurdy, MD, MPH

Cal/OSHA Injury and Illness Prevention Program Standard—Summary

Cal/OSHA's Injury and Illness Prevention Program (IIPP) standard is found in Title 8 of the California Code of Regulations, sections 1509 and 3203. It requires every California employer to establish, implement, and maintain an effective Injury and Illness Prevention Program (11PP) to promote health and safety in the workplace.

An IIPP must be a written plan that includes all of the following elements:

- Management commitment and assignment of responsibilities. A person (or persons) with the authority and responsibility for carrying out the program must be identified and given management's full support.

- Safety communication system. Employers should communicate with employees about health and safety issues in a language they can understand, and in a manner that does not depend on literacy skills. Communication systems may include safety meetings, written materials, joint labor-management health and safety committees, and/or other communication methods.

- Hazard assessment and control. There must be specific procedures for identifying and evaluating hazards, including periodic inspections of the workplace. Employees should be encouraged to participate in inspections without fear of reprisal. Hazards should be corrected as soon as they are identified, or a target date for correction should be set.

- Accident investigation. There must be a process for investigating work-related injuries and illnesses. Written documentation should be maintained indicating why each accident or near miss" occurred, and what actions can be taken to preclude recurrence.

- Safety planning, rules, and work procedures. There must be a means for ensuring that the safety rules and procedures established for the workplace are followed.

- Training. At a minimum, training and instruction should be provided to all employees when the IIPP is established, and thereafter to all new employees, to all employees with a new job assignment, and whenever new substances, processes, procedures, or equipment are introduced.

The written IIPP must be available to employees. Records must be kept to document that there is an effective program in place. These records should include scheduled inspections, actions taken to correct problems, and types, dates, and providers of training.

Cal/OSHA Hazard Communication Standard—Summary

Cal/OSHA's Hazard Communication (HAZCOM) standard is found in Title 8 of the California Code of Regulations, General Industry Safety Orders, section 5194. It provides workers with the right to information about hazardous chemicals and other hazardous materials used in the workplace. Each California employer must establish a written Hazard Communication Program which includes:

- A detailed list of all hazardous substances in the workplace. (Materials that contain lead, such as paints and coatings, are included.)

- A description of the labeling system used for hazardous substances. Labels must include the name of the hazardous substance, warnings about its health effects and other hazards, and the name and address of the manufacturer, importer, or other responsible party.

- Training about each hazardous substance an employee may be exposed to on the job. Such training must be provided at the time of initial assignment and whenever a new substance is introduced in the workplace. Training must include information on the health effects and other hazards of the substance, the methods used to detect its presence or release, and appropriate protective measures including appropriate work practices, emergency procedures, and personal protective equipment.

- MSDSs (Materials Safety Data Sheets) for all hazardous materials on site. These sheets are provided by the manufacturer and must be made readily accessible to every employee. MSDSs must include:

    - the product name and ingredients
    - physical and chemical characteristics
    - fire, explosion, and reactivity hazards
    - health hazards
    - exposure limits
    - precautions for safe handling and use
    - control measures
    - personal protective equipment
    - emergency and first aid measures
    - spill and leak procedures.

If an MSDS does not exist for a material (like old paint), then the employer should take samples and have them analyzed by a laboratory, or assume that the substance is hazardous and act accordingly.

Both employers and employees benefit from a written Hazard Communication Program in the workplace. Employers can use the information to design engineering controls, substitute less hazardous chemicals, and selects appropriate personal protective equipment for workers.

Title 17, California Code of Regulations—Summary

Title 17, Division 1, Chapter 8, "Accreditation, Certification, and Work Practices for Lead-Based Paint And Lead Hazards," is the key regulation for lead work in California. This summary of its major provisions is based on the revision dated January 8, 1999. The regulation is jointly enforced by the Department of Health Services (DHS) and the Division of Occupational Safety and Health (Cal/OSHA).

This summary emphasizes work practice requirements. To read the complete text of the regulation, check the Department of Health Services' Childhood Lead Poisoning Prevention Program's website at www.childlead.com.

Article 1: Definitions

Provides definitions for terms used throughout the regulation. Key terms include abatement, accreditation, clearance inspection, containment, deteriorated lead-based paint, lead-contaminated dust, lead-contaminated soil, lead hazard, lead hazard evaluation, and presumed lead-based paint.

Article 2: Eligibility Requirements for Accreditation and Course Approval

Describes the requirements for individuals, agencies, and organizations to become approved training providers. It gives the minimum qualifications for instructors and requirements for training equipment, trainee testing, and training records.

Articles 3-10: Training Course Requirements

Describe the specific topics of instruction, number of contact hours, and required training methods for each type of course that training providers may offer. The courses described include: Core Instruction, Lead-Related Construction Inspection and Assessment, Lead-Related Construction Supervision and Project Monitoring, Lead-Related Construction Project Design, Lead-Related Construction Work, Lead-Related Construction Supplemental Supervision and Project Monitoring, Lead-Related Construction Certified Industrial Hygienist, and Continuing Education.

Article 11: Application Requirements and Procedures for Training Provider Accreditation, Renewal, or Course Approval

Provides information about the forms and documents required for making application to the Department of Health Services for accreditation as a training provider, renewal of accreditation, and approval of specific courses.

Article 12: Suspension or Revocation of Accreditation, Provisional Accreditation, or DHS Course Approval

Describes the process for revoking a training provider's accreditation or course approval.

Article 13: Eligibility Requirements and Application Procedures for Certification or Interim Certification

Lists the minimum qualifications for becoming a certified Lead Worker, Lead Supervisor, Lead Project Monitor, Lead Project Designer, and Lead Inspector/Assessor. The application process is discussed as well as the educational level, specific training, experience, and tests that are required for each of these classifications.

Article 14: Suspension or Revocation of Certification or Interim Certification

Discusses the process involved in suspending the certification status of a certified individual.

Article 15: Enforcement

Describes the amount of money allocated to the Division of Occupational Safety and Health annually for costs of enforcing compliance with the training and certification requirements of Title 17.

Article 16: Work Practice Standards

Sets out the requirements that must be followed when evaluating and abating lead hazards in public and residential buildings (including schools). It incorporates the requirements set out in the "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing," U.S. Department of Housing and Urban Development, June 1995 (and as revised in 1997). These "HUD Guidelines" form the basis of work practice regulation for lead jobs in California.

§ 38000: Lead Hazard Evaluation for Public and Residential Buildings

(a) Lead hazard evaluation for public and residential buildings shall:

(1) Be conducted only by a certified lead inspector/assessor. The certified lead inspector/ assessor conducting a lead hazard evaluation shall not conduct abatement on the same structure.

(2) Be conducted in a manner in which paint, dust, and soil samples are tested in accordance with the procedures described in the HUD Guidelines.

(3) Be conducted in a manner in which paint, dust, and soil samples taken for laboratory analysis are analyzed by a laboratory that is recognized by the U.S. Environmental Protection Agency pursuant to United States Code, Title 15, Section 2685(b).

(4) Be documented in a lead hazard evaluation report which shall include a completed Department of Health Services (DHS) Form 8552 (12/97) and the following attachments: a foundation diagram, site map, or sketch of the structure, indicating the specific locations of each lead hazard or presence of lead-based paint, and results of the visual inspection, if applicable; a summary of each testing method, device, and sampling procedure used; a description of testing and sampling locations; and the results of laboratory analysis on collected samples, if applicable, including the name, address, and telephone number of each laboratory.

(b) The certified lead inspector/assessor conducting the lead hazard evaluation for a public or residential building shall retain the original completed copy of DHS Form 8552 (12/97) and attachments for a minimum of three years and distribute copies as follows: a copy of the completed DHS Form 8552 (12/97) and attachments to the person who ordered the lead hazard evaluation; a copy of the completed DHS Form 8552 (12/97) to DHS within thirty days of completion; and a copy of the attachments to DHS upon request.

(c) In addition to the requirements specified in subsections (a) and (b):

(1) A lead inspection shall be conducted in accordance with procedures described in the HUD Guidelines (as revised in 1997).

(2) A risk assessment shall be conducted in accordance with procedures described in the HUD Guidelines and shall include a written description of abatement options for each identified lead hazard, a suggested prioritization for addressing each lead hazard, and recommendations for a maintenance and monitoring schedule.

(3) A clearance inspection shall be conducted by a certified lead inspector/assessor or a certified lead project monitor and in accordance with the procedures described in the HUD Guidelines.

§ 38100: Abatement for Public and Residential Buildings

(a) Abatement for public and residential buildings which is designed to reduce lead paint or lead hazards for a minimum of twenty years shall be conducted:

(1) Only by a certified lead supervisor or a certified lead worker. A certified lead supervisor shall be onsite during all work site preparation and during the post-abatement cleanup of work areas. At all other times when abatement is conducted, the certified lead supervisor shall be onsite or available by telephone, pager or answering service, and able to be present at the work area in no more than two hours.

(2) According to the procedures specified in the HUD Guidelines.

(3) Using containment and in a manner which does not result in contamination of non-work areas with lead-contaminated dust, lead-contaminated soil, or lead-based paint debris.

(4) In accordance with an abatement plan prepared by a certified lead supervisor, certified lead project monitor, or certified lead project designer which shall:

(A) Include the following information:

1. A detailed written description of the measures and management procedures, including containment, that will be utilized during abatement to prevent exposure to lead hazards;

2. A detailed written description of abatement, including methods of abatement and locations of rooms and components where abatement is planned;

3. A recommended schedule for re-inspection, based upon the type of abatement;

4. Instructions on how to maintain potential lead hazards in safe condition.

(B) Be retained and made available to DHS upon request for a period of at least three years by the preparer.

(5) After notification is posted and delivered pursuant to subsection (c). The certified lead supervisor conducting abatement shall retain records of notification for at least three years.

(6) In a manner in which after abatement is completed, a clearance inspection is conducted in accordance with Sections 36000(a) and 36000 (c)(3) of Title 17.

(b) Abatement for public and residential buildings which is designed to reduce lead paint or lead hazards for less than twenty years shall be conducted:

(1) According to procedures specified in the HUD Guidelines.

(2) Using containment and in a manner which does not result in contamination of non-work areas with lead-contaminated dust, lead-contaminated soil, or lead-based paint debris.

(3) In a manner to ensure that the work area has no lead contaminated dust following the completion of abatement.

(4) In a manner to ensure that a clearance inspection is conducted following the completion of abatement, if abatement was conducted in response to an identified case of lead poisoning as defined in Section 105280(b) of the California Health and Safety Code.

(5) After notification is posted and delivered pursuant to subsection (c).

(c) Prior to conducting abatement, the individual conducting abatement shall provide notification by completing an Abatement of Lead Hazards Notification, DHS 8551(12/97), form and:

(1) Posting at all entrances to the work area a copy of the completed form which shall not be removed until abatement has been completed and, for abatement conducted pursuant to subsection (a), a clearance inspection has been completed; and

(2) Delivering a copy of the completed form to DHS. Except for abatement conducted in response to an identified case of lead poisoning as defined in Section

105280(b) of the Health and Safety Code, the completed form shall be delivered to DHS at least five days prior to conducting abatement.

(d) Any individual conducting abatement or disturbing lead-based paint without containment shall permit the Department, or enforcement agencies, as specified in the California Health and Safety Code Sections 17960, 17961, and 17965, to access work areas to determine compliance with the requirements of this section.

NOTE: This standard originally became effective on November 4, 1993, shortly after the federal standard (29 CFR 1926.62). California's standard has since been revised; revisions that represent the additional requirements in California are highlighted by underlining. A copy of the complete Cal/OSHA standard, in a reformatted, easier-to-read version, is available from the Occupational Lead Poisoning Prevention Program at (510) 622-4332. The federal standard is available from Federal OSHA Publications Office at (415) 744-7112.

(a) Scope

This standard covers all construction work where an employee may be exposed to lead, including metallic lead, inorganic lead compounds, and organic lead soaps, but not organic lead compounds.

(b) Definitions

An airborne lead level of 30 $\mu g/m^3$ is called the Action Level (AL). Having airborne lead concentrations at or above the AL triggers certain health and safety measures described in this standard.

(c) Permissible Exposure Limit (PEL)

The 8-hour Permissible Exposure Limit (PEL) is 50 $\mu g/m^3$ of airborne lead. If the work day is longer than 8 hours, the PEL is 400/number of hours worked per day. The employer must ensure that no employee is exposed to lead at concentrations over the PEL.

(d) Exposure Assessment

Exposure assessment must be performed in all workplaces where employees may be exposed to lead.

(d)(2) Protection of Employees During Assessment of Exposure

Three sets of specified tasks (often referred to as "trigger tasks") trigger basic protective measures where lead is present, until the employer performs an employee exposure assessment. (Exposure assessment is an initial determination via air monitoring, or previous monitoring of a very similar job within the last 12 months.)

For all three sets of tasks, employers are required to provide the following basic protective measures until air monitoring indicates exposure levels are at or below the PEL:

- ☐ Appropriate respiratory protection (type of respirator is specified according to assumed airborne lead level and requirements of Table 1).

- ☐ Appropriate personal protective equipment -clean work clothes such as coveralls at least weekly (daily if greater than 200 $\mu g/m^3$ lead in air); gloves, hats, shoes or disposable shoe coverlets, face shields, vented goggles or other appropriate equipment.

- ☐ Change areas with separate storage facilities for work and street clothes - the employer shall assure that employees do not leave the workplace with work clothes or equipment.

- ☐ Hand washing facilities - the employer shall assure that employees wash their hands and face at the end of each work shift.

- ☐ Biological monitoring - consisting of initial or baseline blood sampling for lead and zinc protoporphyrin (ZPP).

- ☐ Training - includes Hazard Communication, respirator and lead training.

Lowest Exposure Trigger Tasks:
Assume exposures greater than 50 and up to 500 $\mu g/m^3$ unless proven otherwise:
- where lead coatings or paint are present:
  - manual demolition of structures
  - manual scraping (dry)
  - manual sanding (dry)
  - heat gun applications
  - power tool cleaning with dust collection system
- spray painting with lead
- any other task where the employer has reason to believe employees may be exposed over the PEL.

Medium Exposure Trigger Tasks:
Assume exposures greater than 500 and up to 2,500 $\mu g/m^3$ unless proven otherwise:
- use of lead-containing mortar
- lead burning
- where lead coatings or paint are present:
  - rivet busting
  - power tool cleaning without dust collection systems
  - cleanup of dry expendable abrasives
  - abrasive blasting enclosure movement and removal

Highest Exposure Trigger Tasks:
Assume exposures greater than 2,500 $\mu g/m^3$ unless proven otherwise:
- where lead coatings or paint are present:
  - abrasive blasting
  - welding
  - cutting
  - torch burning

(d) Exposure Assessment (Air monitoring)
When air monitoring is conducted, the employer shall collect full-shift personal samples representative of an employee's regular, daily exposure to lead. Monitoring should include at least one sample for each job classification in each work area either for each shift or for the shift with the highest exposure level. (For the initial determination, the employer may monitor only those employees expected to have the highest exposure levels.)

(d)(3) Basis of Initial Determination
The basis of initial determination, or initial assessment of employee exposure, will be employee exposure monitoring results and relevant considerations (e.g., observations, complaints) with the following two exceptions:

- ☐ Where the employer has previously monitored for lead exposures, and the data were obtained within the past 12 months during closely similar workplace operations and conditions, the employer may rely on the earlier results; or
- ☐ Where the employer has objective data, demonstrating that a particular product or material containing lead or specific process, operation or activity involving lead cannot result in an employee exposure to lead at or above the AL during processing, use or handling, the employer may rely upon such data instead of implementing initial monitoring. Objective data confirming that materials or surface coatings contain less than 0.06% (600 ppm) of lead may be used to demonstrate that employee exposure will not exceed the AL as long as every unique surface or material has been sampled and analyzed. Note — Objective data are not permitted to be used for exposure assessment in connection with any of the trigger tasks listed under subsection (d)(2):

(d)(6) Frequency of Exposure Assessment

If the initial determination shows exposures less than the AL, no further assessment is needed until there has been a change of equipment, process, control, personnel or a new task has been initiated.

If the initial determination is at or above the AL but at or below the PEL, then monitoring shall be done at least every six months.

If the initial determination is above the PEL, then monitoring shall be done quarterly.

(d)(8) Employee Notification

Within 5 days after completion of the exposure assessment, the employer shall notify each employee in writing of the results which represent that employee's airborne lead exposure.

(e) Methods of Compliance

Exposures over the PEL shall be reduced through engineering, work practice and administrative controls, to the extent feasible. Respirators may be used to supplement other controls.
Prior to the commencement of any job where exposures may reach the PEL, the employer shall establish and implement a written compliance program, describing the lead-emitting activities and the means by which exposures will be controlled.

The compliance program shall provide for frequent, regular jobsite inspections by a person who is capable of identifying lead hazards and has authorization to take prompt corrective measures. Where mechanical ventilation is used, the employer shall evaluate the performance as necessary to maintain effectiveness.

(f) Respiratory Protection

Where respirators are used, they shall be selected on the basis of air monitoring results, with the minimum level of respirator as indicated in Table 1. Until monitoring results are available, the appropriate respirator is determined according to the assumed exposure associated with the task being performed, as per subsection (d)(2).

If an employee exhibits difficulty breathing with the respirator, the employer shall make available a medical examination to determine whether the employee can wear a respirator safely while performing he work.

PAPRs (powered air-purifying respirators) must be provided to any employee who requests one, where a PAPR would provide adequate protection as per Table 1.

Where respirators are used, the employer shall institute a complete, written respiratory protection program in accordance with Cal/OSHA's Respiratory Protection Standard, §5144. The program shall outline procedures for selection, use, training, cleaning and sanitizing, storage, inspection and maintenance of respirators. The program shall be evaluated by regular inspections.

§5144 requires hat any respirators used shall be certified by NIOSH Also, employers shall perform quantitative or qualitative fit testing of respirators at the time of initial fitting, and at least annually thereafter, for employees wearing tight-fitting facepiece respirators.

(g) Protective Work Clothing and Equipment

When an employee is exposed to lead above the PEL (without regard to whether a respirator is worn), or to lead compounds which may cause irritation, the employer shall provide and assure the employee uses appropriate protective work clothing, such as coveralls or other full-body work clothing, gloves, hats, shoes or shoe coverings, and face shields, goggles or other protective equipment as needed.

Work clothing shall be provided at least weekly for employees exposed over the PEL, except daily for those exposed at levels higher than 200 $\mu g/m^3$.

The employer shall provide for the cleaning or disposal of protective clothing and equipment. Clothing to be laundered must be placed in a closed container, labeled to indicate it contains lead, and the launderer must be notified of the potentially harmful effects of lead exposure. Cleaning of protective clothing or equipment by blowing, shaking or any other means that disperses lead into the air is prohibited.

(h) Housekeeping

All surfaces shall be maintained as free as practicable of accumulations of lead.

Vacuums equipped with toxic dust-removing HEPA filters are the preferred method of cleaning surfaces where lead accumulates. Other types of vacuums may not be used.

Shoveling, dry or wet sweeping, and brushing may be used only where HEPA vacuuming has been tried and found to be ineffective.

Use of compressed air for cleaning is prohibited, unless there is a ventilation system to capture the dust created by the compressed air.

(i) Hygiene Facilities, Practices <u>and Regulated Areas</u>

The employer shall assure hat all employees exposed to lead above he PEL wash their hands and face prior to eating, drinking, smoking or applying cosmetics.

The employer shall provide, for ALL employees exposed to lead, adequate hand washing facilities, and assures (in the absence of shower facilities) that employees wash their hands and face at the end of the work shift.

In areas where employees are exposed to lead above the PEL, the employer shall assure that food or beverages are not present or consumed, tobacco products are not present or used and cosmetics are not applied.

Employees exposed to lead above the PEL shall be provided with clean change areas with separate storage facilities for work and street clothing, to prevent cross-contamination.

The employer shall assure that employees do not leave the workplace wearing any protective clothing or equipment that was worn during the work shift.

Shower facilities, soap and towels shall be provided, where feasible, for employees exposed to lead above the PEL, and the employer shall assure that these employees shower at the end of the work shift.

Employees exposed to lead above the PEL shall be provided with a clean lunchroom or eating area. The employer shall assure that the lunch area is kept free from lead accumulation and that employees do not enter the lunch area with protective work clothing or equipment that has not been cleaned by vacuuming or other method that limits dispersion of lead dust.

Employers shall establish regulated areas, where feasible, wherever employees are exposed above the PEL or performing trigger tasks (subsection (d)(2)). Warning signs shall be posted (subsection (m)), and access shall be restricted to authorized persons. Appropriate protective equipment shall be provided to and worn by employees and other persons who enter the regulated area.

(j) Medical Surveillance

The employer shall assure hat he lead medical program (including all medical examinations and procedures performed) is under the supervision of a licensed physician.

The employee has the right to seek a second medical opinion regarding the lead medical evaluation, at the expense of the employer, and if necessary a third physician may be requested to resolve any disagreements between the first two.

Prophylactic chelation, the routine use of chelating drugs to lower blood lead levels in persons occupationally exposed to lead is prohibited.

(j)(2) Biological Monitoring

Initial blood sampling and analysis for blood lead levels (BLL) and zinc protoporphyrin (ZPP) are required for employees performing any of the specified trigger tasks, or for any employee exposed to an air lead level at or above the AL for at least 1 day.

Employees who are or may be exposed at or above the AL for more than 30 days in any consecutive 12 months, must be enrolled in a medical surveillance program, including BLL and ZPP at least every 2 months for the first 6 months, and every 6 months thereafter.

Any employee with a BLL at or above 40 μg/dl shall have a BLL and ZPP every two months until two consecutive samples are less than 40 μg/dl.

Any employee with a BLL above 50 μg/dl shall receive a follow-up ELL within 2 weeks after the employer receives the results of the first test.

For those employees temporarily removed from their jobs involving lead exposure (see subsection (k), Medical Removal Protection), a BLL and ZPP must be provided every month during the removal period.

All analysis of blood samples shall be conducted by a laboratory approved by OSHA.

The employer shall notify all employees, in writing, of their blood sampling results within 5 working days after receipt of the results.

(j)(3) Medical Examinations and Consultations

A medical exam shall be provided annually for all employees who had a BLL at or above 40 μg/dl during the preceding 12 months.

A medical exam shall be provided to any employee who reports signs or symptoms related to lead poisoning, desires medical advice regarding the effects of lead exposure on the employee's ability to produce a healthy child, is pregnant, or has difficulty breathing while wearing a respirator.

A medical exam shall be provided as medically appropriate to any employee removed from his/her usual job involving exposure to lead.

A medical exam shall include: detailed work history, with particular attention to past lead exposure; history and physical exam, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, neurological systems, and pulmonary system if respirators are used; blood pressure measurement; blood sample and analysis including ELL, ZPP, hemoglobin and hematocrit determinations, red cell indices, examination of peripheral smear morphology, blood urea nitrogen, serum creatinine; urinalysis with microscopic examination; pregnancy or male fertility evaluation, if requested by the employee; any other test deemed necessary by the physician.

(k) Medical Removal Protection (MRP)

(k)(1) Temporary Medical Removal and Return

The employer shall remove an employee from work involving exposure to lead at or above the AL on each occasion that a BLL and follow-up test is at or above 50 g/ dl.

An employee who has been removed due to an elevated BLL can return to his/her former job after having two consecutive BLLs at or below 40 μg/dl.

The employer shall remove an employee from work involving exposure to lead at or above the AL on each occasion that a final medical determination results in a medical finding, determination, or opinion that the employee has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

An employee who has been removed due to a final medical determination can return to his/her former job when a subsequent medical determination indicates he/she no longer has a medical

condition which places that employee at increased risk of health impairment from exposure to lead.

(k)(2) Medical Removal Protection Benefits

As long as the job the employee was removed from continues, he employer shall provide up to 18 months of MRP benefits on each occasion that an employee is removed from exposure to lead.

MRP benefits means the normal earnings, seniority and other employment rights, and benefits, as though the employee had not been removed from the former job.

(l) Employee Information, Training and Certification

The employer shall provide information about lead hazards, according to the Hazard Communication Standard (Section 5194), to all employees exposed to lead.

For all employees exposed to lead at or above the AL on any day, exposed to lead compounds that cause eye or skin irritation, or who perform any of the specified trigger tasks, the employer shall provide initial (pre-placement) training that includes: the content of this standard and appendices; the operations that may cause lead exposure at or above the AL; the purpose, proper selection, fitting, use and limitations of respirators; the purpose and description of the medical surveillance program, including the adverse health effects of lead exposure (especially on reproduction); the engineering controls and work practices relevant to the employee's job assignment; he contents of any compliance plan in effect; the location of regulated areas; the prohibition against routine use of chelation agents; the employee's right of access to records.

For all employees exposed to lead at or above the AL on any day, the above training must be provided annually.

(l)(3) Training and Certification for Residential and Public Buildings

All employees and supervisors who are engaged in lead-related construction in residences or buildings generally accessible to the public and shown to be exposed to lead at or above the PEL, shall be trained by state-accredited training providers and certified by the California Department of Health Services (CDHS).

[Call 1-800-597-LEAD for information about accredited training providers and CDHS certrfication.)

(m) Signs

In regulated areas (work areas where employee exposure is above the PEL and/or trigger tasks are performed), the employer shall post a warning sign with the words:

WARNING: LEAD WORK AREA POISON - NO SMOKING OR EATING

(n) Record Keeping

The employer is required to maintain detailed records on exposure assessment, including any objective data used for exemption from air monitoring requirements, medical surveillance and medical removals.

(o) Observation of Monitoring

The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee lead exposure. Observers shall be provided with and use protective equipment if required in he area, receive an explanation of the measurement procedures, observe all steps related to monitoring, and receive copies of the results.

Table 1: Respiratory Protection for Lead Aerosols

	Airborne Lead Concentration	**Required Respirator**
Lowest exposure trigger tasks, or	Not > 500 $\mu g/m^3$ (up to 10 x PEL)	half-mask air purifying with high efficiency P-1 00) filters or half-mask supplied air in negative pressure mode
	Not > 1,250 $\mu g/m^3$ (up to 25 x PEL)	loose-fitting or helmet PAPR* with high efficiency P-1 00) filters, or supplied air in continuous-supply mode (e.g., type CE abrasive blasting respirator in continuous-flow mode)
Medium exposure trigger tasks, or	Not > 2,500 $\mu g/m^3$ (up to 50 x PEL)	Full facepiece air purifying with high efficiency P-1 00)filters, or tight-fitting PAPR* with P-100 filters, or full facepiece supplied air in demand mode, or half-mask supplied air in continuous-flow mode, or SCBA** in demand mode
Highest exposure trigger tasks, or	Not > 50,000 $\mu g/m^3$ (up to 1,000 x PEL)	half-mask supplied air in posifive-pressure mode
	Not > 100,000 $\mu g/m^3$ (up to 2,000 x PEL)	full facepiece supplied air in posifive-pressure mode (e.g. type CE abrasive blasting respirator in positive-pressure mode)
	> 100,000 $\mu g/m^3$ (> 2,000 x PEL)	full facepiece SCBA in positive-pressure mode

Glossary of Symbols, Units of Measure, and Abbreviations

> - symbol meaning "greater than"

x - symbol meaning "times," as in 50 x PEL (50 times the PEL).

ppm - parts per million - The units used to specify the concentration of lead in a material such as a paint chip sample. 1% is equivalent to 10,000 ppm.

$\mu g/dl$ - micrograms per deciliter - The units used to specify the amount of lead in a person's blood sample, i.e., the weight of lead in a deciliter of whole blood.

$\mu g/m^3$ - micrograms per cubic meter - The units used to specify the concentration of lead dust or fume in air. These units are used to express the results of personal air monitoring.

AL - Action Level - A concentration of lead in air of 30 $\mu g/m^3$ averaged over an 8-hour shift.

BLL - blood lead level - A measurement of how much lead is in a person's blood.

HEPA - high efficiency particulate air - A type of filter that efficiently captures very small particles and is used in respirators, vacuums, and ventilation systems for toxic dusts such as lead.

PAPR - powered air-purifying respirator - A respirator equipped with a battery-powered blower which draws air through filters and into the facepiece.

PEL - Permissible Exposure Limit - A concentration of lead in air of 50 $\mu g/m^3$ averaged over an 8-hour shift.

SCBA - self-contained breathing apparatus - Respirator with clean air tank worn on the wearer's back.

ZPP - zinc protoporphyrin - A blood test that can indicate an effect of lead on the blood-forming system. This test is required whenever a BLL is done, and is analyzed from the same blood sample.

Note: When originally effective (November 4, 1993), this standard was identical to the federal standard, 29 CFR 1926.62. California now has some additional requirements which are underlined for emphasis.

Sec. 1532.1. Lead

(a) Scope.

This section applies to all construction work where an employee may be occupationally exposed to lead. All construction work excluded from coverage in the general industry standard for lead by section 5216(a)(2) is covered by this standard. Construction work is defined as work for construction, alteration and/or repair, including painting and decorating. It includes but is not limited to the following:

(1) Demolition or salvage of structures where lead or materials containing lead are present;

(2) Removal or encapsulation of materials containing lead;

(3) New construction, alteration, repair, or renovation of structures, substrates, or portions thereof, that contain lead, or materials containing lead;

(4) Installation of products containing lead;

(5) Lead contamination/emergency cleanup;

(6) Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed, and

(7) Maintenance operations associated with the construction activities described in this subsection.

(b) Definitions.

Action level means employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30 $\mu g/m^3$) calculated as an 8-hour time-weighted average (TWA).

Chief means the Chief of the Division of Occupational Safety and Health or designee.

Lead means metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

NIOSH means the National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Health and Human Services, or designee.

Supervisor means one who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions and who has authorization to take prompt corrective measures to eliminate them. Supervisors shall be trained as required by this section and when required be certified consistent with section (l)(3).

(c) Permissible exposure limit.

(1) The employer shall assure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air (50 $\mu g/m^3$) averaged over an 8-hour period.

(2) If an employee is exposed to lead for more than 8 hours in any work day the employees allowable exposure, as a time weighted average (TWA) for that day, shall be reduced according to the following formula:

Allowable employee exposure (in $\mu g/m^3$) = 400 divided by hours worked in the day.

(3) When respirators are used to limit employee exposure as required under subsection (C) and all the requirements of subsections (e)(1) and (f) have been met, employee exposure may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily TWA exposure.

(d) Exposure assessment.

(1) General.

(A) Each employer who has a workplace or operation covered by this standard shall initially determine if any employee may be exposed to lead at or above the action level.

(B) For the purposes of subsection (d), employee exposure is that exposure which would occur if the employee were not using a respirator.

(C) With the exception of monitoring under subsection (d)(3), where monitoring is required under this section, the employer shall collect personal samples representative of a full shift including at least one sample for each job classification in each work area either for each shift or for the shift with the highest exposure level.

(D) Full shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead.

(2) Protection of employees during assessment of exposure.

(A) With respect to the lead related tasks listed in subsection (d)(2)(A), where lead is present, until the employer performs an employee exposure assessment as required in subsection (d) and documents that the employee performing any of the listed tasks is not exposed above the PEL, the employer shall treat the employee as if the employee were exposed above the PEL, and not in excess of ten (10) times the PEL, and shall implement employee protective measures prescribed in subsection (d)(2)(E). The tasks covered by this requirement are:

1. Where lead containing coatings or paint are present: manual demolition of structures (e.g., dry wall), manual scraping, manual sanding, heat gun applications, and power tool cleaning with dust collection systems;

2. Spray painting with lead paint

(B) In addition, with regard to tasks not listed in subsection (d)(2)(A), where the employee has any reason to believe that an employee performing the task may be exposed to lead in excess of the PEL, until the employer performs an employee exposure assessment as required by subsection (d) and documents that the employee's lead exposure is not above the PEL the employer shall treat the employee as if the employee were exposed above the PEL and shall implement employee protective measures prescribed in subsection (d)(2)(E).

(C) With respect to the tasks listed in subsection (d)(2)(C), where lead is present, until the employer performs an employee exposure assessment as required in subsection (d), and documents that the employee performing any of the listed tasks is not exposed in excess of 500 $\mu g/m^3$, the employer shall treat the employee as if the employee were exposed to lead in excess of 500 $\mu g/m^3$ and shall implement employee protective measures as prescribed in subsection (d)(2)(E) of this section. Where the employer does establish that the employee is exposed to levels of lead below 500 $\mu g/m^3$, the employer may provide the exposed employee with the appropriate respirator prescribed for such use at such lower exposures, in accordance with Table 1 of this section. The tasks covered by this requirement are:

1. Using lead containing mortar; lead burning

2. Where lead containing coatings or paint are present: rivet busting; power tool cleaning without dust collection systems; cleanup activities where dry expendable abrasives are used; and abrasive blasting enclosure movement and removal.

(D) With respect to the tasks listed in subsection (d)(2)(D), where lead is present, until the employer performs an employee exposure assessment as required in subsection (d) and documents that the employee performing any of the listed tasks is not exposed to lead in excess of 2,500 $\mu g/m^3$ (50

x PEL), the employer shall treat the employee as if the employee were exposed to lead in excess of 2,500 $\mu g/m^3$ and shall implement employee protective measures as prescribed in subsection (d)(2)(E). Where the employer does establish that the employee is exposed to levels of lead below 2,500 $\mu g/m^3$, the employer may provide the exposed employee with the appropriate respirator prescribed for use at such lower exposures, in accordance with Table I of this section. Interim protection as described in this subsection is required where lead containing coatings or paint are present on structures when performing:

1. Abrasive blasting,
2. Welding,

3. Cutting, and

4. Torch burning.

(E) Until the employer performs an employee exposure assessment as required under subsection (d) and determines actual employee exposure, the employer shall provide to employees performing the tasks described in subsections (d)(2)(A), (d)(2)(B), (d)(2)(C), and (d)(2)(D) with interim protection as follows:

1. Appropriate respiratory protection in accordance with subsection (f).

2. Appropriate personal protective clothing and equipment in accordance with subsection (g).

3. Change areas in accordance with subsection (i)(2).

4. Hand washing facilities in accordance with subsection (i)(5).

5. Biological monitoring in accordance with subsection (j)(1)(A) to consist of blood sampling and analysis for lead and zinc protoporphyrin levels, and

6. Training as required under subsection (j)(1)(A) regarding section 5194, Hazard Communication; training as required under subsection (l)(2)(C), regarding use of respirators; and training in accordance with section 1510, Safety Instruction for Employees.

(3) Basis of initial determination.

(A) Except as provided under subsections (d)(3)(C) and (d)(3)(D) the employer shall monitor employee exposures and shall base initial determinations on the employee exposure monitoring results and any of the following, relevant considerations:

1. Any information, observations, or calculations which would indicate employee exposure to lead;

2. Any previous measurements of airborne lead; and

3. Any employee complaints of symptoms which may be attributable to exposure to lead.

(B) Monitoring for the initial determination where performed may be limited to a representative sample of the exposed employees who the employer reasonably believes are exposed to the greatest airborne concentrations of lead in the workplace.

(C) Where the employer has previously monitored for lead exposures, and the data were obtained within the past 12 months during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations, the employer may rely on such earlier monitoring results to satisfy the requirements of subsections (d)(3)(A) and (d)(6) if the sampling and analytical methods meet the accuracy and confidence levels of subsection (d)(9).

(D) Where the employer has objective data, demonstrating that a particular product or material containing lead or a specific process, operation or activity involving lead cannot result in employee exposure to lead at or above the action level during processing, use, or handling, the employer may rely upon such data instead of implementing initial monitoring.

1. The employer shall establish and maintain an accurate record documenting the nature and relevance of objective data as specified in subsection (n)(4), where used in assessing employee exposure in lieu of exposure monitoring.

2. Objective data, as described in subsection (d)(3)(D), is not permitted to be used for exposure assessment in connection with subsection (d)(2).

3. Objective data for surface coatings and materials that contain lead shall meet the following methodology:

a. Lead analysis shall be performed for each unique surface coating and material that may constitute a health hazard to employees engaged in activities within the scope of this section and:

b. Analysis of surface coatings and materials shall be performed in a manner that meets the requirements of

subsection (d)(9) and shall be recorded as described in subsection (n)(4).

(4) Positive initial determination and initial monitoring.

(A) Where a determination conducted under subsections (d)(1), (2) and (3) shows the possibility of any employee exposure at or above the action level the employer shall conduct monitoring which is representative of the exposure for each employee in the workplace who is exposed to lead.

(B) Where the employer has previously monitored for lead exposure, and the data were obtained within the past 12 months during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations, the employer may rely on such earlier monitoring results to satisfy the requirements of subsection (d)(4)(A) if the sampling and analytical methods meet the accuracy and confidence levels of subsection (d)(9).

(C) Objective data for an initial assessment that demonstrate surface coating or material that contain lead at concentrations equal to or exceeding 0.06% lead dry weight (600 ppm) demonstrate the presence of lead surface coatings or material that constitute a health hazard to employees engaged in lead-related construction work. The lead concentration of paint or materials is based on the lead content in the nonvolatile components of the surface coating or material such as paint. Objective data as described in this subsection are not permitted to be used in lieu of exposure assessment in connection with lead-related tasks listed in subsection (d)(2).

(5) Negative initial determination.

(A) Where a determination, conducted under subsections (d)(1), (2), and (3) of this section is made that no employee is exposed to airborne concentrations of lead at or above the action level the employer shall make a written record of such determination. The record shall include at least the information specified in subsection (d)(3)(i) of this section and shall also include the date of determination, location within the work site, and the name and social security number of each employee monitored.

(B) Objective data that meet the requirements of subsection (n)(4) for an initial assessment that demonstrate surface coating or material that contain lead at concentrations less than 0.06% lead dry weight (600 ppm) are sufficient to establish a negative determination. The lead concentration of surface coatings or materials is based on the lead content in the nonvolatile components of the surface coating or material such as paint. Objective data as described in this subsection are not permitted to be used in lieu of exposure assessment in connection with lead-related tasks listed in subsection (d)(2).

(6) Frequency.

(A) If the initial determination reveals employee exposure to be below the action level further exposure determination need not be repeated except as otherwise provided in subsection (d)(7).

(B) If the initial determination or subsequent determination reveals employee exposure to be at or above the action level but at or below the PEL the employer shall perform monitoring in accordance with this subsection at least every 6 months. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the action level at which time the employer may discontinue monitoring for that employee except as otherwise provided in subsection (d)(7).

(C) If the initial determination reveals that employee exposure is above the PEL the employer shall perform monitoring quarterly. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are at or below the PEL but at or above the action level at which time the employer shall repeat monitoring for that employee at the frequency specified in subsection (d)(6)(B), except as otherwise provided in subsection (d)(7). The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the action level at which time the employer may discontinue monitoring for that employee except as otherwise provided in subsection (d)(7).

(7) Additional exposure assessments. Whenever there has been a change of equipment, process, control, personnel or a new task has been initiated that may result in additional employees being exposed to lead at or above the action level or may result in employees already exposed at or above the action level being exposed above the PEL, the employer shall conduct additional monitoring in accordance with this subsection.

(8) Employee notification.

(A) Within 5 working days after completion of the exposure assessment the employer shall notify each employee in writing of the results which represent that employee's exposure.

(B) Whenever the results indicate that the representative employee exposure, without regard to respirators, is at or above the PEL the employer shall include in the written notice a statement that the employees exposure was at or above that level and a description of the corrective action taken or to be taken to reduce exposure to below that level.

(9) Accuracy of measurement. The employer shall use a method of monitoring and analysis which has an accuracy (to a confidence level of 95%) of not less than plus or minus 25 percent for airborne concentrations of lead equal to or greater than 30 $\mu g/m^3$. Methods for the determination of lead concentrations of surface

coatings and material shall be determined by methods which have an accuracy (to a confidence level of 95 percent) of not less than plus or minus 25 percent at 0.06% lead dry weight (600 ppm).

(e) Methods of compliance.

(1) Engineering and work practice controls.

(A) The employer shall implement engineering and work practice controls, including administrative controls, to reduce and maintain employee exposure to lead to or below the permissible exposure limit to the extent that such controls are feasible. Wherever all feasible engineering and work practices controls that can be instituted are not sufficient to reduce employee exposure to or below the permissible exposure limit prescribed in subsection (c), the employer shall nonetheless use them to reduce employee exposure to the lowest feasible level and shall supplement them by the use of respiratory protection that complies with the requirements of subsection (f).

(2) Compliance program.

(A) Prior to commencement of the job each employer shall establish and implement a written compliance program to achieve compliance with subsection (c).

(B) Written plans for these compliance programs shall include at least the following:

1. A description of each activity in which lead is emitted; e.g. equipment used, material involved, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices;

2. A description of the specific means that will be employed to achieve compliance and, where engineering controls are required engineering plans and studies used to determine methods selected for controlling exposure to lead;

3. A report of the technology considered in meeting the PEL;

4. Air monitoring data which documents the source of lead emissions;

5. A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.;

6. A work practice program which includes items required under subsections (g), (h) and (i) and incorporates other relevant work practices such as those specified in subsection (e)(5);

7. An administrative control schedule required by subsection (e)(4), if applicable;

8. A description of arrangements made among contractors on multi-contractor sites with respect to informing affected employees of potential exposure to lead and of regulated areas.

9. Other relevant information.

(C) The compliance program shall provide for frequent and regular inspections of job sites, regulated areas, materials, and equipment to be made by a supervisor.

(D) Written programs shall be submitted upon request to any affected employee or authorized employee representatives, to Chief and NIOSH, and shall be available at the work site for examination and copying by the Chief and NIOSH.

(E) Written programs shall be revised and updated at least every 6 months to reflect the current status of the program.

(3) Mechanical ventilation. When ventilation is used to control lead exposure, the employer shall evaluate the mechanical performance of the system in controlling exposure as necessary to maintain its effectiveness.

(4) Administrative controls. If administrative controls are used as a means of reducing employees TWA exposure to lead, the employer shall establish and implement a job rotation schedule which includes:

(A) Name or identification number of each affected employee;

(B) Duration and exposure levels at each job or work station where each affected employee is located; and

(C) Any other information which may be useful in assessing the reliability of administrative controls to reduce exposure to lead.

(5) The employer shall ensure that, to the extent relevant, employees follow good work practices such as described in Appendix B of this section.

(f) Respiratory protection.

(1) General. For employees who use respirators required by this section, the employer must provide respirators that comply with the requirements of this subsection. Respirators must be used during:

(A) Periods when an employee's exposure to lead exceeds the PEL;

(B) Work operations for which engineering controls and work practices are not sufficient to reduce exposures to or below the PEL;

(C) Periods when an employee requests a respirator; and

(D) Periods when respirators are required to provide interim protection for employees while they perform the operations specified in subsection (d)(2).

(2) Respirator program.

(A) The employer must implement a respiratory protection program m accordance with section 5144 (b) through (d) (except (d)(1)(C)), and (f) through (m).

(B) If an employee exhibits breathing difficulty during fit testing or respirator use, the employer must provide the employee with a medical examination in accordance with subsection (j)(3)(A)2 to determine if the employee can use a respirator while performing the required duties.

(3) Respirator selection.

(A) The employer shall select the appropriate respirator or combination of respirators from Table I below.

(B) The employer shall provide a powered air purifying respirator in lieu of the respirator specified in Table I whenever:

1. An employee chooses to use this type of respirator; and

2. This respirator will provide adequate protection to the employee.

(g) Protective work clothing and equipment.

(1) Provision and use. Where an employee is exposed to lead above the PEL without regard to the use of respirators, where employees are exposed to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), and as interim protection for employees performing tasks as specified in subsection (d)(2), the employer shall provide at no cost to the employee and assure that the employee uses appropriate protective work clothing and equipment that prevents contamination of the employee and the employee's garments such as, but not limited to:

(A) Coveralls or similar full-body work clothing;

(B) Gloves, hats, and shoes or disposable shoe coverlets; and

(C) Face shields, vented goggles, or other appropriate protective equipment which complies with section 1516.

(2) Cleaning and replacement.

(A) The employer shall provide the protective clothing required in subsection (g)(1) in a clean and dry condition at least weekly, and daily to employees whose exposure levels without regard to a respirator are over 200 $\mu g/m^3$ of lead as an 8-hour TWA.

(B) The employer shall provide for the cleaning, laundering, and disposal of protective clothing and equipment required by subsection (g)(1).

(C) The employer shall repair or replace required protective clothing and equipment as needed to maintain their effectiveness.

(D) The employer shall assure that all protective clothing is removed at the completion of a work shift only in change areas provided for that purpose as prescribed in subsection (A)(2).

(E) The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area which prevents dispersion of lead outside the container.

(F) The employer shall inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

(G) The employer shall assure that the containers of contaminated protective clothing and equipment required by subsection (g)(2)(E) are labeled as follows:

Caution: Clothing contaminated with lead. Do not remove dust by blowing or shaking. Dispose of lead contaminated wash water in accordance with applicable local, state, or federal regulations.

(H) The employer shall prohibit the removal of lead from protective clothing or equipment by blowing, shaking, or any other means which disperses lead into the air.

(h) Housekeeping.

(1) All surfaces shall be maintained as free as practicable of accumulations of lead.

(2) Clean-up of floors and other surfaces where lead accumulates shall wherever possible, be cleaned by vacuuming or other methods that minimize the likelihood of lead becoming airborne.

(3) Shoveling, dry or wet sweeping, and brushing may be used only where vacuuming or other equally effective methods have been tried and found not to be effective.

(4) Where vacuuming methods are selected, the vacuums shall be equipped with HEPA filters and used and emptied in a manner which minimizes the reentry of lead into the workplace.

(5) Compressed air shall not be used to remove lead from any surface unless the compressed air is used in conjunction with a ventilation system designed to capture the airborne dust created by the compressed air.

(i) Hygiene facilities, practices and regulated areas.

(1) The employer shall assure that in areas where employees are exposed to lead above the PEL without regard to the use of respirators, food or beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied.

(2) Change areas.

(A) The employer shall provide clean change areas for employees whose airborne exposure to lead is above the PEL, and as interim protection for employees performing tasks as specified in subsection (d)(2), without regard to the use of respirators.

(B) The employer shall assure that change areas are equipped with separate storage facilities for protective work clothing and equipment and for street clothes which prevent cross-contamination.

(C) The employer shall assure that employees do not leave the workplace wearing any protective clothing or equipment that is required to be worn during the work shift.

(3) Showers.

(A) The employer shall provide shower facilities, where feasible, for use by employees whose airborne exposure to lead is above the PEL.

(B) The employer shall assure, where shower facilities are available, that employees shower at the end of the work shift and shall provide an adequate supply of cleansing agents and towels for use by affected employees.

(4) Eating facilities.

(A) The employer shall provide lunchroom facilities or eating areas for employees whose airborne exposure to lead is above the PEL, without regard to the use of respirators.

(B) The employer shall assure that lunchroom facilities or eating areas are as free as practicable from lead contamination and are readily accessible to employees.

(C) The employer shall assure that employees whose airborne exposure to lead is above the PEL, without regard to the use of a respirator, wash their hands and face prior to eating, drinking, smoking or applying cosmetics.

(D) The employer shall assure that employees do not enter lunchroom facilities or eating areas with protective work clothing or equipment unless surface lead dust has been removed by vacuuming, downdraft booth, or other cleaning method that limits dispersion of lead dust.

(5) Hand washing facilities.

(A) The employer shall provide adequate hand washing facilities for use by employees exposed to lead in accordance with section 1527.

(B) Where showers are not provided the employer shall assure that employees wash their hands and face at the end of the work shift.

(6) Regulated Area.

(A) Employers shall establish regulated areas, where feasible, for work areas where employees are exposed to lead at or above the PEL or performing the tasks described in subsection (d)(2).

(B) Regulated areas shall be posted with signs as described in subsection (m)(2).

(C) Employers shall restrict access to the regulated area to employees authorized by the supervisor, to representatives of affected employees, as described in subsection (o) and to persons authorized by the Chief or NIOSH.

(D) Each employee authorized to enter the regulated area shall be provided with and be required to wear protective equipment required by subsections (f) and (g).

(J) Medical surveillance.

(1) General.

(A) The employer shall make available initial medical surveillance to employees occupationally exposed on any day to lead at or above the action level. Initial medical surveillance consists of biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels.

(B) The employer shall institute a medical surveillance program in accordance with subsections (j)(2) and (j)(3) for all employees who are or may be exposed by the employer at or above the action level for more than 30 days in any consecutive 12 months;

(C) The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician.

(D) The employer shall make available the required medical surveillance including multiple physician review under subsection (j)(3)(C) without cost to employees and at a reasonable time and place.

(2) Biological monitoring.

(A) Blood lead and ZPP level sampling and analysis. The employer shall make available biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels to each employee covered under subsections (j)(1)(A) and (B) on the following schedule:

1. For each employee covered under subsection (j)(1)(B), at least every 2 months for the first 6 months and every 6 months thereafter;

2. For each employee covered under subsections (j)(1) (A) or (B) whose last blood sampling and analysis indicated a blood lead level at or above 40 μg/dl, at least every two months. This frequency shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 μg/dl; and

3. For each employee who is removed from exposure to lead due to an elevated blood lead level at least monthly during the removal period.

(B) Follow-up blood sampling tests. Whenever the results of a blood lead level test indicate that an employee's blood lead level exceeds the numerical criterion for medical removal under subsection (k)(1)(A), the employer shall provide a second (follow-up) blood sampling test within two weeks after the employer receives the results of the first blood sampling test.

(C) Accuracy of blood lead level sampling and analysis. Blood lead level sampling and analysis provided pursuant to this section shall have an accuracy (to a confidence level of 95 percent) within plus or minus 15 percent or 6 μg/dl, whichever is greater, and shall be conducted by a laboratory approved by OSHA.

(D) Employee notification.

1. Within five working days after the receipt of biological monitoring results, the employer shall notify each employee in writing of his or her blood lead level; and

2. the employer shall notify each employee whose blood lead level exceeds 40 μg/dl that the standard requires temporary medical removal with Medical Removal Protection benefits when an employee's blood lead level exceeds the numerical criterion for medical removal under subsection (k)(1)(A).

(3) Medical examinations and consultations.

(A) Frequency. The employer shall make available medical examinations and consultations to each employee covered under subsection (j)(1)(B) on the following schedule:

1. At least annually for each employee for whom a blood sampling test conducted at any time during the preceding 12 months indicated a blood lead level at or above 40 μg/dl;

2. As soon as possible, upon notification by an employee either that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice concerning the effects of current or past exposure to lead on the employee's ability to procreate a healthy child, that the employee is pregnant, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during use; and

3. As medically appropriate for each employee either removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited pursuant to a final medical determination.

(B) Content. The content of medical examinations made available pursuant to subsections (j)(3)(A)2. - 3. shall be determined by an examining physician and, if requested by an employee, shall include pregnancy testing or laboratory evaluation of male fertility. Medical examinations made available pursuant to subsection (j)(3)(A)1. of this section shall include the following elements:

1. A detailed work history and a medical history, with particular attention to past lead exposure (occupational and nonoccupational), personal habits (smoking, hygiene), and past gastrointestinal, hematological, renal, cardiovascular, reproductive and neurological problems;

2. A thorough physical examination, with particular attention to teeth, gums, hematological, gastrointestinal, renal, cardiovascular, and

neurological systems. Pulmonary status should be evaluated if respiratory protection will be used;

3. A blood pressure measurement;

4. A blood sample and analysis which determines:

   a. Blood lead level;

   b. Hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology;

   c. Zinc protoporphyrin;

   d. Blood urea nitrogen; and,

   e. Serum creatinine;

5. A routine urinalysis with microscopic examination; and

6. Any laboratory or other test relevant to lead exposure which the examining physician deems necessary by sound medical practice.

(C) Multiple physician review mechanism.

1. If the employer selects the initial physician who conducts any medical examination or consultation provided to an employee under this section, the employee may designate a second physician:

   a. To review any findings, determinations or recommendations of the initial physician; and

   b. To conduct such examinations, consultations, and laboratory tests as the second physician deems necessary to facilitate this review.

2. The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician conducts a medical examination or consultation pursuant to this section. The employer may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the following within fifteen (15) days after receipt of the foregoing notification, or receipt of the initial physician's written opinion, whichever is later:

   a. The employee informing the employer that he or she intends to seek a second medical opinion, and

b. The employee initiating steps to make an appointment with a second physician.

3. If the findings, determinations or recommendations of the second physician differ from those of the initial physician, then the employer and the employee shall assure that efforts are made for the two physicians to resolve any disagreement.

4. If the two physicians have been unable to quickly resolve their disagreement, then the employer and the employee through their respective physicians shall designate a third physician:

a. To review any findings, determinations or recommendations of the prior physicians; and

b. To conduct such examinations, consultations, laboratory tests and discussions with the prior physicians as the third physician deems necessary to resolve the disagreement of the prior physicians.

5. The employer shall act consistent with the findings, determinations and recommendations of the third physician, unless the employer and the employee reach an agreement which is otherwise consistent with the recommendations of at least one of the three physicians.

(D) Information provided to examining and consulting physicians.

1. The employer shall provide an initial physician conducting a medical examination or consultation under this section with the following information:

a. A copy of this regulation for lead including all Appendices;

b. A description of the affected employee's duties as they relate to the employee's exposure;

c. The employee's exposure level or anticipated exposure level to lead and to any other toxic substance (if applicable);

d. A description of any personal protective equipment used or to be used;

e. Prior blood lead determinations; and

f. All prior written medical opinions concerning the employee in the employer's possession or control.

2. The employer shall provide the foregoing information to a second or third physician conducting a medical examination or consultation under this section upon request either by the second or third physician, or by the employee.

(E) Written medical opinions.

1. The employer shall obtain and furnish the employee with a copy of a written medical opinion from each examining or consulting physician which contains only the following information:

a. The physician's opinion as to whether the employee has any detected medical condition which would place the employee at increased risk of material impairment of the employee's health from exposure to lead;

b. Any recommended special protective measures to be provided to the employee, or limitations to be placed upon the employee's exposure to lead;

c. Any recommended limitation upon the employee's use of respirators, including a determination of whether the employee can wear a powered air purifying respirator if a physician determines that the employee cannot wear a negative pressure respirator; and

d. The results of the blood lead determinations.

2. The employer shall instruct each examining and consulting physician to:

a. Not reveal either in the written opinion or orally, or in any other means of communication with the employer, findings, including laboratory results, or diagnoses unrelated to an employee's occupational exposure to lead; and

b. Advise the employee of any medical condition, occupational or non-occupational, which dictates further medical examination or treatment.

(F) Alternate physician determination mechanisms. The employer and an employee or authorized employee representative may agree upon the use of any alternate physician determination mechanism in lieu of the multiple physician review mechanism provided by subsection (j)(3)(C) so long as the alternate mechanism is as expeditious and protective as the requirements contained in this subsection.

(4) Chelation.

(A) The employer shall assure that any person whom he retains, employs, supervises or controls does not engage in prophylactic chelation of any employee at any time.

(B) If therapeutic or diagnostic chelation is to be performed by any person in subsection (j)(4)(A), the employer shall assure that it be done under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring and that the employee is notified in writing prior to its occurrence.

(k) Medical removal protection.

(1) Temporary medical removal and return of an employee

(A) Temporary removal due to elevated blood lead level. The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above 50 μg/dl; and,

(B) Temporary removal due to a final medical determination.

1. The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a final medical determination results in a medical finding, determination, or opinion that the employee has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

2. For the purposes of this section, the phrase "final medical determination" means the written medical opinion on the employees health status by the examining physician or, where relevant, the outcome of the multiple physician review mechanism or alternate medical determination mechanism used pursuant to the medical surveillance provisions of this section.

3. Where a final medical determination results in any recommended special protective measures for an employee, or limitations on an employee's exposure to lead, the employer shall implement and act consistent with the recommendation.

(C) Return of the employee to former job status.

1. The employer shall return an employee to his or her former job status:

a. For an employee removed due to a blood lead level at or above 50 μg/dl when two consecutive blood sampling tests

indicate that the employee's blood lead level is at or below 40 μg/dl;

b. For an employee removed due to a final medical determination, when a subsequent final medical determination results in a medical finding, determination, or opinion that the employee no longer has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

2. For the purposes of this section, the requirement that an employer return an employee to his or her former job status is not intended to expand upon or restrict any rights an employee has or would have had, absent temporary medical removal, to a specific job classification or position under the terms of a collective bargaining agreement.

(D) Removal of other employee special protective measure or limitations. The employer shall remove any limitations placed on an employee or end any special protective measures provided to an employee pursuant to a final medical determination when a subsequent final medical determination indicates that the limitations or special protective measures are no longer necessary.

(E) Employer options pending a final medical determination. Where the multiple physician review mechanism, or alternate medical determination mechanism used pursuant to the medical surveillance provisions of this section, has not yet resulted in a final medical determination with respect to an employee, the employer shall act as follows:

1. Removal. The employer may remove the employee from exposure to lead, provide special protective measures to the employee, or place limitations upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status.

2. Return. The employer may return the employee to his or her former job status, end any special protective measures provided to the employee, and remove any limitations placed upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status, with two exceptions:

a. If the initial removal, special protection, or limitation of the employee resulted from a final medical determination which differed from the findings, determinations, or recommendations of the initial physician; or

b. If the employee has been on removal status for the preceding eighteen months due to an elevated blood lead level, then the employer shall await a final medical determination.

(2) Medical removal protection benefits.

(A) Provision of medical removal protection benefits. The employer shall provide an employee up to eighteen (18) months of medical removal protection benefits on each occasion that an employee is removed from exposure to lead or otherwise limited pursuant to this section.

(B) Definition of medical removal protection benefits. For the purposes of this section, the requirement that an employer provide medical removal protection benefits means that, as long as the job the employee was removed from continues, the employer shall maintain the total normal earnings, seniority and other employment rights and benefits of an employee, including the employee's right to his or her former job status as though the employee had not been medically removed from the employee's job or otherwise medically limited.

(C) Follow-up medical surveillance during the period of employee removal or limitation. During the period of time that an employee is medically removed from his or her job or otherwise medically limited, the employer may condition the provision of medical removal protection benefits upon the employee's participation in follow-up medical surveillance made available pursuant to this section.

(D) Workers' compensation claims. If a removed employee files a claim for workers' compensation payments for a lead-related disability, then the employer shall continue to provide medical removal protection benefits pending disposition of the claim. To the extent that an award is made to the employee for earnings lost during the period of removal, the employer's medical removal protection obligation shall be reduced by such amount. The employer shall receive no credit for workers' compensation payments received by the employee for treatment-related expenses.

(E) Other credits. The employer's obligation to provide medical removal protection benefits to a removed employee shall be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program, or receives income from employment with another employer made possible by virtue of the employee's removal.

(F) Voluntary removal or restriction of an employee. Where an employer, although not required by this section to do so, removes an employee from exposure to lead or otherwise places limitations on an employee due to the effects of lead exposure on the employee's medical condition, the

employer shall provide medical removal protection benefits to the employee equal to that required by subsection (k)(2)(A) and (B).

(I) Employee information, training and certification.

(1) General.

(A) The employer shall communicate information concerning lead hazards according to the requirements of the Hazard Communication Standard, section 5194, including but not limited to the requirements concerning warning signs and labels, material safety data sheets (MSDS), and employee information and training.

(B) For all employees who are subject to exposure to lead at or above the action level on any day or who are subject to exposure to lead compounds which may cause skin or eye irritation (e.g., lead arsenate, lead azide), the employer shall provide a training program in accordance with subsection (l)(2) and assure employee participation.

(C) The employer shall provide the training program as initial training prior to the time of job assignment or prior to the start up date for this requirement, whichever comes last.

(D) The employer shall also provide the training program at least annually for each employee who is subject to lead exposure at or above the action level on any day.

(E) Where the certification of employee and supervisor training is required as described in subsection (l)(3) the training shall be conducted by a training provider accredited by the California Department of Health Services in accordance with Title 17, California Code of Regulations, Division 1, Chapter 8.

(2) Training program. The employer shall assure that each employee is trained in the following:

(A) The content of this standard and its appendices;

(B) The specific nature of the operations which could result in exposure to lead above the action level;

(C) The purpose, proper selection, fitting, use, and limitations of respirators;

(D) The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant);

(E) The engineering controls and work practices associated with the employee's job assignment including training of employees to follow relevant good work practices described in Appendix B of this section;

(F) The contents of any compliance plan and the location of regulated areas in effect;

(G) Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician; and

(H) The employee's right of access to records under section 3204.

(3) Certification of training for residential and public buildings.

The employer shall ensure that all employees and supervisors who are engaged in lead related construction work as defined in Title 17, California Code of Regulations, Section 35022, and have been shown to be exposed to lead at or above the permissible exposure limit meet the training requirements of this section, are trained by an accredited training provider and are certified by the California Department of Health Services. Lead related construction work is defined in Title 17 to be any construction, alteration, painting, demolition, salvage, renovation, repair, or maintenance of any residential or public building, including preparation and cleanup, that, by using or disturbing lead containing material or soil, may result in significant exposure of adults or children to lead. As used in the definition of lead related construction work, "public building" means a structure which is generally accessible to the public, including but not limited to, schools, daycare centers, museums, airports, hospitals, stores, convention centers, government facilities, office buildings and any other building which is not an industrial building or a residential building. Regulations for accreditation of training providers and for the certification of employees and supervisors are found in Title 17, California Code of Regulations, Division 1, Chapter 8.

(4) Access to information, training and certification materials.

(A) The employer shall make readily available to all affected employees a copy of this standard and its appendices.

(B) The employer shall provide, upon request, all materials relating to the employee information training program and certification to affected employees, their designated representatives, and to the Chief, and NIOSH.

(m) Signs.

(1) General.

(A) The employer may use signs required by other statutes, regulations or ordinances in addition to, or in combination with, signs required by this subsection.

(B) The employer shall assure that no statement appears on or near any sign required by this subsection which contradicts or detracts from the meaning of the required sign.

(2) Signs.

(A) The employer shall post the following warning signs in each regulated area or work area where an employees exposure to lead is above the PEL.

WARNING
LEAD WORK AREA POISON
NO SMOKING OR EATING

(B) The employer shall assure that signs required by this subsection are illuminated and cleaned

(n) Record keeping.

(1) Exposure assessment.

(A) The employer shall establish and maintain an accurate record of all monitoring and other data used in conducting employee exposure assessments as required in subsection (d).

(B) Exposure monitoring records shall include:

1. The date(s), number, duration, location and results of each of the samples taken if any, including a description of the sampling procedure used to determine representative employee exposure where applicable;

2. A description of the sampling and analytical methods used and evidence of their accuracy;

3, The type of respiratory protective devices worn, if any;

4. Name, social security number, and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent; and

5. The environmental variables that could affect the measurement of employee exposure.

(C) The employer shall maintain monitoring and other exposure assessment records in accordance with the provisions of section 3204.

(2) Medical surveillance.

(A) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by subsection (j).

(B) This record shall include:

1. The name, social security number, and description of the duties of the employee;

2. A copy of the physician's written opinions;

3. Results of any airborne exposure monitoring done on or for that employee and provided to the physician; and

4. Any employee medical complaints related to exposure to lead.

(C) The employer shall keep, or assure that the examining physician keeps, the following medical records:

1. A copy of the medical examination results including medical and work history required under subsection (j);

2. A description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information;

3. A copy of the results of biological monitoring.

(D) The employer shall maintain or assure that the physician maintains medical records in accordance with the provisions of section 3204.

(3) Medical removals.

(A) The employer shall establish and maintain an accurate record for each employee removed from current exposure to lead pursuant to subsection (k).

(B) Each record shall include:

1. The name and social security number of the employee;

2. The date of each occasion that the employee was removed from current exposure to lead as well as the corresponding date on which the employee was returned to his or her former job status;

3. A brief explanation of how each removal was or is being accomplished; and

4. A statement with respect to each removal indicating whether or not the reason for the removal was an elevated blood lead level.

(C) The employer shall maintain each medical removal record for at least the duration of an employee's employment.

(4) Objective data for exemption from requirement for initial monitoring.

(A) For purposes of this section, objective data are information demonstrating that a particular product or material containing lead or a specific process, operation, or activity involving lead cannot release dust or fumes in concentrations at or above the action level under any expected conditions of use. Objective data can be obtained from an industry-wide study or from laboratory product test results from manufacturers of lead containing products or materials, such as surface coating materials. The data the employer uses from an industry-wide survey must be obtained under workplace conditions closely resembling the processes, types of material, control methods, work practices and environmental conditions in the employer's current operations.

(B) The employer shall maintain the record of the objective data relied upon for at least 30 years.

(5) Availability. The employer shall make available upon request all records required to be maintained by subsection (n) to affected employees, former employees, and their designated representatives, and to the Chief and NIOSH for examination and copying.

(6) Transfer of records.

(A) Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by subsection (n).

(B) Whenever the employer ceases to do business and there is no successor employer to receive and retain the records required to be maintained by this section for the prescribed period, these records shall be transmitted to NIOSH.

(C) At the expiration of the retention period for the records required to be maintained by this section, the employer shall notify NIOSH at least 3 months prior to the disposal of such records and shall transmit those records to NIOSH if requested within the period.

(D) The employer shall also comply with any additional requirements involving transfer of records set forth in section 3204(h).

(o) Observation of monitoring.

(1) Employee observation. The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to lead conducted pursuant to subsection (d).

(2) Observation procedures.

(A) Whenever observation of the monitoring of employee exposure to lead requires entry into an area where the use of respirators, protective clothing or equipment is required, the employer shall provide the observer with and assure the use of such respirators, clothing and equipment, and shall require the observer to comply with all other applicable safety and health procedures.

(B) Without interfering with the monitoring, observers shall be entitled to:

1. Receive an explanation of the measurement procedures;

2. Observe all steps related to the monitoring of lead performed at the place of exposure; and

3. Record the results obtained or receive copies of the results when returned by the laboratory.

(p) Effective date.

This standard shall become effective immediately on filing with the Secretary of State.

(q) Appendices.

The information contained in the appendices to this section is not intended, by itself, to create any additional obligations not otherwise imposed by this standard nor detract from any existing obligation.

TABLE 1.-RESPIRATORY PROTECTION FOR LEAD AEROSOLS

Airborne concentration of lead or condition of use	Required respirator (1)
Not in excess of 500 $\mu g/m^3$	• 1/2 mask air purifying respirator with high efficiency filters.(2,3)
	• 1/2 mask supplied air respirator operated in demand (negative pressure) mode.
Not in excess of 1,250 $\mu g/m^3$	• Loose fitting hood or helmet powered air purifying respirator with high efficiency filters. (3)
	• Hood or helmet supplied air respirator operated in a continuous flow mode; e.g., type CE abrasive blasting respirator operated in a continuous-flow mode.
Not in excess of 2,500 $\mu g/m^3$	Full facepiece air purifying respirator with high efficiency filters. (3)
	• Tight fitting powered air purifying respirator with high efficiency filters. (3)
	• Full facepiece supplied air respirator operated in demand mode.
	• 1/2 mask or full facepiece supplied air respirator operated in a continuous-flow mode.
	• Full facepiece self- contained breathing apparatus (SCBA) operated in demand mode.
Not in excess of 50,000 $\mu g/m^3$	• 1/2 mask supplied air respirator operated in pressure demand or other positive-pressure mode.
Not in excess of100,000 $\mu g/m^3$	• Full facepiece supplied air respirator operated in pressure demand or other positive-pressure mode; e.g., type CE abrasive blasting respirators operated in a positive-pressure mode.
Greater than 100,000 $\mu g/m^3$, unknown concentration, or fire fighting	• Full facepiece SCBA operated in pressure demand or other positive-pressure mode.

Notes:

(1) Respirators specified for higher concentrations can be used at lower concentrations of lead.

(2) Full facepiece is required if the lead aerosols cause eye or skin irritation at the use concentrations.

(3) A high efficiency particulate filter (HEPA) means a filter that is 99.97 percent efficient against particles of 0.3 micron size or larger.

Cal/OSHA Construction Safety Orders, Lead Section 1532.1

Title 8 California Code of Regulations
APPENDIX A
Substance Data sheet for Occupational Exposure to Lead

I. Substance Identification

A. Substance: Pure lead (Pb) is a heavy metal at room temperature and pressure and is a basic chemical element. It can combine with various other substances to form numerous lead compounds.

B. Compounds covered by the standard: The word 'lead' when used in this interim final standard means elemental lead, all inorganic lead compounds and a class of organic lead compounds called lead soaps. This standard does not apply to other organic lead compounds.

C. Uses: Exposure to lead occurs in several different occupations in the construction industry, including demolition or salvage of structures where lead or lead-containing materials are present; removal or encapsulation of lead-containing materials, new construction, alteration, repair, or renovation of structures that contain lead or materials containing lead; installation of products containing lead. In addition, there are construction-related activities where exposure to lead may occur, including transportation, disposal, storage, or containment of lead or materials containing lead on construction sites, and maintenance operations associated with construction activities.

D. Permissible exposure: The permissible exposure limit (PEL) set by the standard is 50 micrograms of lead per cubic meter of air (50 $\mu g/m^3$), averaged over an 8-hour workday.

E. Action level: The interim final standard establishes an action level of 30 micrograms of lead per cubic meter of air (30 $\mu g/m^3$), averaged over an 8-hour workday. The action level triggers several ancillary provisions of the standard such as exposure monitoring, medical surveillance, and training.

II. Health Hazard Data

A. Ways in which lead enters your body. When absorbed into your body in certain doses, lead is a toxic substance. The object of the lead standard is to prevent absorption of harmful quantities of lead. The standard is intended to protect you not only from the immediate toxic effects of lead, but also from the serious toxic effects that may not become apparent until years of exposure have passed. Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin. When lead is scattered in the air as a dust, fume respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed.

If you handle food, cigarettes, chewing tobacco, or make-up which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion. A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood stream, lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole body systems.

B. Effects of overexposure to lead

(1) short term (acute) overexposure. Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardiorespiratory arrest. A short term dose of lead can lead to acute encephalopathy. Short term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

(2) Long-term (chronic) overexposure. Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain. Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic “wrist drop” or “foot drop” and is a manifestation of a disease to the nervous system called peripheral neuropathy. Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds

of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible. Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood. Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigability as a result of decreased oxygen carrying capacity in the blood.

(3) Health protection goals of the standard. Prevention of adverse health effects for most workers from exposure to lead throughout a working lifetime requires that a worker's blood lead level (BLL, also expressed as PbB) be maintained at or below forty micrograms per deciliter of whole blood (40 μg/dl). The blood lead levels of workers (both male and female workers) who intend to have children should be maintained below 30 μg/dl to minimize adverse reproductive health effects to the parents and to the developing fetus. The measurement of your blood lead level (BLL) is the most useful indicator of the amount of lead being absorbed by your body. Blood lead levels are most often reported in units of milligrams (mg) or micrograms (μg) of lead (1 mg = 1,000 mg) per 100 grams (100 g), 100 milliliters (100 ml) or deciliter (dl) of blood. These three units are essentially the same. Sometimes BLLs are expressed in the form of mg% or mg%. This is a shorthand notation for 100 g, 100 ml, or dl. (References to BLL measurements in this standard are expressed in the form of μg/dl.)

BLL measurements show the amount of lead circulating in your blood stream, but do not give any information about the amount of lead stored in your various tissues. BLL measurements merely show current absorption of lead, not the effect that lead is having on your body or the effects that past lead exposure may have already caused. Past research into lead-related diseases, however, has focused heavily on associations between BLLs and various diseases. As a result, your BLL is an important indicator of the likelihood that you will gradually acquire a lead related health impairment or disease.

Once your blood lead level climbs above 40 μg/dl, your risk of disease increases. There is a wide variability of individual response to lead, thus it is difficult to say that a particular BLL in a given person will cause a

particular effect. Studies have associated fatal encephalopathy with BLLs as low as 150 μg/dl. Other studies have shown other forms of diseases in some workers with BLLs well below 80 μg/dl. Your BLL is a crucial indicator of the risks to your health, but one other factor is also extremely important. This factor is the length of time you have had elevated BLLs. The longer you have an elevated BLL, the greater the risk that large quantities of lead are being gradually stored in your organs and tissues (body burden). The greater your overall body burden, the greater the chances of substantial permanent damage. The best way to prevent all forms of lead-related impairments and diseases-both short term and long term-is to maintain your BLL below 40 μg/dl. The provisions of the standard are designed with this end in mind.

Your employer has prime responsibility to assure that the provisions of the standard are complied with both by the company and by individual workers. You, as a worker, however, also have a responsibility to assist your employer in complying with the standard. You can play a key role in protecting your own health by learning about the lead hazards and their control, learning what the standard requires, following the standard where it governs your own actions, and seeing that your employer complies with provisions governing his or her actions.

(4) Reporting signs and symptoms of health problems. You should immediately notify your employer if you develop signs or symptoms associated with lead poisoning or if you desire medical advice concerning the effects of current or past exposure to lead or your ability to have a healthy child. You should also notify your employer if you have difficulty breathing during a respirator fit test or while wearing a respirator. In each of these cases, your employer must make available to you appropriate medical examinations or consultations These must be provided at no cost to you and at a reasonable time and place. The standard contains a procedure whereby you can obtain a second opinion by a physician of your choice if your employer selected the initial physician.

Title 8 California Code of Regulations
APPENDIX B
Employee Standard Summary

This appendix summarizes key provisions of the standard for lead in construction that you as a worker should become familiar with.

I. Permissible Exposure Limit (PEL)-subsection (C)

The standard sets a permissible exposure limit (PEL) of 50 micrograms of lead per cubic meter of air (50 $\mu g/m^3$), averaged over an 8-hour workday which is referred to as a time-weighted average (TWA). This is the highest level of lead in air to which you may be permissibly exposed over an 8-hour workday. However, since this is an 8-hour average, short exposures above the PEL are permitted so long as for each 8-hour work day your average exposure does not exceed this level. This standard, however, takes into account the fact that your daily exposure to lead can extend beyond a typical 8-hour workday as the result of overtime or other alterations in your work schedule. To deal with this situation, the standard contains a formula which reduces your permissible exposure when you are exposed more than 8 hours. For example, if you are exposed to lead for 10 hours a day, the maximum permitted average exposure would be 40 $\mu g/m^3$.

II. Exposure Assessment-subsection (d)

If lead is present in your workplace in any quantity, your employer is required to make an initial determination of whether any employee's exposure to lead exceeds the action level (30 $\mu g/m^3$ averaged over an 8-hour day). Employee exposure is that exposure which would occur if the employee were not using a respirator. This initial determination requires your employer to monitor workers' exposures unless he or she has objective data which can demonstrate conclusively that no employee will be exposed to lead in excess of the action level. Where objective data is used in lieu of actual monitoring the employer must establish and maintain an accurate record, documenting its relevancy in assessing exposure levels for current job conditions. If such objective data is available, the employer need proceed no further on employee exposure assessment until such time that conditions have changed and the determination is no longer valid.

Objective data for surfaces and materials that is less than 0.06% lead dry weight (600 ppm) is indicative of materials that will not give lead concentrations above the action level. Lead analysis must be performed for each unique surface coating or material. Surface coating or material objective data cannot be used to replace air monitoring for exposure assessments required for the lead-related tasks listed in subsection (d)(2).

Objective data may be compiled from various sources; e.g., insurance companies and trade associations and information from suppliers or exposure data collected from similar operations. Objective data may also comprise previously collected sampling data including area monitoring. If it cannot be determined through using objective data that worker exposure is less than the action level, your employer must conduct monitoring or must rely on relevant previous personal sampling, if available. Where monitoring is required for the initial determination, it may be limited to a representative number of employees who are reasonably expected to have the highest exposure levels. If your

employer has conducted appropriate air sampling for lead in the past 12 months, he or she may use these results, provided they are applicable to the same employee tasks and exposure conditions and meet the requirements for accuracy as specified in the standard. As with objective data, if such results are relied upon for the initial determination, your employer must establish and maintain a record as to the relevancy of such data to current job conditions.

If there have been any employee complaints of symptoms which may be attributable to exposure to lead or if there is any other information or observations which would indicate employee exposure to lead, this must also be considered as part of the initial determination.

If this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirators, over the action level, your employer must set up an air monitoring program to determine the exposure level representative of each employee exposed to lead at your workplace. In carrying out this air monitoring program, your employer is not required to monitor the exposure of every employee, but he or she must monitor a representative number of employees and job types. Enough sampling must be done to enable each employee's exposure level to be reasonably represent full shift exposure. In addition, these air samples must be taken under conditions which represent each employee's regular, daily exposure to lead. Sampling performed in the past 12 months may be used to determine exposures above the action level if such sampling was conducted during work activities essentially similar to present work conditions.
The standard lists certain tasks which may likely result in exposures to lead in excess of the PEL and, in some cases, exposures in excess of 50 times the PEL. If you are performing any of these tasks, your employer must provide you with appropriate respiratory protection, protective clothing and equipment, change areas, hand washing facilities, biological monitoring, and training until such time that an exposure assessment is conducted which demonstrates that your exposure level is below the PEL. Objective data cannot be used to replace air monitoring for this exposure assessment.

If you are exposed to lead and air sampling is performed, your employer is required to notify you in writing within 5 working days of the air monitoring results which represent your exposure. If the results indicate that your exposure exceeds the PEL (without regard to your use of a respirator), then your employer must also notify you of this in writing, and provide you with a description of the corrective action that has been taken or will be taken to reduce your exposure.

Your exposure must be rechecked by monitoring, at least every six months if your exposure is at or over the action level but below the PEL. Your employer may discontinue monitoring for you if 2 consecutive measurements, taken at least 7 days apart, are at or below the action level. Air monitoring must be repeated every 3 months if you are exposed over the PEL. Your employer must continue monitoring for you at this frequency until 2 consecutive measurements, taken at least 7 days apart, are below the PEL but above the action level, at which time your employer must repeat monitoring of your exposure every six months and may discontinue monitoring only after your exposure drops to or below the action level. However, whenever there is a change of equipment, process, control, or personnel or a new type of job is added at your workplace

which may result in new or additional exposure to lead, your employer must perform additional monitoring.

III. Methods of Compliance-subsection (e)

Your employer is required to assure that no employee is exposed to lead in excess of the PEL as an 8-hour TWA. The standard for lead in construction requires employers to institute engineering and work practice controls including administrative controls to the extent feasible to reduce employee exposure to lead. Where such controls are feasible but not adequate to reduce exposures below the PEL they must be used nonetheless to reduce exposures to the lowest level that can be accomplished by these means and then supplemented with appropriate respiratory protection. Your employer must establish a regulated area that includes the work area where airborne exposure to lead is above the PEL. or where the lead-related tasks listed in subsection (d)(2) are performed.

Your employer is required to develop and implement a written compliance program prior to the commencement of any job where employee exposures may reach the PEL as an 8-hour TWA. The standard identifies the various elements that must be included in the plan. For example, employers are required to include a description of operations in which lead is emitted, detailing other relevant information about the operation such as the type of equipment used, the type of material involved, employee job responsibilities, operating procedures and maintenance practices. In addition, your employer's compliance plan must specify the means that will be used to achieve compliance and, where engineering controls are required, include any engineering plans or studies that have been used to select the control methods. If administrative controls involving job rotation are used to reduce employee exposure to lead, the job rotation schedule must be included in the compliance plan. The plan must also detail the type of protective clothing and equipment, including respirators, housekeeping and hygiene practices that will be used to protect you from the adverse effects of exposure to lead.

The written compliance program must be made available, upon request, to affected employees and their designated representatives, the Chief and NIOSH.

Finally, the plan must be reviewed and updated at least every 6 months to assure it reflects the current status in exposure control.

IV. Respiratory Protection-subsection (f)

Your employer is required to provide and assure your use of respirators when your exposure to lead is not controlled below the PEL by other means. The employer must pay the cost of the respirator. Whenever you request one, your employer is also required to provide you a respirator even if your air exposure level is not above the PEL. You might desire a respirator when, for example, you have received medical advice that your lead absorption should be decreased. Or, you may intend to have children in the near future, and want to reduce the level of lead in your body to minimize adverse reproductive effects. While respirators are the least satisfactory means of controlling your exposure, they are capable of providing significant protection if properly chosen, fitted, worn, cleaned, maintained, and replaced when they stop providing adequate protection.

Your employer is required to select respirators from the types listed in Table I of the Respiratory Protection section of the standard (section 1532.1(f)). Any respirator chosen must be approved by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 42 CFR part 84. This respirator selection table will enable your employer to choose a type of respirator which will give you a proper amount of protection based on your airborne lead exposure. Your employer may select a type of respirator that provides greater protection than that required by the standard; that is, one recommended for a higher concentration of lead than is present in your workplace. For example, a powered air purifying respirator (PAPR) is much more protective than a typical negative pressure respirator, and may also be more comfortable to wear. A PAPR has a filter, cartridge or canister to clean the air, and a power source which continuously blows filtered air into your breathing zone. Your employer might make a PAPR available to you to ease the burden of having to wear a respirator for long periods of time. The standard provides that you can obtain a PAPR upon request.

Your employer must assure that your respirator facepiece fits properly. Proper fit of a respirator facepiece is critical. Obtaining a proper fit on each employee may require your employer to make available two or three different mask types. In order to assure that your respirator fits properly and that facepiece leakage is minimized, your employer must give you either a qualitative fit test or a quantitative fit test as specified in Appendix A of the Respiratory Protection standard located at section 5144.

You must also receive from your employer proper training in the use of respirators. Your employer is required to teach you how to wear a respirator, to know why it is needed, and to understand its limitations.

The standard provides that if your respirator uses filter elements, you must be given an opportunity to change the filter elements whenever an increase in breathing resistance is detected. You also must be permitted to periodically leave your work area to wash your face and respirator facepiece whenever necessary to prevent skin irritation. If you ever have difficulty in breathing during a fit test or while using a respirator, your employer must make a medical examination available to you to determine whether you can safely wear a respirator. The result of this examination may be to give you a positive pressure respirator (which reduces breathing resistance) or to provide alternative means of protection.

V. Protective Work Clothing and Equipment-subsection (g)

If you are exposed to lead above the PEL as an 8-hour TWA, without regard to your use of a respirator, or if you are exposed to lead compounds such as lead arsenate or lead azide which can cause skin and eye irritation, your employer must provide you with protective work clothing and equipment appropriate for the hazard. If work clothing is provided, it must be provided in a clean and dry condition at least weekly, and daily if your airborne exposure to lead is greater than 200 $\mu g/m^3$. Appropriate protective work clothing and equipment can include coveralls or similar full-body work clothing, gloves, hats, shoes or disposable shoe coverlets, and face shields or vented goggles. Your employer is required to provide all such equipment at no cost to you. In addition, your employer is responsible for providing repairs and replacement as necessary, and also is responsible for the cleaning, laundering or disposal of protective clothing and equipment.

The standard requires that your employer assure that you follow good work practices when you are working in areas where your exposure to lead may exceed the PEL. With respect to protective clothing and equipment, where appropriate, the following procedures should be observed prior to beginning work:

1. Change into work clothing and shoe covers m the clean section of the designated changing areas;
2. Use work garments of appropriate protective gear, including respirators before entering the work area; and
3. Store any clothing not worn under protective clothing in the designated changing area.

Workers should follow these procedures upon leaving the work area:

1. HEPA vacuum heavily contaminated protective work clothing while it is still being worn. At no time may lead be removed from protective clothing by any means which result in uncontrolled dispersal of lead into the air;
2. Remove shoe covers and leave them in the work area;
3. Remove protective clothing and gear in the dirty area of the designated changing area. Remove protective coveralls by carefully rolling down the garment to reduce exposure to dust.
4. Remove respirators last; and
5. Wash hands and face.

Workers should follow these procedures upon finishing work for the day (in addition to procedures described above):

1. Where applicable, place disposal coveralls and shoe covers with the abatement waste;
2. Contaminated clothing which is to be cleaned, laundered or disposed of must be placed in closed containers in the change room.
3. Clean protective gear, including respirators, according to standard procedures;
4. Wash hands and face again. If showers are available, take a shower and wash hair. If shower facilities are not available at the work site, shower immediately at home and wash hair.

VI. Housekeeping-subsection (h)

Your employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. Vacuuming is the preferred method of meeting this requirement, and the use of compressed air to clean floors and other surfaces is generally prohibited unless removal with compressed air is done in conjunction with ventilation systems designed to contain dispersal of the lead dust. Dry or wet sweeping, shoveling, or brushing may not be used except where vacuuming or other equally effective methods have been tried and do not work. Vacuums must be used equipped with a special filter called a high-efficiency particulate air (HEPA) filter and emptied in a manner which minimizes the reentry of lead into the workplace.

VII. Hygiene Facilities, Practices and Regulated Areas-subsection (I)

The standard requires that hand washing facilities be provided where occupational exposure to lead occurs. In addition, change areas, showers (where feasible), and lunchrooms or eating areas
are to be made available to workers exposed to lead above the PEL. Your employer must assure that except in these facilities, food and beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, where airborne exposures are above the PEL. Change rooms provided by your employer must be equipped with separate storage facilities for your protective clothing and equipment and street clothes to avoid cross-contamination. After showering, no required protective clothing or equipment worn during the shift may be worn home. It is important that contaminated clothing or equipment be removed in change areas and not be worn home or you will extend your exposure and expose your family since lead from your clothing can accumulate in your house, car, etc.

Lunchrooms or eating areas may not be entered with protective clothing or equipment unless surface dust has been removed by vacuuming, downdraft booth, or other cleaning method. Finally, workers exposed above the PEL must wash both their hands and faces prior to eating, drinking, smoking or applying cosmetics.

All of the facilities and hygiene practices just discussed are essential to minimize additional sources of lead absorption from inhalation or ingestion of lead that may accumulate on you, your clothes, or your possessions. Therefore, employers shall establish regulated areas, where access is controlled by the supervisor for work areas where employees are exposed to lead at or above the PEL or performing the specific tasks that require air monitoring, as required bv subsection (d)(2). Any employee that enters the regulated area must be provided with protective equipment. Strict compliance with these provisions can virtually eliminate several sources of lead exposure which significantly contribute to excessive lead absorption.

VIII. Medical Surveillance-subsection (j)

The medical surveillance program is part of the standard's comprehensive approach to the prevention of lead-related disease. Its purpose is to supplement the main thrust of the standard which is aimed at minimizing airborne concentrations of lead and sources of ingestion. Only medical surveillance can determine if the other provisions of the standard have effectively protected you as an individual. Compliance with the standard's provision will protect most workers from the adverse effects of lead exposure, but may not be satisfactory to protect individual workers who:

1. have high body burdens of lead acquired over past years,
2. have additional uncontrolled sources of non-occupational lead exposure,
3. exhibit unusual variations in lead absorption rates, or
4. have specific non-work related medical conditions which could be aggravated by lead exposure (e.g., renal disease, anemia).

In addition, control systems may fail, or hygiene and respirator programs may be inadequate. Periodic medical surveillance of individual workers will help detect those failures. Medical surveillance will also be important to protect your reproductive ability-regardless of whether you are a man or woman.

All medical surveillance required by the interim final standard must be performed by or under the supervision of a licensed physician. The employer must provide required medical surveillance without cost to employees and at a reasonable time and place. The standard's medical surveillance program has two parts-periodic biological monitoring and medical examinations. Your employer's obligation to offer you medical surveillance is triggered by the results of the air monitoring program. Full medical surveillance must be made available to all employees who are or may be exposed to lead in excess of the action level for more than 30 days a year and whose blood lead level exceeds 40 μg/dl. Initial medical surveillance consisting of blood sampling and analysis for lead and zinc protoporphyrin must be provided to all employees exposed at any time (1 day) above the action level.

Biological monitoring under the standard must be provided at least every 2 months for the first 6 months and every 6 months thereafter until your blood lead level is below 40 μg/dl. A zinc protoporphyrin (ZPP) test is a very useful blood test which measures an adverse metabolic effect of lead on your body and is therefore an indicator of lead toxicity.

If your BLL exceeds 40 μg/dl the monitoring frequency must be increased from every 6 months to at least every 2 months and not reduced until two consecutive BLLs indicate a blood lead level below 40 μg/dl. Each time your BLL is determined to be over 40 μg/dl, your employer must notify you of this in writing within five working days of his or her receipt of the test results. The employer must also inform you that the standard requires temporary medical removal with economic protection when your BLL exceeds 50 μg/dl. (See Discussion of Medical Removal Protection-subsection (k).) Anytime your BLL exceeds 50 μg/dl your employer must make available to you within two weeks of receipt of these test results a second follow-up BLL test to confirm your BLL. If the two tests both exceed 50 μg/dl, and you are temporarily removed, then your employer must make successive BLL tests available to you on a monthly basis during the period of your removal.

Medical examinations beyond the initial one must be made available on an annual basis if your blood lead level exceeds 40 μg/dl at any time during the preceding year and you are being exposed above the airborne action level of 30 $\mu g/m^3$ for 30 or more days per year. The initial examination will provide information to establish a baseline to which subsequent data can be compared.

An initial medical examination to consist of blood sampling and analysis for lead and zinc protoporphyrin must also be made available (prior to assignment) for each employee being assigned for the first time to an area where the airborne concentration of lead equals or exceeds the action level at any time. In addition, a medical examination or consultation must be made available as soon as possible if you notify your employer that you are experiencing signs or symptoms commonly associated with lead poisoning or that you have difficulty breathing while wearing a respirator or during a respirator fit test.

You must also be provided a medical examination or consultation if you notify your employer that you desire medical advice concerning the effects of current or past exposure to lead on your ability to procreate a healthy child.

Finally, appropriate follow-up medical examinations or consultations may also be provided for employees who have been temporarily removed from exposure under the medical removal protection provisions of the standard. (See Part IX, below.)

The standard specifies the minimum content of pre-assignment and annual medical examinations. The content of other types of medical examinations and consultations is left up to the sound discretion of the examining physician. Pre-assignment and annual medical examinations must include:

1. a detailed work history and medical history;
2. a thorough physical examination, including an evaluation of your pulmonary status if you will be required to use a respirator;
3. a blood pressure measurement; and
4. a series of laboratory tests designed to check your blood chemistry and your kidney function. In addition, at any time upon your request, a laboratory evaluation of male fertility will be made (microscopic examination of a sperm sample), or a pregnancy test will be given.

The standard does not require that you participate in any of the medical procedures, tests, etc., which your employer is required to make available to you. Medical surveillance can, however, play a very important role in protecting your health. You are strongly encouraged, therefore, to participate in a meaningful fashion. The standard contains a multiple physician review mechanism which will give you a chance to have a physician of your choice directly participate in the medical surveillance program. If you are dissatisfied with an examination by a physician chosen by your employer, you can select a second physician to conduct an independent analysis. The two doctors would attempt to resolve any differences of opinion, and select a third physician to resolve any firm dispute. Generally your employer will choose the physician who conducts medical surveillance under the lead standard-unless you and your employer can agree on the choice of a physician or physicians. Some companies and unions have agreed in advance, for example, to use certain independent medical laboratories or panels of physicians. Any of these arrangements are acceptable so long as required medical surveillance is made available to workers.

The standard requires your employer to provide certain information to a physician to aid in his or her examination of you. This information includes:

1. the standard and its appendices,
2. a description of your duties as they relate to occupational lead exposure,
3. your exposure level or anticipated exposure level,
4. a description of any personal protective equipment you wear,
5. prior blood lead level results, and
6. prior written medical opinions concerning you that the employer has.

After a medical examination or consultation the physician must prepare a written report which must contain:

1. the physician's opinion as to whether you have any medical condition which places you at increased risk of material impairment to health from exposure to lead,
2. any recommended special protective measures to be provided to you,
3. any blood lead level determinations, and
4. any recommended limitation on your use of respirators. This last element must include a determination of whether you can wear a powered air purifying respirator (PAPR) if you are found unable to wear a negative pressure respirator.

The medical surveillance program of the interim lead standard may at some point in time serve to notify certain workers that they have acquired a disease or other adverse medical condition as a result of occupational lead exposure. If this is true, these workers might have legal rights to compensation from public agencies, their employers, firms that supply hazardous products to their employers, or other persons. Some states have laws, including worker compensation laws, that disallow a worker who learns of a job-related health impairment to sue, unless the worker sues within a short period of time after learning of the impairment. (This period of time may be a matter of months or years.) An attorney can be consulted about these possibilities. It should be stressed that OSHA is in no way trying to either encourage or discourage claims or lawsuits. However, since results of the standard's medical surveillance program can significantly affect the legal remedies of a worker who has acquired a job-related disease or impairment, it is proper for OSHA to make you aware of this.

The medical surveillance section of the standard also contains provisions dealing with chelation. Chelation is the use of certain drugs (administered in pill form or injected into the body) to reduce the amount of lead absorbed in body tissues. Experience accumulated by the medical and scientific communities has largely confirmed the effectiveness of this type of therapy for the treatment of very severe lead poisoning. On the other hand, it has also been established that there can be a long list of extremely harmful side effects associated with the use of chelating agents. The medical community has balanced the advantages and disadvantages resulting from the use of chelating agents in various circumstances and has established when the use of these agents is acceptable. The standard includes these accepted limitations due to a history of abuse of chelation therapy by some lead companies. The most widely used chelating agents are calcium disodium EDTA, ($CaNa_2EDTA$), Calcium Disodium Versenate (Versenate), and d-penicillamine (penicillamine or Cupramine).

The standard prohibits "prophylactic chelation" of any employee by any person the employer retains, supervises or controls. "Prophylactic chelation" is the routine use of chelating or similarly acting drugs to prevent elevated blood levels in workers who are occupationally exposed to lead, or the use of these drugs to routinely lower blood lead levels to pre-designated concentrations believed to be "safe." It should be emphasized that where an employer takes a worker who has no symptoms of lead poisoning and has chelation carried out by a physician (either inside or outside of a hospital) solely to reduce the worker's blood lead level, that will generally be considered prophylactic

chelation. The use of a hospital and a physician does not mean that prophylactic chelation is not being performed. Routine chelation to prevent increased or reduce current blood lead levels is unacceptable whatever the setting.

The standard allows the use of "therapeutic" or "diagnostic" chelation if administered under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring. Therapeutic chelation responds to severe lead poisoning where there are marked symptoms. Diagnostic chelation involved giving a patient a dose of the drug then collecting all urine excreted for some period of time as an aid to the diagnosis of lead poisoning.

In cases where the examining physician determines that chelation is appropriate, you must be notified in writing of this fact before such treatment. This will inform you of a potentially harmful treatment, and allow you to obtain a second opinion.

IX. Medical Removal Protection-subsection (k)

Excessive lead absorption subjects you to increased risk of disease. Medical removal protection (MRP) is a means of protecting you when, for whatever reasons, other methods, such as engineering controls, work practices, and respirators, have failed to provide the protection you need. MRP involves the temporary removal of a worker from his or her regular job to a place of significantly lower exposure without any loss of earnings, seniority, or other employment rights or benefits. The purpose of this program is to cease further lead absorption and allow your body to naturally excrete lead which has previously been absorbed. Temporary medical removal can result from an elevated blood lead level, or a medical opinion. For up to 18 months, or for as long as the job the employee was removed from lasts, protection is provided as a result of either form of removal. The vast majority of removed workers, however, will return to their former jobs long before this eighteen month period expires.

You may also be removed from exposure even if your blood lead level is below 50 μg/dl if a final medical determination indicates that you temporarily need reduced lead exposure for medical reasons. If the physician who is implementing your employer's medical program makes a final written opinion recommending your removal or other special protective measures, your employer must implement the physician's recommendation. If you are removed in this manner, you may only be returned when the doctor indicates that it is safe for you to do so.

The standard does not give specific instructions dealing with what an employer must do with a removed worker. Your job assignment upon removal is a matter for you, your employer and your union (if any) to work out consistent with existing procedures for job assignments. Each removal must be accomplished in a manner consistent with existing collective bargaining relationships. Your employer is given broad discretion to implement temporary removals so long as no attempt is made to override existing agreements. Similarly, a removed worker is provided no right to veto an employer's choice which satisfies the standard.

In most cases, employers will likely transfer removed employees to other jobs with sufficiently low lead exposure. Alternatively, a worker's hours may be reduced so that

the time weighted average exposure is reduced, or he or she may be temporarily laid off if no other alternative is feasible.

In all of these situations, MRP benefits must be provided during the period of removal; i.e., you continue to receive the same earnings, seniority, and other rights and benefits you would have had if you had not been removed. Earnings includes more than just your base wage; it includes overtime, shift differentials, incentives, and other compensation you would have earned if you had not been removed. During the period of removal you must also be provided with appropriate follow-up medical surveillance. If you were removed because your blood lead level was too high, you must be provided with a monthly blood test. If a medical opinion caused your removal, you must be provided medical tests or examinations that the doctor believes to be appropriate. If you do not participate in this follow-up medical surveillance, you may lose your eligibility for MRP benefits.

When you are medically eligible to return to your former job, your employer must return you to your "former job status." This means that you are entitled to the position, wages, benefits, etc., you would have had if you had not been removed. If you would still be in your old job if no removal had occurred that is where you go back. If not, you are returned consistent with whatever job assignment discretion your employer would have had if no removal had occurred. MRP only seeks to maintain your rights, not expand them or diminish them.

If you are removed under MRP and you are also eligible for worker compensation or other compensation for lost wages, your employer's MRP benefits obligation is reduced by the amount that you actually receive from these other sources. This is also true if you obtain other employment during the time you are laid off with MRP benefits.

The standard also covers situations where an employer voluntarily removes a worker from exposure to lead due to the effects of lead on the employee's medical condition, even though the standard does not require removal. In these situations MRP benefits must still be provided as though the standard required removal. Finally, it is important to note that in all cases where removal is required, respirators cannot be used as a substitute. Respirators may be used before removal becomes necessary, but not as an alternative to a transfer to a low-exposure job, or to a lay-off with MRP benefits.

X. Employee Information, Training and Certification subsection (I)

Your employer is required to provide an information and training program for all employees exposed to lead above the action level or who may suffer skin or eye irritation from lead compounds such as lead arsenate or lead azide. The program must train these employees regarding the specific hazards associated with their work environment, protective measures which can be taken, including the contents of any compliance plan in effect, the danger of lead to their bodies (including their reproductive systems), and their rights under the standard. All employees must be trained prior to initial assignment to areas where there is a possibility of exposure over the action level.

This training program must also be provided at least annually thereafter unless further exposure above the action level will not occur.

The California Department of Health Services requires the certification of employees and supervisors performing lead related construction activities in residential and public buildings, as defined in Title 17, California Code of Regulations Division 1, Chapter 8. Lead related construction work is defined in Title 17 as any construction, alteration, painting, demolition, salvage, renovation, repair, or maintenance of any residential or public building, including preparation and cleanup, that, by using or disturbing lead containing material or soil, may result in significant exposure of adults or children to lead. "Public building" means a structure which is generally accessible to the public, including but not limited to, schools, daycare centers, museums, airports, hospitals, stores, convention centers, government facilities, office buildings and any other building which is not an industrial building or a residential building. Where training and certification is required, the training must be given by a training provider accredited by the California Department of Health Services.

XI. Signs-subsection (m)

The standard requires that the following warning sign be posted in each regulated area or work areas where the exposure to lead exceeds the PEL:

WARNING
LEAD WORK AREA POISON
NO SMOKING OR EATING

These signs are to be posted and maintained in a manner which assures that the legend is readily visible.

XII. Record Keeping-subsection (n)

Your employer is required to keep all records of exposure monitoring for airborne lead. These records must include the name and job classification of employees measured, details of the sampling and analytical techniques, the results of this sampling, and the type of respiratory protection being worn by the person sampled. Such records are to be retained for at least 30 years. Your employer is also required to keep all records of biological monitoring and medical examination results. These records must include the names of the employees, the physician's written opinion, and a copy of the results of the examination. Medical records must be preserved and maintained for the duration of employment plus 30 years. However, if the employee's duration of employment is less than one year, the employer need not retain that employee's medical records beyond the period of employment if they are provided to the employee upon termination of employment.

Record keeping is also required if you are temporarily removed from your job under the medical removal protection program. This record must include your name and social security number, the date of your removal and return, how the removal was or is being accomplished, and whether or not the reason for the removal was an elevated blood lead level. Your employer is required to keep each medical removal record only for as long as the duration of an employee's employment.

The standard requires that if you request to see or copy environmental monitoring, blood lead level monitoring, or medical removal records, they must be made available to you or to a representative that you authorize. Your union also has access to these records. Medical records other than BLLs must also be provided upon request to you, to your physician or to any other person whom you may specifically designate. Your union does not have access to your personal medical records unless you authorize their access.

XIII. Observation of Monitoring-subsection (o)

When air monitoring for lead is performed at your workplace as required by this standard, your employer must allow you or someone you designate to act as an observer of the monitoring. Observers are entitled to an explanation of the measurement procedure, and to record the results obtained. Since results will not normally be available at the time of the monitoring, observers are entitled to record or receive the results of the monitoring when returned by the laboratory. Your employer is required to provide the observer with any personal protective devices required to be worn by employees working in the area that is being monitored. The employer must require the observer to wear all such equipment and to comply with all other applicable safety and health procedures.

XIV. Effective Date-subsection (p)

The standard's effective date was November 4, 1993. Employer obligations under the standard begin as of that date with full implementation of engineering controls as soon as possible but no later than within four months, and all other provisions completed as soon as possible, but no later than within two months from the effective date.

XV. For Additional Information

A. A copy of the standard for lead in construction can be obtained free of charge by calling or writing your local Cal/OSHA Office.

B. Additional information about the standard, its enforcement, and your employer's compliance can be obtained from the nearest Cal/OSHA Area Office listed in your telephone directory under State Government Offices/Industrial Relations/ Division of Occupational Safety and Health.

Title 8 California Code of Regulations
APPENDIX C
Medical Surveillance Guidelines

Introduction

The primary purpose of the Occupational Safety and Health Act of 1970 is to assure, so far as possible, safe and healthful working conditions for every working man and woman. The occupational health standard for lead in construction is designed to protect workers exposed to inorganic lead including metallic lead, all inorganic lead compounds and organic lead soaps.

Under this standard occupational exposure to inorganic lead is to be limited to 50 $\mu g/m^3$ (micrograms per cubic meter) based on an 8-hour time-weighted average (TWA). This permissible exposure limit (PEL) must be achieved through a combination of engineering, work practice and administrative controls to the extent feasible. Where these controls are in place but are found not to reduce employee exposures to or below the PEL, they must be used nonetheless, and supplemented with respirators to meet the 50 $\mu g/m^3$ exposure limit.

The standard also provides for a program of biological monitoring for employees exposed to lead above the action level at any time, and additional medical surveillance for all employees exposed to levels of inorganic lead above 30 $\mu g/m^3$ (TWA) for more than 30 days per year and whose BLL exceeds 40 $\mu g/dl$.

The purpose of this document is to outline the medical surveillance provisions of the standard for inorganic lead in construction, and to provide further information to the physician regarding the examination and evaluation of workers exposed to inorganic lead.

Section 1 provides a detailed description of the monitoring procedure including the required frequency of blood testing for exposed workers, provisions for medical removal protection (MRP), the recommended right of the employee to a second medical opinion, and notification and record keeping requirements of the employer. A discussion of the requirements for respirator use and respirator monitoring and OSHA's position on prophylactic chelation therapy are also included in this section.

Section 2 discusses the toxic effects and clinical manifestations of lead poisoning and effects of lead intoxication on enzymatic pathways in heme synthesis. The adverse effects on both male and female reproductive capacity and on the fetus are also discussed.

Section 3 outlines the recommended medical evaluation of the worker exposed to inorganic lead, including details of the medical history, physical examination, and recommended laboratory tests, which are based on the toxic effects of lead as discussed in Section 2.

Section 4 provides detailed information concerning the laboratory tests available for the monitoring of exposed workers. Included also is a discussion of the relative value of each test and the limitations and precautions which are necessary in the interpretation of the laboratory results.

I. Medical Surveillance and Monitoring Requirements for Workers Exposed to Inorganic Lead

Under the standard for inorganic lead in the construction industry, initial medical surveillance consisting of biological monitoring to include blood lead and ZPP level determination shall be provided to employees exposed to lead at or above the action level on any one day. In addition, a program of biological monitoring is to be made available to all employees exposed above the action level at any time and additional medical surveillance is to be made available to all employees exposed to lead above 30 $\mu g/m^3$ TWA for more than 30 days each year and whose BLL exceeds 40 $\mu g/dl$. This program consists of periodic blood sampling and medical evaluation to be performed on a schedule which is defined by previous laboratory results, worker complaints or concerns, and the clinical assessment of the examining physician.

Under this program, the blood lead level (BLL) of all employees who are exposed to lead above 30 $\mu g/m^3$ for more than 30 days per year or whose blood lead is above 40 $\mu g/dl$ but exposed for no more than 30 days per year is to be determined at least every two months for the first six months of exposure and every six months thereafter. The frequency is increased to every two months for employees whose last blood lead level was 40 $\mu g/dl$ or above. For employees who are removed from exposure to lead due to an elevated blood lead, a new blood lead level must be measured monthly. A zinc protoporphyrin (ZPP) measurement is strongly recommended on each occasion that a blood lead level measurement is made.

An annual medical examination and consultation performed under the guidelines discussed in Section 3 is to be made available to each employee exposed above 30 $\mu g/m^3$ for more than 30 days per year for whom a blood test conducted at any time during the preceding 12 months indicated a blood lead level at or above 40 $\mu g/dl$. In addition, a medical examination must be provided as soon as possible after notification by an employee that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice regarding lead exposure and the ability to procreate a healthy child, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during respirator use. An examination is also to be made available to each employee removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited or specially protected pursuant to medical recommendations.

Results of biological monitoring or the recommendations of an examining physician may necessitate removal of an employee from further lead exposure pursuant to the standard's medical removal protection (MRP) program. The object of the MRP program is to provide temporary medical removal to workers either with substantially elevated blood lead levels or otherwise at risk of sustaining material health impairment from continued substantial exposure to lead.

Under the standard's ultimate worker removal criteria, a worker is to be removed from any work having an eight-hour TWA exposure to lead of 30 $\mu g/m^3$ when his or her blood lead level reaches 50 $\mu g/dl$ and is confirmed by a second follow-up blood lead level performed within two weeks after the employer receives the results of the first blood

sampling test. Return of the employee to his or her job status depends on a worker's blood lead level declining to 40 μg/dl.

As part of the standard, the employer is required to notify in writing each employee whose blood lead level exceeds 40 μg/dl. In addition each such employee is to be informed that the standard requires medical removal with MRP benefits, discussed below, when an employee's blood lead level exceeds the above defined limit.

In addition to the above blood lead level criterion, temporary worker removal may also take place as a result of medical determinations and recommendations. Written medical opinions must be prepared after each examination pursuant to the standard. If the examining physician includes a medical finding, determination or opinion that the employee has a medical condition which places the employee at increased risk of material health impairment from exposure to lead, then the employee must be removed from exposure to lead at or above 30 μg/m^3. Alternatively, if the examining physician recommends special protective measures for an employee (e.g., use of a powered air purifying respirator) or recommends limitations on an employee's exposure to lead, then the employer must implement these recommendations.

Recommendations may be more stringent than the specific provisions of the standard. The examining physician, therefore, is given broad flexibility to tailor special protective procedures to the needs of individual employees. This flexibility extends to the evaluation and management of pregnant workers and male and female workers who are planning to raise children. Based on the history, physical examination, and laboratory studies, the physician might recommend special protective measures or medical removal for an employee who is pregnant or who is planning to conceive a child when, in the physician's judgment, continued exposure to lead at the current job would pose a significant risk. The return of the employee to his or her former job status, or the removal of special protections or limitations, depends upon the examining physician determining that the employee is no longer at increased risk of material impairment or that special measures are no longer needed.

During the period of any form of special protection or removal, the employer must maintain the worker's earnings, seniority, and other employment rights and benefits (as though the worker had not been removed) for a period of up to 18 months or for as long as the job the employee was removed from lasts if less than 18 months. This economic protection will maximize meaningful worker participation in the medical surveillance program, and is appropriate as part of the employer's overall obligation to provide a safe and healthful workplace. The provisions of MRP benefits during the employee's removal period may, however, be conditioned upon participation in medical surveillance.

The lead standard provides for a multiple physician review in cases where the employee wishes a second opinion concerning potential lead poisoning or toxicity. If an employee wishes a second opinion, he or she can make an appointment with a physician of his or her choice. This second physician will review the findings, recommendations or determinations of the first physician and conduct any examinations, consultations or tests deemed necessary in an attempt to make a final medical determination. If the first and second physicians do not agree in their assessment they must try to resolve their differences. If they cannot reach an agreement then they must designate a third physician

to resolve the dispute. The employer must provide examining and consulting physicians with the following specific information: A copy of the lead regulations and all appendices, a description of the employee's duties as related to exposure, the exposure level or anticipated level to lead and any other toxic substances (if applicable), a description of personal protective equipment used, blood lead levels, and all prior written medical opinions regarding the employee in the employer's possession or control. The employer must also obtain from the physician and provide the employee with a written medical opinion containing blood lead levels, the physician's opinion as to whether the employee is at risk of material impairment to health, any recommended protective measures for the employee if further exposure is permitted, as well as any recommended limitations upon an employee's use of respirators.

Employers must instruct each physician not to reveal to the employer in writing or in any other way his or her findings, laboratory results, or diagnoses which are felt to be unrelated to occupational lead exposure. They must also instruct each physician to advise the employee of any occupationally or non-occupationally related medical condition requiring further treatment or evaluation.

The standard provides for the use of respirators where engineering and other primary controls are not effective. However, the use of respirator protection shall not be used in lieu of temporary medical removal due to elevated blood lead levels or findings that an employee is at risk of material health impairment. This is based on the numerous inadequacies of respirators including skin rash where the facepiece makes contact with the skin, unacceptable stress to breathing in some workers with underlying cardiopulmonary impairment, difficulty in providing adequate fit, the tendency for respirators to create additional hazards by interfering with vision, hearing, and mobility, and the difficulties of assuring the maximum effectiveness of a complicated work practice program involving respirators. Respirators do, however, serve a useful function where engineering and work practice controls are inadequate by providing supplementary, interim, or short-term protection, provided they are properly selected for the environment in which the employee will be working, properly fitted to the employee, maintained and cleaned periodically, and worn by the employee when required.

In its standard on occupational exposure to inorganic lead in the construction industry, OSHA has prohibited prophylactic chelation. Diagnostic and therapeutic chelation are permitted only under the supervision of a licensed physician with appropriate medical monitoring in an acceptable clinical setting. The decision to initiate chelation therapy must be made on an individual basis and take into account the severity of symptoms felt to be a result of lead toxicity along with blood lead levels, ZPP levels, and other laboratory tests as appropriate. EDTA and penicillamine, which are the primary chelating agents used in the therapy of occupational lead poisoning, have significant potential side effects and their use must be justified on the basis of expected benefits to the worker. Unless frank and severe symptoms are present, therapeutic chelation is not recommended, given the opportunity to remove a worker from exposure and allow the body to naturally excrete accumulated lead. As a diagnostic aid, the chelation mobilization test using Ca-EDTA has limited applicability. According to some investigators, the test can differentiate between lead-induced and other nephropathies. The test may also provide an estimation of the mobile fraction of the total body lead burden.

Employers are required to assure that accurate records are maintained on exposure assessment, including environmental monitoring, medical surveillance, and medical removal for each employee. Exposure assessment records must be kept for at least 30 years. Medical surveillance records must be kept for the duration of employment plus 30 years except in cases where the employment was less than one year. If duration of employment is less than one year, the employer need not retain this record beyond the term of employment if the record is provided to the employee upon termination of employment. Medical removal records also must be maintained for the duration of employment. All records required under the standard must be made available upon request to the Chief and the National Institute for Occupational Safety and Health. Employers must also make environmental and biological monitoring and medical removal records available to affected employees and to former employees or their authorized employee representatives. Employees or their specifically designated representatives have access to their entire medical surveillance records.

In addition, the standard requires that the employer inform all workers exposed to lead at or above 30 $\mu g/m^3$ of the provisions of the standard and all its appendices, the purpose and description of medical surveillance and provisions for medical removal protection if temporary removal is required. An understanding of the potential health effects of lead exposure by all exposed employees along with full understanding of their rights under the lead standard is essential for an effective monitoring program.

II. Adverse Health Effects of Inorganic Lead

Although the toxicity of lead has been known for 2,000 years, the knowledge of the complex relationship between lead exposure and human response is still being refined. Significant research into the toxic properties of lead continues throughout the world, and it should be anticipated that our understanding of thresholds of effects and margins of safety will be improved in future years. The provisions of the lead standard are founded on two prime medical judgments: First, the prevention of adverse health effects from exposure to lead throughout a working lifetime requires that worker blood lead levels be maintained at or below 40 $\mu g/dl$, and second, the blood lead levels of workers, male or female, who intend to parent in the near future should be maintained below 30 $\mu g/dl$ to minimize adverse reproductive health effects to the parents and developing fetus. The adverse effects of lead on reproduction are being actively researched and OSHA encourages the physician to remain abreast of recent developments in the area to best advise pregnant workers or workers planning to conceive children.

The spectrum of health effects caused by lead exposure can be subdivided into five developmental stages: Normal, physiological changes of uncertain significance, pathophysiological changes, overt symptoms (morbidity), and mortality. Within this process there are no sharp distinctions, but rather a continuum of effects. Boundaries between categories overlap due to the wide variation of individual responses and exposures in the working population. OSHA's development of the lead standard focused on pathophysiological changes as well as later stages of disease.

1. Heme Synthesis Inhibition. The earliest demonstrated effect of lead involves its ability to inhibit at least two enzymes of the heme synthesis pathway at very low blood levels. Inhibition of delta aminolevulinic acid

dehydrase (ALA-D) which catalyzes the conversion of delta-aminolevulinic acid (ALA) to protoporphyrin is observed at a blood lead level below 20 μg/dl. At a blood lead level of 40 μg/dl, more than 20% of the population would have 70% inhibition of ALA-D. There is an exponential increase in ALA excretion at blood lead levels greater than 40 μg/dl.

Another enzyme, ferrochelatase, is also inhibited at low blood lead levels. Inhibition of ferrochelatase leads to increased free erythrocyte protoporphyrn (FEP) in the blood which can then bind to zinc to yield zinc protoporphyrin. At a blood lead level of 50 μg/dl or greater, A-16 nearly 100% of the population will have an increase in FEP. There is also an exponential relationship between blood lead levels greater than 40 μg/dl and the associated ZPP level, which has led to the development of the ZPP screening test for lead exposure.

While the significance of these effects is subject to debate, it is OSHA's position that these enzyme disturbances are early stages of a disease process which may eventually result in the clinical symptoms of lead poisoning. Whether or not the effects do progress to the later stages of clinical disease, disruption of these enzyme processes over a working lifetime is considered to be a material impairment of health.

One of the eventual results of lead-induced inhibition of enzymes in the heme synthesis pathway is anemia which can be asymptomatic if mild but associated with a wide array of symptoms including dizziness, fatigue, and tachycardia when more severe. Studies have indicated that lead levels as low as 50 μg/dl can be associated with a definite decreased hemoglobin, although most cases of lead-induced anemia, as well as shortened red-cell survival times, occur at lead levels exceeding 80 μg/dl. Inhibited hemoglobin synthesis is more common in chronic cases whereas shortened erythrocyte life span is more common in acute cases.

In lead-induced anemias, there is usually a reticulocytosis along with the presence of basophilic stippling, and ringed sideroblasts, although none of the above are pathognomonic for lead-induced anemia.

2. Neurological Effects. Inorganic lead has been found to have toxic effects on both the central and peripheral nervous systems. The earliest stages of lead-induced central nervous system effects first manifest themselves in the form of behavioral disturbances and central nervous system symptoms including irritability, restlessness, insomnia and other sleep disturbances, fatigue, vertigo, headache, poor memory, tremor, depression, and apathy. With more severe exposure, symptoms can progress to drowsiness, stupor, hallucinations, delirium, convulsions and coma.

   The most severe and acute form of lead poisoning which usually follows ingestion or inhalation of large amounts of lead is acute encephalopathy which may arise precipitously with the onset of intractable seizures, coma,

cardiorespiratory arrest, and death within 48 hours. While there is disagreement about what exposure levels are needed to produce the earliest symptoms, most experts agree that symptoms definitely can occur at blood lead levels of 60 μg/dl whole blood and therefore recommend a 40 μg/dl maximum. The central nervous system effects frequently are not reversible following discontinued exposure or chelation therapy and when improvement does occur, it is almost always only partial.

The peripheral neuropathy resulting from lead exposure characteristically involves only motor function with minimal sensory damage and has a marked predilection for the extensor muscles of the most active extremity. The peripheral neuropathy can occur with varying degrees of severity. The earliest and mildest form which can be detected in workers with blood lead levels as low as 50 μg/dl is manifested by slowing of motor nerve conduction velocity often without clinical symptoms. With progression of the neuropathy there is development of painless extensor muscle weakness usually involving the extensor muscles of the fingers and hand in the most active upper extremity, followed in severe cases by wrist drop or, much less commonly, foot drop.

In addition to slowing of nerve conduction, electromyographical studies in patients with blood lead levels greater than 50 μg/dl have demonstrated a decrease in the number of acting motor unit potentials, an increase in the duration of motor unit potentials, and spontaneous pathological activity including fibrillations and fasciculations. Whether these effects occur at levels of 40 μg/dl is undetermined.

While the peripheral neuropathies can occasionally be reversed with therapy, again such recovery is not assured particularly in the more severe neuropathies and often improvement is only partial. The lack of reversibility is felt to be due in part to segmental demyelination.

3. Gastrointestinal. Lead may also affect the gastrointestinal system producing abdominal colic or diffuse abdominal pain, constipation, obstipation, diarrhea, anorexia, nausea and vomiting. Lead colic rarely develops at blood lead levels below 80 μg/dl.

4. Renal. Renal toxicity represents one of the most serious health effects of lead poisoning. In the early stages of disease nuclear inclusion bodies can frequently be identified in proximal renal tubular cells. Renal function remains normal and the changes in this stage are probably reversible. With more advanced disease there is progressive interstitial fibrosis and impaired renal function. Eventually extensive interstitial fibrosis ensues with sclerotic glomeruli and dilated and atrophied proximal tubules; all represent end-stage kidney disease. Azotemia can be progressive, eventually resulting in frank uremia necessitating dialysis. There is occasionally associated hypertension and hyperuricemia with or without gout.

Early kidney disease is difficult to detect. The urmalysis is normal in early lead nephropathy and the blood urea nitrogen and serum creatinine increase only when two-thirds of kidney function is lost. Measurement of creatinine clearance can often detect earlier disease as can other methods of measurement of glomerular filtration rate. An abnormal Ca-EDTA mobilization test has been used to differentiate between lead-induced and other nephropathies, but this procedure is not widely accepted. A form of Fanconi syndrome with aminoaciduria, glycosuria, and hyperphosphaturia indicating severe injury to the proximal renal tubules is occasionally seen in children.

5. Reproductive effects. Exposure to lead can have serious effects on reproductive function in both males and females. In male workers exposed to lead there can be a decrease in sexual drive, impotence, decreased ability to produce healthy sperm, and sterility. Malformed sperm (teratospermia), decreased number of sperm (hypospermia), and sperm with decreased motility (asthenospermia) can all occur. Teratospermia has been noted at mean blood lead levels of 53 μg/dl and hypospermia and asthenospermia at 41 μg/dl. Furthermore, there appears to be a dose-response relationship for teratospermia in lead exposed workers.

   Women exposed to lead may experience menstrual disturbances including dysmenorrhea, menorrhagia and amenorrhea. Following exposure to lead, women have a higher frequency of sterility, premature births, spontaneous miscarriages, and stillbirths.

   Germ cells can be affected by lead and cause genetic damage in the egg or sperm cells before conception and result in failure to implant, miscarriage, stillbirth, or birth defects.

   Infants of mothers with lead poisoning have a higher mortality during the first year and suffer from lowered birth weights, slower growth, and nervous system disorders. Lead can pass through the placental barrier and lead levels in the mother's blood are comparable to concentrations of lead in the umbilical cord at birth. Transplacental passage becomes detectable at 12 to 14 weeks of gestation and increases until birth.

   There is little direct data on damage to the fetus from exposure to lead but it is generally assumed that the fetus and newborn would be at least as susceptible to neurological damage as young children. Blood lead levels of 50 to 60 μg/dl in children can cause significant neurobehavioral impairments and there is evidence of hyperactivity at blood levels as low as 25 μg/dl. Given the overall body of literature concerning the adverse health effects of lead in children, OSHA feels that the blood lead level in children should be maintained below 30 μg/dl with a population mean of 15 μg/dl. Blood lead levels in the fetus and newborn likewise should not exceed 30 μg/dl.

Because of lead's ability to pass through the placental barrier and also because of the demonstrated adverse effects of lead on reproductive function in both the male and female as well as the risk of genetic damage of lead on both the ovum and sperm, OSHA recommends a 30 μg/dl maximum permissible blood lead level in both males and females who wish to bear children.

6. Other toxic effects. Debate and research continue on the effects of lead on the human body. Hypertension has frequently been noted in occupationally exposed individuals although it is difficult to assess whether this is due to lead's adverse effects on the kidney or if some other mechanism is involved. Vascular and electrocardiographic changes have been detected but have not been well characterized. Lead is thought to impair thyroid function and interfere with the pituitary-adrenal axis, but again these effects have not been well defined.

III. Medical Evaluation

The most important principle in evaluating a worker for any occupational disease including lead poisoning is a high index of suspicion on the part of the examining physician. As discussed in Section 2, lead can affect numerous organ systems and produce a wide array of signs and symptoms, most of which are non-specific and subtle in nature at least in the early stages of disease. Unless serious concern for lead toxicity is present, many of the early clues to diagnosis may easily be overlooked.

The crucial initial step in the medical evaluation is recognizing that a worker's employment can result in exposure to lead. The worker will frequently be able to define exposures to lead and lead containing materials but often will not volunteer this information unless specifically asked. In other situations the worker may not know of any exposures to lead but the suspicion might be raised on the part of the physician because of the industry or occupation of the worker. Potential occupational exposure to lead and its compounds occur in many occupations in the construction industry, including demolition and salvaging operations, removal or encapsulation of materials containing lead, construction, alteration, repair or renovation of structures containing lead, transportation, disposal, storage or containment of lead or lead-containing materials on construction sites, and maintenance operations associated with construction activities.

Once the possibility for lead exposure is raised, the focus can then be directed toward eliciting information from the medical history, physical exam, and finally from laboratory data to evaluate the worker for potential lead toxicity.

A complete and detailed work history is important in the initial evaluation. A listing of all previous employment with information on job description, exposure to fumes or dust, known exposures to lead or other toxic substances, a description of any personal protective equipment used, and previous medical surveillance should all be included in the worker's record. Where exposure to lead is suspected, information concerning on-the-job personal hygiene, smoking or eating habits in work areas, laundry procedures, and use of any protective clothing or respiratory protection equipment should be noted. A complete work history is essential in the medical evaluation of a worker with suspected

lead toxicity, especially when long term effects such as neurotoxicity and nephrotoxicity are considered.

The medical history is also of fundamental importance and should include a listing of all past and current medical conditions, current medications including proprietary drug intake, previous surgeries and hospitalizations, allergies, smoking history, alcohol consumption, and also non-occupational lead exposures such as hobbies (hunting, riflery). Also known childhood exposures should be elicited. Any previous history of hematological, neurological, gastrointestinal, renal, psychological, gynecological, genetic, or reproductive problems should be specifically noted.

A careful and complete review of systems must be performed to assess both recognized complaints and subtle or slowly acquired symptoms which the worker might not appreciate as being significant. The review of symptoms should include the following:

1. General-weight loss, fatigue, decreased appetite.
2. Head, Eyes, Ears, Nose, Throat (HEENT)-headaches, visual disturbances or decreased visual acuity, hearing deficits or tinnitus, pigmentation of the oral mucosa, or metallic taste in mouth.
3. Cardio-pulmonary-shortness of breath, cough, chest pains, palpitations, or orthopnea.
4. Gastrointestinal-nausea, vomiting, heartburn, abdominal pain, constipation or diarrhea.
5. Neurological-irritability, insomnia, weakness (fatigue), dizziness, loss of memory, confusion, hallucinations, incoordination, ataxia, decreased strength in hands or feet, disturbances in gait, difficulty in climbing stairs, or seizures.
6. Hematological-pallor, easy fatigability, abnormal blood loss, melena.
7. Reproductive (male and female and spouse where relevant)-history of infertility, impotence, loss of libido, abnormal menstrual periods, history of miscarriages, stillbirths, or children with birth defects.
8. Musculo-skeletal-muscle and joint pains.

The physical examination should emphasize the neurological, gastrointestinal, and cardiovascular systems. The worker's weight and blood pressure should be recorded and the oral mucosa checked for pigmentation characteristic of a possible Burtonian or lead line on the gingiva. It should be noted, however, that the lead line may not be present even in severe lead poisoning if good oral hygiene is practiced.

The presence of pallor on skin examination may indicate an anemia which, if severe, might also be associated with a tachycardia. If an anemia is suspected, an active search for blood loss should be undertaken including potential blood loss through the gastrointestinal tract.

A complete neurological examination should include an adequate mental status evaluation including a search for behavioral and psychological disturbances, memory testing, evaluation for irritability, insomnia, hallucinations, and mental clouding. Gait and coordination should be examined along with close observation for tremor. A detailed evaluation of peripheral nerve function including careful sensory and motor function

testing is warranted. Strength testing particularly of extensor muscle groups of all extremities is of fundamental importance.

Cranial nerve evaluation should also be included in the routine examination.

The abdominal examination should include auscultation for bowel sounds and abdominal bruits and palpation for organomegaly, masses, and diffuse abdominal tenderness.

Cardiovascular examination should evaluate possible early signs of congestive heart failure. Pulmonary status should be addressed particularly if respirator protection is contemplated.

As part of the medical evaluation, the interim lead standard requires the following laboratory studies:

1. Blood lead level
2. Hemoglobin and hematocrit determinations, red cell indices, and examination of the peripheral blood smear to evaluate red blood cell morphology
3. Blood urea nitrogen
4. Serum creatinine
5. Routine urinalysis with microscopic examination
6. A zinc protoporphyrin level.

In addition to the above, the physician is authorized to order any further laboratory or other tests which he or she deems necessary in accordance with sound medical practice. The evaluation must also include pregnancy testing or laboratory evaluation of male fertility if requested by the employee. Additional tests which are probably not warranted on a routine basis but may be appropriate when blood lead and ZPP levels are equivocal include delta aminolevulinic acid and coproporphyrin concentrations in the urine, and dark-field illumination for detection of basophilic stippling in red blood cells.

If an anemia is detected further studies including a careful examination of the peripheral smear, reticulocyte count, stool for occult blood, serum iron, total iron binding capacity, bilirubin, and, if appropriate, vitamin B12 and folate may be of value in attempting to identify the cause of the anemia.

If a peripheral neuropathy is suspected, nerve conduction studies are warranted both for diagnosis and as a basis to monitor any therapy.

If renal disease is questioned, a 24-hour urine collection for creatinine clearance, protein, and electrolytes may be indicated. Elevated uric acid levels may result from lead-induced renal disease and a serum uric acid level might be performed.

An electrocardiogram and chest x-ray may be obtained as deemed appropriate. Sophisticated and highly specialized testing should not be done routinely and where indicated should be under the direction of a specialist.

IV. Laboratory Evaluation

The blood lead level at present remains the single most important test to monitor lead exposure and is the test used in the medical surveillance program under the lead standard to guide employee medical removal. The ZPP has several advantages over the blood lead level. Because of its relatively recent development and the lack of extensive data concerning its interpretation, the ZPP currently remains an ancillary test.

This section will discuss the blood lead level and ZPP in detail and will outline their relative advantages and disadvantages. Other blood tests currently available to evaluate lead exposure will also be reviewed.

The blood lead level is a good index of current or recent lead absorption when there is no anemia present and when the worker has not taken any chelating agents. However, blood lead levels along with urinary lead levels do not necessarily indicate the total body burden of lead and are not adequate measures of past exposure. One reason for this is that lead has a high affinity for bone and up to 90% of the body's total lead is deposited there. A very important component of the total lead body burden is lead in soft tissue (liver, kidney, and brain). This fraction of the lead body burden, the biologically active lead, is not entirely reflected by blood lead levels since it is a function of the dynamics of lead absorption, distribution, deposition in bone and excretion. Following discontinuation of exposure to lead, the excess body burden is only slowly mobilized from bone and other relatively stable body stores and excreted. Consequently, a high blood lead level may only represent recent heavy exposure to lead without a significant total body excess and likewise a low blood lead level does not exclude an elevated total body burden of lead.

Also due to its correlation with recent exposures, the blood lead level may vary considerably over short time intervals.

To minimize laboratory error and erroneous results due to contamination, blood specimens must be carefully collected after thorough cleaning of the skin with appropriate methods using lead-free blood containers and analyzed by a reliable laboratory. Under the standard, samples must be analyzed in laboratories which are approved by OSHA. Analysis is to be made using atomic absorption spectrophotometry, anodic stripping voltammetry or any method which meets the accuracy requirements set forth by the standard.

The determination of lead in urine is generally considered a less reliable monitoring technique than analysis of whole blood primarily due to individual variability in urinary excretion capacity as well as the technical difficulty of obtaining accurate 24-hour urine collections. In addition, workers with renal insufficiency, whether due to lead or some other cause, may have decreased lead clearance and consequently urine lead levels may underestimate the true lead burden. Therefore, urine lead levels should not be used as a routine test.

The zinc protoporphyrin test, unlike the blood lead determination, measures an adverse metabolic effect of lead and as such is a better indicator of lead toxicity than the level of blood lead itself. The level of ZPP reflects lead absorption over the preceding 3 to 4 months, and therefore is a better indicator of lead body burden. The ZPP requires more time than the blood lead to read significantly elevated levels; the return to normal after

discontinuing lead exposure is also slower. Furthermore, the ZPP test is simpler, faster, and less expensive to perform and no contamination is possible. Many investigators believe it is the most reliable means of monitoring chronic lead absorption.

Zinc protoporphyrin results from the inhibition of the enzyme ferrochelatase which catalyzes the insertion of an iron molecule into the protoporphyrin molecule, which then becomes heme. If iron is not inserted into the molecule then zinc, having a greater affinity for protoporphyrin, takes the place of the iron, forming ZPP.

An elevation in the level of circulating ZPP may occur at blood lead levels as low as 20 to 30 μg/dl in some workers. Once the blood lead level has reached 40 μg/dl there is more marked rise in the ZPP value from its normal range of less than 100 μg/dl. Increases in blood lead levels beyond 40 μg/dl are associated with exponential increases in ZPP.

Whereas blood lead levels fluctuate over short time spans, ZPP levels remain relatively stable. ZPP is measured directly in red blood cells and is present for the cell's entire 120-day life span. Therefore, the ZPP level in blood reflects the average ZPP production over the previous 3 to 4 months and consequently the average lead exposure during that time interval.

It is recommended that a hematocrit be determined whenever a confirmed ZPP of 50 μg/dl whole blood is obtained to rule out a significant underlying anemia. If the ZPP is in excess of 100 μg/dl and not associated with abnormal elevations in blood lead levels, the laboratory should be checked to be sure that blood leads were determined using atomic absorption spectrophotometry anodic stripping voltammetry, or any method which meets the accuracy requirements set forth by the standard by an OSHA approved laboratory which is experienced in lead level determinations. Repeat periodic blood lead studies should be obtained in all individuals with elevated ZPP levels to be certain that an associated elevated blood lead level has not been missed due to transient fluctuations in blood leads.

ZPP has a characteristic fluorescence spectrum with a peak at 594 nm which is detectable with a hematofluorometer. The hematofluorometer is accurate and portable and can provide on-site, instantaneous results for workers who can be frequently tested via a finger prick.

However, careful attention must be given to calibration and quality control procedures. Limited data on blood lead-ZPP correlations and the ZPP levels which are associated with the adverse health effects discussed in Section 2 are the major limitations of the test. Also it is difficult to correlate ZPP levels with environmental exposure and there is some variation of response with age and sex. Nevertheless, the ZPP promises to be an important diagnostic test for the early detection of lead toxicity and its value will increase as more data is collected regarding its relationship to other manifestations of lead poisoning.

Levels of delta-aminolevulinic acid (ALA) in the urme are also used as a measure of lead exposure. Increasing concentrations of ALA are believed to result from the inhibition of the enzyme deltaaminolevulinic acid dehydrase (ALA-D). Although the test is relatively easy to perform, inexpensive, and rapid, the disadvantages include variability in results,

the necessity to collect a complete 24-hour urine sample which has a specific gravity greater than 1.010, and also the fact that ALA decomposes in the presence of light.

The pattern of porphyrin excretion in the urine can also be helpful in identifying lead intoxication. With lead poisoning, the urine concentrations of coproporphyrins I and II, porphobilinogen and uroporphyrin I rise. The most important increase, however, is that of coproporphyrin III; levels may exceed 5,000 μg/l in the urine in lead poisoned individuals, but its correlation with blood lead levels and ZPP are not as good as those of ALA. Increases in urinary porphyrins are not diagnostic of lead toxicity and may be seen in porphyria, some liver diseases, and in patients with high reticulocyte counts.

Summary. The standard for inorganic lead in the construction industry places significant emphasis on the medical surveillance of all workers exposed to levels of inorganic lead above 30 $\mu g/m^3$ TWA. The physician has a fundamental role in this surveillance program, and in the operation of the medical removal protection program.

Even with adequate worker education on the adverse health effects of lead and appropriate training in work practices, personal hygiene and other control measures, the physician has a primary responsibility for evaluating potential lead toxicity in the worker. It is only through a careful and detailed medical and work history, a complete physical examination and appropriate laboratory testing that an accurate assessment can be made. Many of the adverse health effects of lead toxicity are either irreversible or only partially reversible and therefore early detection of disease is very important.

This document outlines the medical monitoring program as defined by the occupational safety and health standard for inorganic lead. It reviews the adverse health effects of lead poisoning and describes the important elements of the history and physical examinations as they relate to these adverse effects. Finally, the appropriate laboratory testing for evaluating lead exposure and toxicity is presented.

It is hoped that this review and discussion will give the physician a better understanding of the OSHA standard with the ultimate goal of protecting the health and well-being of the worker exposed to lead under his or her care.

Date: _____

This plan has been developed to comply with the OSHA Construction Lead Standard, 29 CFR 1926.82. [and more]

1. Location of Project:

This job will take place at the residence located at _____ (full address).

A previous lead inspection of this residence by _____(name and address of inspection or risk assessment firm) revealed that lead hazards or lead-based paint are present in the following locations (location and name of all building components to be treated):

_____
_____

These building components are coated with lead-based paint and represent a hazard to workers who may disturb it during lead hazard control, renovation, or maintenance activities.

2. Brief Description of Job:

This job will involve the following lead hazard reduction measures (complete all that apply):

Replacement of _____ (name all components)
Enclosure of _____ (name all components)
Paint removal of _____ (name all components)
Encapsulation of _____ (name all components)
Paint film stabilization of _____ (name all components)
Friction surface treatments of _____ (name all components)
Impact surface treatments of _____ (name all components)
Dust removal in the following areas: _____(name all areas)

3. Schedule:

The job is expected to start on _____ and end on _____ (date). This compliance plan will take effect immediately on _____(date). The competent person will conduct worksite visual inspections on a daily basis.

Work will proceed according to the following schedule:

Day 1: Initial setup, followed by:
_____(name all tasks to be completed)
_____
_____
Daily cleanup: wet mopping, HEPA vacuuming

Day 2: Tasks

Day 3: Tasks

Day 4: Final cleanup and clearance examination

4. Equipment and Materials:

HEPA vacuums, cleaning detergents, protective clothing, cotton work gloves, electric power saws, hammers, wrecking bars, pry bars, screwdrivers, plastic sheeting, metal scrapers, compressed air-powered water pumps, rollers, brushes, butyl rubber gloves, respirators, cutting shears, mops, plastic sheeting, paintbrushes, paint rollers.

5. Crew:
The work will be completed by a crew of _____ (insert number) workers. Crew assignments are as follows:

Crew 1 _____(name) _____(task)
Crew 2 _____(name) _____(task)

6. Competent Person:

_____(Name), a certified lead abatement supervisor, will be onsite at all times and will act as the competent person for occupational health and safety issues. The lead supervisor license (or certificate) number is: _____. The lead supervisor will conduct daily inspections of the work areas to ensure that control measures, work practices, personal protective equipment, and hygiene facilities are used as prescribed in this document.

7. Control Measures:

The primary control methods for this project are (check all that apply):
_____ method substitution (building component replacement, enclosure)
_____ wet methods
_____ wrapping materials to be discarded in plastic
_____ respiratory protection
_____ local exhaust ventilation (needle guns, vacuum blasting)
_____ general room ventilation
_____ on-the-job training
_____ HEPA vacuums
_____ containment (use of plastic barriers)

8. Technology Considered in Meeting the Permissible Exposure Limit:

The *HUD Guidelines for Evaluation and Control of Lead Hazards in Housing* and *Protecting Workers and Their Communities From Lead Hazards: A Guide for Protective Work Practices,* published by the Society of Occupational and Environmental Health, and other publications were reviewed to determine the appropriate engineering controls to be used in this project. The only

specialized equipment that will be utilized for this project are HEPA-filtered vacuum cleaners and _____ (name all special equipment).

9. Respirators:

All individuals in the work area will be provided with a NIOSH/MSHA-approved half-mask, air-purifying respirator equipped with HEPA cartridges or a powered air-purifying respirator (if so requested).

Respirators will be provided in the context of a complete respiratory protection program; the written respirator program is attached.

Respirators will be required during (name phases of job for which respirators will be required):

_____
_____
_____

Respirator use during other activities, including initial setup (laying down plastic for containment), and enclosure and encapsulation after surface preparation is not necessary, *unless* other workers nearby (same interior room or outside wall) are performing activities for which respirators are required.

10. Protective Clothing:

Disposable protective clothing will be worn at all times inside the work area. Protective clothing will be made of breathable fabric to reduce the potential for worker heat stress. If visibly contaminated with dust or paint chips, protective clothing will be vacuumed before it is removed.

11. Hygiene Facilities:

Handwashing facilities will be used to decontaminate workers, since leaded dust levels are expected to be low. Showers are used on jobs that generate high leaded dust levels. The facilities will be located in a portable trailer, which will be parked in the driveway of the residence. The trailer will contain two sinks, a fresh water tank, hot water heater, wastewater collection tank, and easily cleanable floors and benches. Labeled plastic bins with covers will be used to separate disposable protective clothing from street clothing. Hot water, soap, and towels will be provided. Hands and face will be washed before all breaks and at the end of the day. Wastewater will be collected, pretreated onsite with filtration, and disposed of in accordance with prior arrangements made with _____(name of local water and sewage authority).

12. Air Monitoring Data:

Previous data for lead hazard control projects conducted with similar controls, environmental conditions, personnel, and methods were reviewed. Air sampling will not be performed on this job, since typical exposures have already been established for these work crews by: _____(name of person or firm completing air sampling).

Based on these results, the major exposures to lead will occur during _____ (name tasks during which substantial exposures are likely to occur).

In previous work conducted by the same contractor and work crew on similar houses in the same city, using the same methods, *maximum* personal exposures measured for various activities were:

Maximum Exposure ($\mu g/m^3$)	**Task**
_____	_____
_____	_____
_____	_____
_____	_____

The environmental conditions in the homes previously abated closely resemble the current location. These maximum exposures are expected to represent "worst-case" exposures because they did not include breaks or setup time; it is expected that 8-hour, time-weighted average exposures on this job will be lower than these figures. However, worker respiratory protection requirements will be based on the maximum exposures to allow for unexpected variations.

13. Medical Surveillance Program:

A medical surveillance program is already in place for this work crew. It is supervised by: Dr. _____(name, address, and phone number of physician and/or firm).

Worker blood lead levels are measured initially before the onset of work, each month for the first 6 months of employment, and every 6 months thereafter.

Blood lead levels for current employees who will be assigned to this job are between:

_____μg/dl to _____ μg/dl (list range of blood lead levels) based on the report dated _____ (add date for latest- medical monitoring report). Worker blood lead increases of 10 μg/dl or greater or any blood lead level greater than 25 μg/dl will trigger an investigation of protective equipment and work practices. All workers on this project are informed of their blood lead levels as soon as they are received.

14. Training:

The following workers have been trained using the EPA Worker Training Curriculum and SOEH's *Guide For Protective Work Practices and Effective Worker Training*. The training was conducted by _____(name. address, and phone number of training provider) on _____(insert date).

Trainees	**Social Security Number**
_____	_____
_____	_____
_____	_____
_____	_____

Plan completed by:
_____(name and signature)
_____(date)

Example of a Completed Worker Protection Compliance Plan for "High-risk" Jobs

Date: 5/19/99

This plan has been developed to comply with the OSHA Construction Lead Standard, 29 CFR 1926.62. [and more]

1. Location of Project:

This job will take place at a private residence located at 2952 Channing Way, Anywhere, New York. A previous lead inspection of this residence by Carefree Consultants, Inc., revealed that windows, window frames, and all interior walls in both units are coated with lead-based paint (the range was 1.5 mg/cm^2 to 24 mg/cm^2). In some areas the existing lead-based paint is deteriorated, with loose and peeling paint chips. The existing lead-based paint represents a hazard to workers who may disturb it during lead hazard control or renovation activities.

2. Brief Description of Job:

The abatement job will involve the removal and replacement of six windows in the residence and the encapsulation or enclosure of kitchen and bathroom walls. The primary window replacement activities that are expected to generate leaded dust are manual removal of existing wood frame windows and cleaning.

3. Schedule:

Work will proceed according to the following schedule:

Window Replacement

Day 1: Initial setup, including placement of plastic sheeting on interior floor and exterior ground surfaces for containment purposes.
Begin manual removal of windows. All window components will be wetted with water mist prior to removal to minimize dust generation.

Daily cleanup: wet sweeping, HEPA vacuuming

Day 2: Complete removal of all windows.

Preparation of window openings for replacement windows-sawing or planing may be required.

Install replacement windows; employ daily cleanup as above.

Apply new caulking around replacement windows; final cleanup.

Encapsulation and Enclosure

Day 1: Initial setup, including placement of plastic sheeting on floors, and non-movable furnishings, appliances, and furniture items.

Prepare surfaces for enclosure system by removing loose and peeling paint. All surfaces will be thoroughly wetted with water mist prior to scraping. Surfaces will be lightly scraped with 9-inch metal paint scrapers.

Daily cleanup: wet sweeping followed by HEPA vacuuming and mopping with detergent solution

Day 2: Install all mineral glass wallcovering material.

Manually apply the initial and final coats of the liquid encapsulant, polymer surfacing system over the mineral glass substrate. Rollers and brushes should be used to apply liquid encapsulant. Allow 8 hours to dry between coats, or until surface is hard and dry to the touch. Install enclosure system (drywall) over encapsulated surface.

Daily cleanup

Day 3: Final cleaning

4. Equipment and Materials:

Window Replacement

"Olofson" metal frame, thermal-pane, replacement windows (Model 000-111), HEPA vacuums, trisodium phosphate detergent, protective clothing, cotton work gloves, electric power saws, hammers, wrecking bars, pry bars, screwdrivers, plastic sheeting, and other hand tools as needed.

The abatement job will also include encapsulation or enclosure of all interior walls in the kitchen and bathroom areas. The primary activities that are expected to generate leaded dust are manual scraping and cleaning involved with surface preparation.

Encapsulation and Enclosure

"Cover It Up" Encapsulant System (Item 333-55), drywall, metal scrapers, compressed air-powered water pumps, rollers, brushes, butyl rubber gloves, respirators, cutting shears, brooms, HEPA vacuums, detergent solution, mops, and plastic sheeting.

The job is expected to start on July 11, 1999, and end on July 13, 1999. This compliance plan will take effect immediately on July 8, 1999. The competent person will conduct worksite visual inspections on a daily basis.

5. Crew:

The replacement of windows and encapsulation enclosure will each be completed by a crew of two workers. Crew assignments are as follows:

R. Smith, T. Jones Crew 1, Window Replacement

Z. Topp, J. Gonzales Crew 2, Encapsulation/Enclosure

6. Competent Person:

Mr. Homer Simpson, a licensed lead abatement supervisor, will be onsite at all times and will act as the competent person for occupational health and safety issues. Mr. Simpson's lead supervisor license number is: XMZ 678. Mr. Simpson will conduct daily inspections of the work areas to ensure that control measures, work practices, personal protective equipment, and hygiene facilities are used as prescribed in this document.

7. Control Measures:

The primary control method for this project is method substitution; that is, building component replacement and encapsulation and enclosure will be used for lead-based paint hazard abatement, instead of onsite paint removal.

During replacement, existing window frames, sashes, and troughs will be wetted with water mist prior to removal to reduce airborne dust generation during removal activities. During both replacement and encapsulation, all scraping or sawing activity will be done on wet surfaces; all debris will be wetted down before handling. Building components coated with lead-based paint will be wrapped in plastic sheeting after removal to reduce contamination of workers' hands and clothing during handling and disposal. After initial surface preparation for encapsulation and window removal, it is expected that there will be minimal disturbance of existing lead coatings during this job. Wet methods (mopping) and HEPA vacuums will be used during cleaning to minimize worker exposures to lead.

To reduce generation of leaded dust in the work areas, paint chips and dust will be vacuumed on at least a daily basis with HEPA-filtered vacuums. Final cleaning will be accomplished by three successive cleanings consisting of HEPA vacuuming alternated with wet mopping with trisodium phosphate solution. The use of HEPA vacuums and wet cleaning methods will minimize worker lead exposures.

8. Technology Considered in Meeting the Permissible Exposure Limit:

The HUD Guidelines for Evaluation and Control of lead Hazards in Housing and other publications were reviewed to determine the appropriate engineering controls to be used in this project. The only specialized equipment that will be utilized for this project are HEPA-filtered vacuum cleaners and air-powered water pumps with high-pressure hoses attached to aerosol-generating nozzles (for water misting of surfaces). Natural ventilation will be utilized, as mechanical ventilation with HEPA-filtered exhaust fans has not been found to reduce worker lead exposures with the methods that will be used during this project.

9. Respirators:

All individuals in the work area will be provided with a half-mask, air-purifying respirator equipped with HEPA cartridges or a powered air-purifying respirator if so requested. Respirators will be provided in the context of a complete respiratory protection program; the written respirator program is attached.
Respirators will be required during window removal, surface preparation for encapsulation, any sawing or use of power tools, manual scraping, cleaning activities, and final cleanup. Respirator

use during other activities, including initial setup (such as laying down plastic for containment), and enclosure and encapsulation after surface preparation is not necessary, *unless* other workers nearby (same interior room or outside wall) are performing activities for which respirators are required.

10. Protective Clothing:

Disposable protective clothing will be worn at all times inside the work area. Protective clothing will be made of breathable fabric to reduce the potential for worker heat stress. If visibly contaminated with paint dust or chips, protective clothing will be vacuumed before it is removed.

11. Hygiene Facilities:

Handwashing facilities will be used to decontaminate workers. The facilities will be located in a portable trailer that will be parked in the driveway or parking area of the residence. The trailer will contain two sinks, a fresh water tank, hot water heater, wastewater collection tank, and easily cleanable floors and benches. Labeled plastic bins with covers will be used to separate disposable protective clothing from street clothing. Hot water, soap, and towels will be provided. Hands and face will be washed before all breaks and at the end of the day. Wastewater will be collected, pretreated onsite with filtration, and disposed of in accordance with prior arrangements made with the Anywhere Municipal Wastewater Treatment Facility. The trailer will be cleaned with a HEPA vacuum and wet washed twice each week.

12. Air Monitoring Data:

Previous data for lead abatement projects conducted with similar controls, environmental conditions, personnel, and methods were reviewed. Air sampling will not be performed on this job, since typical exposures have already been established for these work crews (see attached report from previous jobs prepared by XYZ Industrial Hygiene, Inc.). Based on these results, the major exposures to lead will occur during window removal, although significant exposures may also occur during cleanup.

In previous work conducted by the same contractor and work crew on similar houses in the same city, using the same methods, *maximum* personal exposures measured for various activities were: window removal and replacement, 121 $\mu g/m^3$; encapsulation, 24 $\mu g/m^3$; cleaning, 110 $\mu g/m^3$; final cleaning, 50 $\mu g/m^3$; and initial setup, 6 $\mu g/m^3$. The environmental conditions in the homes previously abated closely resemble the current location. These maximum exposures are expected to represent "worst-case" exposures because they did not include breaks or setup time; it is expected that 8-hour, time-weighted average exposures on this job will be lower than these figures. However, worker respiratory protection requirements will be based on the maximum exposures to allow for unexpected variations.

13. Medical Surveillance Program:

A medical surveillance program is already in place for this work crew. It is supervised by Dr. William Jones, a board-certified occupational health physician with Occupational Health Clinic, Inc. (phone: 800-555-1111) Worker blood lead levels are measured initially before the onset of work, each month for the first 6 months of employment, and every 6 months thereafter. Blood lead levels for current employees who will be assigned to this job are 5-12 $\mu g/dl$, based on the

May report (see attached). Worker blood lead increases of 10 μg/dl or more will trigger an investigation of protective equipment and work practices. All workers on this project are informed of their blood lead levels as soon as they are received.

14. Training:

All workers have been trained using the EPA Worker Training Curriculum. The training was conducted by Joe Smith, a certified industrial hygienist with XYZ Industrial Hygiene, Inc., and Bill Smith, the competent person, on March 3-5,
1993.

Workers trained on March 3-5 include:

R. Smith

T. Jones

Z. Topp

J. Gonzales

The job proceeded as planned. However, in the next month, one worker's blood lead level increased from 12 to 25 μg/dl. This employee was one of the most productive members of the crew. The employer investigated the possible causes of the significant increase (10 μg/dl or more). After observing and interviewing the worker on a subsequent job, it was clear that the worker was not wearing the half-mask, air-purifying respirator all the time and was not using enough water to moisten surfaces before scraping. A powered air-purifying respirator was provided to increase the worker's understanding of the need for respiratory protection. Additional training and counseling by the physician was also provided to this individual. The following month's blood lead level declined to 16 μg/dl, but the supervisor continued to conduct special oversight of this individual.

Plan completed by:
_____(name)
_____(signature)
_____(date)

Check when completed

- ☐ Have workers who wear negative-pressure respirators medically evaluated to determine whether they can wear the respirator without damaging their health.
- ☐ Select and issue personal respirators for all workers exposed to lead paint dust, fumes and mist.
- ☐ Have workers who wear tight-fitting respirators fit-tested.
- ☐ Train workers to do a respirator seal check every time they put on a respirator.
- ☐ Train workers in respiratory protection issues as required by Cal/OSHA.

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701 Hannibal St.
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Fulton, NY 13069
(800) 543-2822

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Suite 500
Fort Worth, TX 76120
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Rancho Santa Margarita, CA 92688
(800) 337-2648

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Pittsburgh, PA 15220
(800) 441-9878

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DeWitt, MI 48820
(800) 526-2569

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Newburgh, NY 12550
(914) 565-8850

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Addison, IL 60101
(630) 627-6900

Nikro
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Villa Park, IL 60181
(630) 5304)558

Nilfisk of America Inc.
300 Technology Dr.
Malvern, PA 19355
(800) 645-3475

Pentek Inc.
1026 Fourth Ave.
Coraopolis, PA 15108
(412) 2624)725

Puilman-Holt
10702 N. 46th St.
Tampa, FL 33617
(813) 971-2223

Recyclean
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Milford, CT 06460
Phone: (203) 876-8065
Fax: (203) 876-1826

Specialty Vacuum Inc.
4533 Green Park Rd.
St. Louis, MO 63123
(314) 487-4600

Wap International
227 Old Hebron Rd.
Charlotte, NC 28273
(800) 237-2368

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Notes:

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I N V O I C E

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