



## CHAPTER 9

### SOIL ABATEMENT AND EXTERIOR DUST CLEANUP

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### Learning objectives

In this chapter you will learn

- why lead in soil is a health hazard
- what levels of lead in residential bare soil are considered hazards
- how lead exposure from soil can be controlled



**Removal and replacement of soil can be expensive.**

**Interim controls for soil-lead hazards include planting grass, laying sod, or using mulch.**

**A soil-lead hazard in bare soil is:**

- 400 ppm in a play area;
- average of 1,200 ppm in the rest of the yard.

## **Soil abatement and exterior dust cleanup**

Bare soil with high lead levels is a major health hazard, especially to children. Lead-contaminated soil could be a hazard because children may play in or near it, and dirt tracked into a home can lead to increased lead dust levels in the home. Government agencies used to recommend removing and replacing six to 24 inches of soil that contained high lead levels. However, studies have shown this process to be very costly and not to be a very effective way to reduce the blood lead levels of children living in these areas. Often, the best approach is to remove two to three inches, and then test the new lead levels of remaining soil. If the levels of lead are still high, more soil may need to be removed. Some states require abated soil to be tested to see if it is a hazardous waste.

If the soil has low levels of lead, the best method is to reduce access to the bare soil. This can be done by planting grass, laying sod, or covering the area with mulch. Activities such as these are called interim controls, because they are temporary methods of minimizing exposure to the lead in the soil.

Gardens grown in soil contaminated with lead can also be a health risk. Leafy vegetables and vegetables that grow under ground (such as carrots and potatoes) can absorb lead. These vegetables can then be eaten by people.

Soil abatement and exterior dust cleanup are considered together because they will likely occur together in abatement projects. Since soil abatement will tend to contaminate immediately adjacent paved areas, these paved areas should then be cleaned.

### **Soil-lead hazards**

A soil-lead hazard is present in bare residential soil:

- in a play area when the soil-lead concentration is equal to or greater than 400 parts per million;
- from the rest of the yard (i.e., non-play areas) when the average soil-lead concentration of samples collected is equal to or greater than 1,200 parts per million.

It is important to remember that your state/Indian tribe may establish different levels of lead in soil which are considered a soil-lead hazard. Your supervisor or employer is responsible for following the applicable standards!



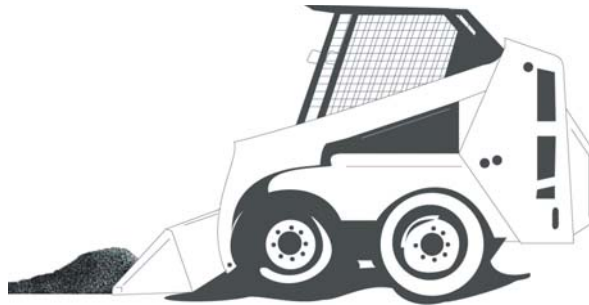
### Soil abatement

Lead-contaminated soil in residential areas can be treated in two main ways:

- abatement by
  - removing and replacing the contaminated soil with clean soil, or
  - permanently covering the contaminated soil with concrete or asphalt;
- interim controls such as
  - covering with several inches of clean soil or mulch, or planting sod or grass.

The depth of soil removed during an abatement project is an important issue. In projects where there are extremely hazardous materials or chemicals which may contaminate the ground water, all contaminated soil is generally removed or physically isolated at the site. Soil contaminated with less hazardous materials, such as lead from lead-based paint, may either be removed or partially removed and topped with “clean” soil.

Removal and replacement is the most common abatement strategy for lead-contaminated soil. Before beginning a soil removal project, make sure your supervisor has shown you where any buried utility lines are located. Your employer is required to find out if and where any buried cable, telephone, water, or electrical lines are located *before* you start digging.



Removal and replacement of soil in residential abatement situations may involve working in both large and small sites. Some urban yards are very small, consisting of only a few square yards in some cases. Other urban yards are larger but they are sometimes surrounded by buildings. Because of this, residential soil abatement will often require extensive hand labor in addition to mechanical soil removal. When soil is removed by hand, it can be loaded into wheelbarrows. The soil in the wheelbarrows must then be taken to other vehicles to be transported to the disposal site.





**Contaminated soil removed from a soil abatement project cannot be used as top soil at another residential property or child-occupied facility!**

EPA requires that if soil removal and replacement is done, then the replacement soil must have a lead concentration as close to the local soil background levels as possible, but cannot be more than 400 ppm lead. The soil that is removed cannot be used as top soil at another residential property or child-occupied facility. Your employer or supervisor is required to properly dispose of the contaminated soil.

Sometimes it is difficult to locate large amounts of soil with low enough levels of lead. In those situations, or in cases when removal and replacement is too costly, the lead-contaminated soil may be permanently covered by concrete or asphalt. Concrete or asphalt is an approved method of abatement for lead-contaminated soil.



### Exterior dust cleanup

Exterior dust cleanup would be more likely to occur alone, whereas, soil abatement is always followed by exterior dust cleanup. It could possibly be performed for a neighborhood area as part of a cleanup after an improper lead-based paint abatement in which a neighborhood was contaminated. This could result from a contractor or owner burning, sand blasting, or dry sanding lead-based paint from a structure. It could also be performed periodically where the exterior dust was contaminated by industrial or mining-related operations.

Exterior dust cleanup is an important abatement strategy because of the amount of lead in some street dust, and because contaminated dust is considered to be the primary exposure source. Just as children can be directly exposed to soil lead, they can also be exposed to exterior dust lead. Exterior dust can enter homes in several ways. Exterior dust lead concentrations over 100,000 ppm (equal to 10 percent lead in dust) have been measured in urban areas.

Cleaning up exterior dust consists of removing as much dust and dirt as possible from all paved surfaces within the abatement area. Lead-contaminated dust can be found on paved surfaces such as streets, street gutters, sidewalks, alleys, patios, and parking lots. The paved surfaces exist in a variety of materials. Commonly used paving materials are asphalt, concrete, and paving bricks. Surfaces such as old brick-paved alleys present the biggest challenge in removing street dust.

**Cleaning up exterior dust consists of removing as much dust and dirt as possible from all paved surfaces within the abatement area.**



### Key facts for Chapter 9

- High levels of lead in soil can be a major health hazard, especially to children.

Children may play in or near lead-contaminated soil and track it back into the home.

Pets can also track it into the home.

Gardens grown in lead-contaminated soil can also be a health risk.

- Soil-lead hazard levels are set by EPA or your state or Indian tribe.

A soil-lead hazard\* is present in bare soil:

- in a play area when the soil-lead concentration is equal to or greater than 400 parts per million;
- from the rest of the yard (i.e., non-play areas) when the average of samples collected is equal to or greater than 1,200 parts per million.

\* Your employer must check with the state or Indian Tribe in which the work is being done to see if they have set different soil-lead hazard levels.

- Lead-contaminated soil in residential areas can be treated in two main ways:

Abatement—either removal and replacement or covering the soil with concrete or asphalt.

- Replacement soil must have lead levels close to the local background levels, but not more than 400 ppm.
- Make sure all underground utilities have been marked *before* you dig!

Interim controls—laying sod, planting grass, and mulching.

- Exterior dust cleanup is usually done after soil abatement because soil abatement typically causes surrounding concrete areas to become contaminated.





### For more information

These publications have more information on the topics covered in this chapter. Your instructor has a copy of the publications marked with a star (\*). You can order your own copies by calling 1-800-424-LEAD.

\*EPA, *Lead: Identification of Dangerous Levels of Lead; Final Rule*; 40 CFR Part 745 (Jan 2001).

\*EPA, *Lead: Requirements for Lead-Based Paint Activities in Target Housing and Child-Occupied Facilities*; 40 CFR Part 745 (August 1996).

EPA, *Applicability of RCRA Disposal Requirements to Lead-Based Paint Abatement Wastes* (March 1993).

\*HUD, *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* (June 1995).

\*OSHA, *Interim Final Lead in Construction Standard*; 29 CFR 1926.62 (May 1993).

