

Arsenic and Lead Contamination in Oklahoma Soils

Arsenic and lead are naturally occurring elements present in rocks. As these rocks erode, arsenic and lead get in soils, waters and plants. The United States Geological Survey (USGS) reports an average of 7.4 parts per million (ppm) as the arsenic concentration in soils for the entire United States and 7.2 ppm as the average arsenic concentration in soils for the western U.S.⁽¹⁾ Background arsenic concentrations in Central Oklahoma soils range from 0.6 to 21 ppm.⁽²⁾ The USGS reports an average lead concentration of 13 parts per million (ppm) in soils for central Oklahoma⁽²⁾ and an average lead concentration of 18 ppm for the Western United States.⁽³⁾

Pollution from historic lead and zinc smelters in Oklahoma left residues of lead, arsenic and cadmium in area soils. Contamination was also spread by using smelter debris as fill material, driveways and roads. These former smelters were primarily located in eastern Oklahoma.

Some arsenic contamination above naturally occurring levels is also attributed to agricultural, energy and industrial practices. For example, arsenic-containing insecticides and herbicides were widely used on vegetables, fruits and field crops from the 1900s to around 1950. Coal combustion, wood preserving and smelting operations are known to be sources of arsenic contamination.⁽¹⁾

Lead was once commonly used in paint and in plumbing. Lead was an additive to gasoline for many years and has also been found in ceramics, mini-blinds and other products. Homes built before 1970 commonly have lead-based paint. Renovation activities and peeling or flaking paint can release lead inside the home. Identification and cleanup of lead-based paint and dust associated with lead-based paint in the home are the responsibility of the homeowner. The use of lead in products in the United States has been phased out over the years but it is still used in some industrial applications. It is not uncommon to find lead in urban settings from a variety of sources.

Lead can get into the body by swallowing lead-containing particles in paint, soil, dust, food or similar sources. The only way to detect lead exposure is to have a blood lead test. The Centers for Disease Control have set a level of concern for levels of lead in blood for children under 6 years old. The Oklahoma State Department of Health (OSDH) can provide information on the health effects of lead in children and how to have a child tested for lead. Contact the OSDH Oklahoma Childhood Lead Poisoning Prevention Program at (405) 271-6617.



Neither the Environmental Protection Agency (EPA) nor the Oklahoma Department of Environmental Quality (DEQ) have established regulatory cleanup levels for arsenic or lead in Oklahoma soils. The EPA, however, develops screening numbers for contaminants in soil, including arsenic and lead.⁽⁴⁾ These screening levels are concentrations that correspond to very low levels of risk. They are used as indicators of potential problems that generally require further investigation. Screening numbers are not the same as cleanup levels. EPA sets cleanup numbers based on site-specific modeling to protect human health.

For additional information, please contact DEQ's Land Protection Division at (405) 702-5100.

References:

1. Selenium, Fluorine, and Arsenic in Surficial Materials of the Conterminous United States. Geological Survey Circular 692, Geological Survey, United States Department of the Interior, 1974.
2. Elemental Composition of Surficial Materials from Central Oklahoma. USGS, Open File Report 91-442A. Mosier et al, 1991
3. USGS, 1975, Professional Paper 574, "Geochemistry of Some Rocks, Soils, Plants and Vegetables in the Conterminous United States."
4. EPA, Regional Screening Levels, 2018. <https://go.usa.gov/xETaS>

