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Arsenic and Historic Smelters in Oklahoma

This is one of a series of fact sheets that the Department of Environmental Quality (DEQ) is making available to provide information on the investigation and cleanup of the historical smelters in Oklahoma. This fact sheet will tell you about arsenic in soils.

Arsenic is a naturally occurring element that is present in rocks. As these rocks erode, arsenic gets in soils, waters and plants. Some arsenic contamination above naturally occurring levels is 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 a source of arsenic contamination. (1)

The historical smelters in Oklahoma are potential sources of lead, arsenic and cadmium in area soils. These metals can get into the soil from historical air emissions and from the use of residue and smelter debris as fill material, for driveways, and other uses.

The United States Geological Survey 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 concentrations of arsenic in soil in the region range from 1.1 ppm to 16 ppm. (2) Background arsenic concentrations in Central Oklahoma soils range from .6 to 21 ppm. (3)

There is no established regulatory cleanup level of arsenic in soils by the Environmental Protection Agency (EPA) or the DEQ in Oklahoma. However, the EPA develops screening numbers for contaminants in soil, including arsenic. 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 be protective of human health.

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. EPA Region VI Human Health Media Specific Screening Levels, 2007.
3. *Elemental Composition of Surficial Materials from Central Oklahoma*. USGS, Open File Report 91-442A. Mosier et al, 1991.



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