

A Proposed Approach to Regulating Contaminated Soil: Identify Safe Concentrations for Seven of the Most Frequently Encountered Exposure Scenarios¹

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Since 1980, more than 10,000 sites in the United States have been shown to contain soil which has elevated concentrations of various xenobiotics. Since that time, guidelines for deciding whether the level of contamination is worthy of concern have been proposed or promulgated by dozens of local, state, and federal regulatory agencies. Unfortunately, there has been little consistency in the guidelines suggested for each soil contaminant. For example, (a) the basis or rationale for some of the cleanup levels is unclear, (b) approaches to setting cleanup levels vary between states and agencies, (c) cleanup objectives often vary among agencies within the same state, and (d) the cleanup levels are usually set in a scientifically haphazard manner. This paper proposes that the most cost-effective and efficient way to quickly regulate contaminated soil is to establish "safe" concentrations for each chemical for the seven most common exposure scenarios. These exposure scenarios include (1) residential, (2) industrial, (3) agricultural, (4) recreational, (5) groundwater, (6) wildlife and aquatic species, and (7) runoff/erosion of particulates to waterways. The scientific approach and rationale for calculating the cleanup criteria are illustrated by evaluating dioxin and benzene, toluene, and xylene (BTX). The methods suggested here indicate that levels of dioxin of 25 and 50 ppb in residential and industrial soils, respectively, should be acceptable. The predominant concern for the agricultural and recreational scenarios is the runoff of particulates to waterways. For BTX, benzene will dictate the degree of cleanup and the primary hazard at most residential sites will be the inhalation of vapors. Benzene concentrations of 2.5, 14, and 250 ppm should be acceptable for residential, industrial, and recreational soils, respectively. Depending on the depth to groundwater and aquifer use, protection of groundwater may be the driving concern for establishing BTX cleanup levels and must be determined using site-specific factors.