

Setting Health-Protective Soil Concentrations for Dermal Contact Allergens: A Proposed Methodology

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Health-based cleanup goals for contaminated soils are typically established to protect potentially exposed individuals from increased incidences of cancer and serious noncancer effects. However, at least one regulatory agency has suggested that, for certain contact allergens such as hexavalent chromium, soil remedial goals should also consider the potential occurrence of allergic contact dermatitis (ACD) in sensitized individuals (NJDEPE, 1992). To date, appropriate risk assessment methods for setting ACD-based soil concentrations have not been addressed in the scientific literature. This paper defines and discusses the three key data needs for establishing ACD-based soil concentrations: (1) dose-response data from human patch-testing studies, in which the patch concentrations are reported in terms of mass of allergen per unit area of skin, (2) accurate estimates of the degree to which soil adheres to skin on a soil mass per unit area of skin basis, and (3) accurate estimates of the degree to which the allergen leaches from soil into human sweat. The requisite basis for each of these factors and suggested methods for obtaining and evaluating the necessary data are presented. In addition, two example calculations are presented for setting ACD-based goals for hexavalent and trivalent chromium in chromite ore-processing residues. © 1994