UCRL-JC-125634 Abs

Exposures to Soil Contaminants via Inhalation DAVID W. LAYTON (Lawrence Livermore National Laboratory, 7000 East Ave., Livermore, CA 94550)

A key component in the development of a risk-based cleanup limit for a contaminant in soil is the characterization of the mechanisms by which individuals are exposed to the contaminant via inhalation, ingestion, and dermal contact. For some contaminants inhalation is the most biologically significant route of exposure, and for such contaminants it is especially important to determine which parameters have the greatest influence on the magnitude of inhalation exposures. This paper examines inhalation-based exposure pathways to soil-derived contaminants at a residential site, discusses methods and data for assessing those exposures, and then provides an analysis of the various parameters influencing indoor and outdoor exposures to a soil contaminant. Exposure-related parameters addressed include the resuspension of particles outdoors, the tracking of soil into homes, the infiltration of particles through a building shell, and contaminant redistribution indoors by resuspension of particles from floors and deposition onto surfaces. Of special interest is the relationship between human activities, breathing rates, and the resuspension of dust particles during active and inactive periods at home. The origins of particles in different size classes in the indoor environment is another relevant topic that is addressed. The paper concludes with an analysis of the principal sources of variability in inhalation exposures to soil contaminants. Work performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under Contract W-7405-Eng-48.