

Comparing the Results of a Monte Carlo Analysis with EPA's Reasonable Maximum Exposed Individual (RMEI): A Case Study of a Former Wood Treatment Site

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In the United States, there are about 250 former sites that treated wood with preservatives that are now in need of some degree of remediation. The soil at many of these sites is contaminated with creosote, polycyclic aromatic hydrocarbons (PAHs), polychlorinated dibenzo-*p*-dioxins (PCDDs), and polychlorinated dibenzofurans (PCDFs). This paper compares the results of the current USEPA point estimate (deterministic) approach for predicting the health risks associated with exposure to PCDDs/PCDFs in soil with the results of a probabilistic approach which uses a Monte Carlo analysis. At many of these wood treatment sites the hazard posed by the PAHs, and especially pentachlorophenol, can be much greater than that due to PCDD and PCDFs; however, because at this site the health risk associated with PAHs was deemed negligible by ATSDR, only PCDDs/PCDFs were evaluated. Octachlorodibenzo-*p*-dioxin (OCDD) and octachlorodibenzofuran (OCDF) congeners were evaluated independently from the other congeners due to their prevalence in the environment and the availability of congener-specific data. The results of the reevaluation of the rodent bioassay data for 2,3,7,8-TCDD were considered in the probability distribution for the cancer potency factor. The authors' analyses indicate that when assessing exposure to soil via inhalation, ingestion, and dermal contact, the current regulatory approach used to estimate the reasonable maximally exposed individual (RMEI) (USEPA, *Risk Assessment Guidance for Superfund*, Vol. 1, Part A, 1989) can predict risks which are 10- to 100-fold greater than the 95th percentile risk predicted by a Monte Carlo analysis.