

## **RISK-BASED DECISION-MAKING FOR PESTICIDE SITE CLEANUP**

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### **Abstract**

Cleanup goals for contaminated sites are usually expressed as the average contaminant concentration, for different risk scenarios, below which the site must be cleaned to ensure satisfying the risk assumptions and protecting human health and the environment. The key word is “average.” If all soil with concentrations exceeding the target cleanup level is removed and replaced with clean soil, the resultant site risk level is lower than the intended objective.

A former pesticide formulation facility (Superfund Site) in Region 4 had an ROD imposing single, site-wide residential-risk cleanup target values. Surface soil concern was for ingestion and dermal contact pathways, and groundwater concern was based on beneficial use at a hypothetical down-gradient well. The subsurface soil driver had risk of pesticide mobility to the same groundwater receptor. A computer model incorporating contaminant fate and transport with site physical properties, and a comprehensive DQO-oriented sampling program was developed to enable iterative three-dimensional analysis of soil treatment options. By incrementally removing soil volumes until estimated concentrations at the groundwater receptor satisfied cleanup objectives, it showed residential scenario health protection could be achieved while reducing soil treatment volumes from 23,000 yards to 7,000 yards. This reduced cleanup costs by over \$3,000,000.

**Key words:** risk scenarios, computer modeling, cleanup objectives