



# **Risk-Based Guidance for the Soil-Human Health Pathway User's Guide**

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This document is designed to assist users in properly applying risk based guidance for evaluating the human health risk caused by exposure to contaminated soil at sites administered by the Superfund and Voluntary Investigation and Cleanup Programs (SF/VIC) of the Minnesota Pollution Control Agency (MPCA). The human exposure evaluation considers the risk posed by human contact with contaminated soil. Procedures are presented to estimate soil contaminant concentrations that must be addressed because they pose an unacceptable risk to human health. Soil contaminant-specific concentrations above which an unacceptable risk to human health is predicted to exist are referred to as Soil Reference Values (SRVs). The SRVs are derived by MPCA staff using risk assessment methodology, modeling, and risk management policy. It is imperative that users of this guidance understand the exposure scenarios and other assumptions that are incorporated into calculation of the SRVs, and have sufficient knowledge of the site to which they are being applied to evaluate the validity of the resulting soil-human health risk characterization. A risk characterization will be meaningful only when the SRVs are properly applied and any uncertainties are clearly identified. Additional technical support for the SRVs and more detailed guidance for conducting risk characterizations of the soil-human health exposure pathway can be found in the "Working Draft - Risk-Based Site Evaluation Guidance for Soil - Human Health-Based Exposure Pathways (Technical Support Document, September ??, 1998).

The tier-based approach to risk evaluation is based on the concept of incorporating progressively more site-specific information as the evaluation proceeds upward through the tiers. A Tier 1 evaluation is a screening level characterization of the soil-human health exposure pathway. It is assumed at Tier 1 that limited site-specific information is available; consequently, conservative assumptions are applied to assess whether an unacceptable risk may be present at a site that warrants additional investigation and/or evaluation. A Tier 1 risk characterization is generally accomplished by comparing maximum site soil contaminant concentrations directly to the Tier 1 SRVs. The Tier 1 SRVs are based on the assumption that human exposure to the contaminants is long term (chronic) and occurs in a residential site setting through a defined set of common exposure pathways. A residential exposure scenario is generally the most conservative human exposure scenario because people typically spend a greater portion of their lives living and sleeping in their homes than at their places of work or recreation, and therefore human exposure to any contaminants that may be present in a residential setting is proportionately greater. Contaminant concentrations that exceed acceptable risk limits should be further evaluated through additional site characterization and/or a Tier 2 risk characterization.

In a Tier 2 risk characterization, it is assumed that the areas of contamination are better characterized than at Tier 1 and that representative soil contaminant concentration(s) can be determined for the area(s) of concern with reasonable confidence. For Tier 2, SRVs were developed for human exposure scenarios based on industrial and recreational property use categories to enable the risk assessor to select the human exposure scenario that best fits the actual site use. When the representative site soil contaminant concentrations exceed the SRVs for the appropriate site use category, an unacceptable risk to human health is concluded to exist. In most cases, a remedy will be needed to reduce site risk to an acceptable level.

Sites that have potentially important exposure pathways or other conditions that are not incorporated into a Tier 1 or 2 risk characterization must be evaluated in Tier 3. A Tier 3 risk characterization is a fully site-specific risk assessment for which site-specific SRVs are calculated that account for all potentially significant exposure pathways and characteristics of the site. MPCA staff expect that only a trained risk assessor or other qualified professional will perform Tier 3 risk characterizations. Refer to the Technical Support Document for additional information about Tier 3 risk characterizations.

### **Draft Document Availability**

All draft guidelines are to be used with assistance from Minnesota Pollution Control Agency staff assigned to a specific site. Draft sections of the site evaluation manual will be available for public comment as they are completed. A photocopy fee of approximately \$0.20 per page will be charged for pages in excess of 20. To receive copies of the current and future documents or to be placed on a mailing list to receive notices regarding the guidance development efforts please send written requests to:

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Written comments regarding the guidelines may be sent to the *SRS Guidance Coordination Team* at the same address.