Monitored Natural Attenuation of Chlorinated Solvents in Ground Water

a Fact Sheet prepared by the Site Response Section
of the Minnesota Pollution Control Agency
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This document provides guidance on the selection of natural attenuation as a remedy for chlorinated solvents in ground water. Specifically, it describes a phased approval process that begins with a screening procedure. For those sites passing the screening criteria, additional site characterization, verification, and implementation steps are proposed that are meant to support the selection of a natural attenuation remedy.

The document emphasizes the subtle though important distinction between the intrinsic biodegradation of contaminants in ground water and the process of selecting natural attenuation as a remedy for a particular site. As defined in this document, "natural attenuation is the demonstration that intrinsic degradation will reduce the concentrations of the contaminants before they pose unacceptable levels of risk to human health or the environment, or exceed ground water criteria at established points of compliance". Therefore, it is critical that 1) a natural attenuation remedy not be confused as a "no action" alternative, and 2) a natural attenuation remedy be clearly demonstrated on a site-by-site basis.

The screening phase involves sampling monitoring wells at background locations and within the plume. Samples are analyzed for a range of specific organic and inorganic compounds that, in addition to field measurements, indicate whether the oxidation/reduction status of the groundwater is favorable to the biodegradation of the contaminant. Preliminary modeling, including assumed biodegradation rates, provides a rapid means to determine whether natural attenuation is a promising remedy for the site.

The second phase consists of a detailed site characterization that is analogous to a feasibility study. It includes refining site specific biodegradation rates, obtaining hydrogeological data, lithology, plume definitions, exposure pathways, and distances to receptors of the ground water. Contour maps of contaminant concentrations, electron acceptors, and ground water elevations are developed. Fate-and-transport modeling refines predictions about plume dynamics over time.

Implementation of the remedy includes the placement of "sentry" wells between the plume edge and exposure points, establishing a long term sampling plan, and drawing up contingency plans in the event of unforeseen plume expansion.

The guidance includes brief technical discussions where needed to clarify certain points, cites references in support of major concepts, and provides some biodegradation rate data helpful in the screening stages of the remedy.

Draft Document Availability

Individual sections of the RBSE Manual are being released to the public in draft form for comment as they become available. Guidelines to be released include ground water policy, site characterization and sampling requirements, remedy selection, and evaluation of soil to ground water leaching. All draft guidelines are to be used with assistance from Minnesota Pollution Control Agency staff assigned to a specific site.

A photocopy fee of approximately $0.20 per page will be charged for draft sections of the RBSE Manual in excess of 20 pages. 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.