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Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA

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any known ecological effect such as acute or chronic toxicity or bioaccumulation in the food chain.

Once the available data have been collected, they are analyzed to (1) establish the physical characteristics of a site to help determine the scope of future sampling efforts; and (2) conceptually model potential exposure pathways and receptors to assist in the preliminary assessment of risk and the initial identification of potential remedial technologies. Each of these uses is discussed below.

2.2.2.1 Establish Physical Characteristics of the Site

The analysis of existing data serves to provide a better understanding of the nature and extent of contamination and aids in the design of remedial investigation tasks. If quality assurance information on existing sampling data is available, it should be reviewed to assess the level of uncertainty associated with the data. This is important to establish whether sampling will be needed to verify or simply supplement existing data. Important factors to consider when reviewing existing data are the comparability of the data (e.g., time of sampling), the analytical methods, the detection limits, the analytical laboratories, and the sample collection and handling methods.[4]

Existing data should be used to develop a site description, which should include location, ownership, topography, geology, land use, waste type, estimates of waste volume, and other pertinent details. The site description should also include a chronology of significant events such as chemical storage and disposal practices, previous site visits, sampling events, regulatory violations, legal actions, and changes in ownership. In addition, information concerning previous cleanup actions, such as removal of containerized waste, is often valuable for determining the characteristics of any wastes or contaminated media remaining at the site. All sources of information or data should be summarized in a technical memorandum or retained for inclusion in the RI report.

2.2.2.2 Develop a Conceptual Site Model

Information on the waste sources, pathways, and receptors at a site is used to develop a conceptual understanding of the site to evaluate potential risks to human health and the environment. The conceptual site model should include known and suspected sources of contamination, types of contaminants and affected media, known and potential routes of migration, and known or potential human and environmental receptors. This effort, in addition to assisting in identifying locations where sampling is necessary, will also assist in the identification of potential remedial technologies. Additional information for evaluating exposure concerns through the use of a conceptual model is provided in the *DQO Guidance*. An example of a conceptual model is provided in Figure 2-2.

2.2.2.3 Determine the Need for and Implement Limited Additional Studies

If the conceptual understanding of a site is poor and the collection of site-specific data would greatly enhance the scoping effort, a limited field investigation may be undertaken as an interim scoping task prior to developing the work plan.[5] Normally, the investigation is limited to easily obtainable data, where results can be achieved in a short time. Examples of tasks are as follows:

- Preliminary geophysical investigations
- Residential, industrial, and agricultural well sampling and analysis
- Measurement of well-water level, sampling (only for pre-existing monitoring wells), and analysis
- Limited sampling to determine the need for waste treatability studies
- Air monitoring
- Site mapping
- Preliminary ecological reconnaissance

2.2.3 *Develop Preliminary Remedial Action Alternatives*

Once the existing site information has been analyzed and a conceptual understanding of the site is obtained, potential remedial action objectives should be identified for each contaminated medium (Chapter 4 presents examples of remedial action objectives) and a preliminary range of remedial action alternatives and associated technologies should be identified. This identification is not meant to be a detailed investigation of alternatives. Rather, it is intended to be a more general classification of potential remedial actions based upon the initially identified potential routes of exposure and associated receptors. The identification of potential technologies at this stage will help ensure that data needed to evaluate them (e.g.,

[4] Regardless of the origin and quality of existing data, they typically are useful in constructing hypotheses concerning the nature and extent of contamination.

[5] The specific procedures for initiating limited field investigation will be dependent on the lead agency's administrative and contractual requirements.