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Expedited Site Assessment Tools For Underground Storage Tank Sites

A Guide For Regulators

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Chapter I

Introduction

Introduction

The U.S. Environmental Protection Agency's Office of Underground Storage Tanks (OUST) encourages the use of expedited site assessments (ESAs) as a way to streamline the corrective action process, improve data collection, and reduce the overall cost of remediation. The implementation of ESAs is especially important as many owners and operators of underground storage tanks (UST) facilities comply with the December 22, 1998 regulatory deadline for upgrading, replacing, or closing their USTs. As of March 1997, OUST has estimated that of the 1.1 million federally regulated USTs, between 400,000 and 500,000 meet the 1998 regulatory standards. The process of complying with these standards may result in the closure of about 300,000 USTs and the identification of 100,000 additional releases. Each of these sites will require an assessment. Furthermore, of the 317,000 releases confirmed since December 1988, about 64,000 still need to initiate cleanup activities. As a result, at least 360,000 sites are likely to require site assessments in the next few years.

As the first step in the overall corrective action process, the site assessment process is critical to making appropriate corrective action decisions. When site assessments are complete, they provide accurate information about the presence and distribution of contaminants, thereby facilitating cost-effective and efficient remediation. When they are incomplete, they can provide inaccurate or misleading information which can delay effective remediation, increase overall corrective action costs, and, result in an increased risk to human health and the environment. By nature, there are always gaps in the information provided in site assessments. It is, therefore, not always obvious when a site assessment is complete and when the information has been accurately interpreted. As a result, a tremendous amount of data is needed to determine where contaminants are located and how best to remediate them.

Site assessments can also contribute directly to a large percentage of the overall corrective action costs. Sampling equipment, sample analysis, and labor hours may cost between 10 and 50 percent of the total remediation costs at petroleum-contaminated sites. When investigators and regulators have determined that remediation by natural attenuation is appropriate, the site assessment may encompass an even higher percentage of remediation costs.

In many cases, regulators do not directly oversee site assessments and do not select specific site assessment equipment. Regulators do, however, have tremendous influence over the site assessment process in their jurisdictions through their issuance of regulations and guidance and by their acceptance of certain kinds of data for regulatory decisions.

With the emergence of an enormous number of new site assessment tools recently, regulators are ofien hard pressed to keep current with the latest technologies and maintain their other duties of reviewing site assessments, evaluating corrective action plans, and/or issuing regulations. There is, therefore, a need for a document that evaluates site assessment methods and tools for regulators. This *guide* addresses the overall ESA process as well as specific site assessment tools and methods. Topics include:

- The ESA process;
- Surface geophysical methods;
- Soil-gas surveys;
- Direct push technologies; and
- Field methods for the analysis of petroleum hydrocarbons.

Purpose

The purpose of this *guide* is to provide federal, state, and local regulators with information that will help them to evaluate new as well as conventional site assessment technologies, develop their own guidance documents, and promote the use of ES As. The *guide* does not advocate the use of one technology over another; rather it focuses on appropriate technology use, taking into consideration site-specific conditions.

The *guide* is designed to enable the reader to answer the following basic questions about expedited site assessments at UST facilities:

- What is an ESA?
- How is an ESA conducted?
- What equipment can be used in an ESA?
- Under what site conditions are specific site assessment tools appropriate?

Scope And Limitation

This *guide* does not represent the issuance of formal policy or in any way affect the interpretation of federal regulations. The text focuses on scientific and practical considerations for evaluating various types of technologies used to assess UST sites. It does not provide instructions on the use of any specific tool and does not supersede or replace equipment manufacturer instructions. Although, this *guide* may be used by state and local agencies in the development of guidance documents, it should not be interpreted as providing guidance on securing permits, health and safety regulations, or state-specific requirements.

The material presented is based on available technical data and information as well as the knowledge and experience of the authors and peer reviewers.

How To Use This Guide

EPA's OUST encourages you to use this *guide* at your desk or in the field as you review, oversee, or manage site assessments. We have designed the *guide* so that you can tailor it to meet your own needs. The three-hole punch format allows you to place the *guide* in a binder with additional material *(e.g.*, state-specific information, guidance documents, journal articles, equipment literature) and remove certain tools *(e.g.*, summary tables) for photocopying. The wide margins were provided to enable you to add your own notes to the text.

In addition to this chapter, the *guide* contains five chapters--each addresses a major consideration necessary for promoting and conducting expedited site assessments.

Chapter II *The Expedited Site Assessment Process.* This chapter presents an overview of the steps involved in an expedited site assessment, explains how site assessment equipment can be used to expedite the process, and makes comparisons with conventional site assessments.

Chapter III *Surface Geophysical Methods.* This chapter describes the six surface geophysical methods that are most often appropriate at UST facilities and discusses their effectiveness as compared with other methods.

Chapter IV *Soil-Gas Surveys.* This chapter provides a comparison of active and passive soil-gas surveying methods and discusses their applicability.

Chapter V *Direct Push Technologies.* This chapter discusses direct push rod systems, sampling equipment, specialized probes, methods for advancing rods, and methods for sealing direct push holes. Each section explains the applications of all the discribed equipment.

Chapter VI *Field Methods For The Analysis Of Petroleum Hydrocarbons.* This chapter discusses the eight most appropriate field analytical methods, including the applicability and limitations of each method.

The discussion in each chapter contains illustrations, comparative tables, and references. For the readers convenience, a list of manufactures are presented at the end of relevant chapters. At the end of each chapter are lists of references and peer reviews. At the end of the *guide* are two appendices. Appendix A covers data requirements for corrective action evaluations, and Appendix B is a table of U.S. EPA test methods for petroleum hydrocarbons. The appendices are followed by a list of abbreviations, and a glossary of relevant terms. Throughout this *guide,* discussions of specific equipment are presented in generic terms so as to not advocate any product of any specific manufacturer.