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Standard Guide for Developing and Implementing Interim and Early Actions for Waste Contamination Site Remediation¹

This standard is issued under the fixed designation D5745; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope*

1.1 The purpose of this guide is to assist practitioners in the development, selection, design, and implementation of interim, short-term, or early action remedies undertaken at sites of waste contamination for the purpose of managing, controlling, or reducing risk posed by environmental site contamination. Early action remedies and strategies are applicable to the management of other regulatory processes (for example, state underground storage tank (UST) programs are equally applicable) in addition to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)/National Oil and Hazardous Substances Pollution Contingency Plan (NCP) process. This guide identifies and describes a standard process, technical requirements, information needs, benefits, and strategy for early actions.

1.2 This guide is applicable to both nonhazardous and hazardous sites of contamination as defined by CERCLA as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and the Resource Conservation and Recovery Act (RCRA) as amended by the Hazardous and Solid Waste Amendments (HSWA) of 1986.

1.3 To the extent that this guide may be used for hazardous materials operations, it does not address the applicability of regulatory limitations and local requirements.

1.4 *This guide offers an organized collection of information or a series of options and does not recommend a specific course of action. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this guide may be applicable in all circumstances. This ASTM standard is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this document be applied without consideration of a project's many unique aspects. The word "Standard" in the title of this document means only that the document has been approved through the ASTM consensus process.*

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

- D653 Terminology Relating to Soil, Rock, and Contained Fluids
- D3740 Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
- D6235 Practice for Expedited Site Characterization of Vadose Zone and Groundwater Contamination at Hazardous Waste Contaminated Sites
- E1689 Guide for Developing Conceptual Site Models for Contaminated Sites
- E1739 Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites
- E2081 Guide for Risk-Based Corrective Action
- E2616 Guide for Remedy Selection Integrating Risk-Based Corrective Action and Non-Risk Considerations

2.2 USEPA Documents Available from United States Environmental Protection Agency (EPA), William Jefferson Clinton Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460, <http://www.epa.gov>.

Guidance for Performing Preliminary Assessments under CERCLA, September 1991, EPA/9345.0-01A

Guidance for Performing Site Inspections under CERCLA, September 1992, EPA/9345.1-05

¹ This guide is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.21 on Groundwater and Vadose Zone Investigations.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

*A Summary of Changes section appears at the end of this standard

Data Quality Objectives for Remedial Response Activities: Development Process, EPA/540/G-87/003

RCRA Corrective Action Interim Measures Guidance, Interim Final, June 1988, EPA/9902.4

RCRA Corrective Action Plan (Final), May 1994, EPA/9902.3-2A

3. Terminology

3.1 *Definitions*—For definitions of common technical terms in this standard, refer to Terminology **D653**.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *applicable or relevant and appropriate requirements (ARAR)*—those requirements, cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that show either a direct correspondence or address problems or situations sufficiently similar at a site to show that they are well suited for application.

3.2.2 *conceptual site model (CSM), n*—a written or pictorial representation of the physical system and the iterative characterization of the physical and chemical processes and conditions that affect the transport of contaminants from sources through environmental media to receptors or potential receptors (see Guide **E1689**).

3.2.3 *contaminant, n*—any substance potentially hazardous to human health or the environment present in the environmental media of concern, and for which there exist regulatory limits.

3.2.4 *early action, n*—a remedial plan initiated in advance of a complete or final characterization of a contaminated site.

3.2.5 *final remedy, n*—complete site restoration.

3.2.6 *interim action, n*—a remedial action that implements a partial solution prior to the selection of a final remedy.

3.2.7 *migration, n*—the movement of contaminant(s) away from a source through permeable subsurface media (such as the movement of a groundwater plume of contamination) or the movement of contaminant(s) by a combination of surficial and subsurface processes.

3.2.8 *potential migration pathway, n*—the route that may be taken by contaminants in the environment as they move or are transported from the source(s), usually in a downgradient direction.

3.2.9 *receptor, n*—humans or other species potentially at risk from exposure to contaminant(s) at the point(s) of exposure.

3.2.10 *release, n*—any spilling, leaking, pumping, emitting, emptying, discharging, injecting, escaping, leaching, dumping, and disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles) of any hazardous substance.

3.2.11 *removal, n*—immediate, short-term measures intended to protect people from immediate threats posed by contaminants.

3.2.11.1 *Discussion*—Examples are handling, transport, and off-site disposal of sources or potential sources.

3.2.12 *size characterization, n*—the process by which information relating to the nature, extent, potential migration pathways, and receptors of environmental contaminants is gathered, interpreted, and documented.

3.2.12.1 *Discussion*—Site characterization efforts to provide a basis for the following: (1) the development of a conceptual site model (CSM), (2) the selection and design of a site remediation plan, or (3) the measuring point against which the effectiveness of a remedy can be evaluated, or some combination thereof (see Practice **D6235**).

3.2.13 *site remediation, n*—those actions taken in the event of a release or threatened release of a hazardous substance into the environment, to prevent or minimize the impact of the release, or to mitigate a substantial hazard to present or future environmental conditions.

3.2.13.1 *Discussion*—This early action may or may not lead to ultimate restoration of the site.

3.2.14 *source, n*—the location at which contamination has entered the natural environment.

4. Summary of Guide

4.1 The basic activities associated with implementing an interim or early action are as follows: (1) construction of a CSM and estimation of risk(s); (2) identification of exposure control pathways amenable to engineered control; (3) development of partial solutions, estimation of engineered risk, and identification and negotiation of required action levels; (4) selection of the desired solution(s); (5) attainment of legal authority for implementation of the planned solution(s); (6) design and execution of the selected solution(s); and (7) post-implementation monitoring of the conceptual site model.

4.2 Five common objectives for an early action are to achieve the following: (1) minimize the human or environmental risk exposure, or both; (2) minimize the time required to implement a final remedy; (3) protect resources (for example, financial, mineral, and ecological); (4) minimize the complexity of a final remedy; or (5) provide a solution-oriented project focus, or combination thereof.

4.3 There are three basic types of interim or early action remedies: (1) source control remedies, (2) pathway control remedies, and (3) receptor control remedies. Early actions are commonly categorized as source or receptor control since pathway controls usually require a sophisticated understanding of the conceptual site model dynamics.

NOTE 1—Some examples of interim and early action remedies include: fences; site access controls; warning signs; physical security; covers; barriers; underground barrier walls; drainage controls; runoff diversion barriers; berms; dikes; impoundment areas; capping; neutralizing chemicals; removal of debris; removal of drums, tanks, containers; removal of soil or solid materials; removal of liquids; in-situ treatments; bioremediation; alternate water treatment process; provision of alternate potable water sources or supplies; and provision of alternate habitat.

4.4 The development of a final remedy is often an iterative process that evolves frequently with the compilation of new data in the CSM. Prompt development and implementation of early actions increases attainment of a project's remediation objectives.