



Standard Practice for Expedited Site Characterization of Vadose Zone and Ground Water Contamination at Hazardous Waste Contaminated Sites¹

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1. Scope

1.1 *Applicability of the ECS Process*—This practice covers a process for expedited site characterization (ESC) of hazardous waste contaminated sites² to identify vadose zone, ground water and other relevant contaminant migration pathways and determine the distribution, concentration, and fate of contaminants for the purpose of providing an ESC client, regulatory authority, and stakeholders with the necessary information to choose a course of action.³ Generally, the process is applicable to larger-scale projects, such as CERCLA (Superfund) remedial investigations and RCRA facility investigations.⁴ When used as part of the Superfund response process, this Practice should be used in conjunction with U.S. EPA's guidance document titled *Using Dynamic Field Activities for On-Site Decision Making: A Guide for Project Managers* (37). The ESC process is also applicable to other contaminated sites where the ESC process can be reasonably expected to reduce the time and cost of site characterization compared to alternative approaches. The ESC process has been applied successfully at a variety of sites in different states and EPA regions. (See Table X1.1). It typically achieves significant cost and schedule savings compared to traditional site characterization. (See X1.2 and X1.3)⁵.

¹ This practice is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.01 on Surface and Subsurface Characterization.

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² The term hazardous waste in the title is used descriptively. The term also has specific meanings in the context of different regulatory programs. Expedited site characterization is also appropriate for radiologically contaminated sites and some larger petroleum release sites, such as refineries. Section 4.2 further identifies types of contaminated sites where ESC may be appropriate. See Appendix X1 for additional background on the ESC process.

³ The text of this practice emphasizes vadose zone and ground water contamination because these contaminant migration pathways are the most difficult to characterize. An ESC project should also address all other relevant contaminant migration pathways, such as air, surface water, submerged sediments, and biota.

⁴ A CERCLA preliminary assessment/site inspections (PA/SI) or a RCRA facility assessment (RFA) is generally required to provide information supporting a decision to initiate the ESC process. (See Appendix X2).

⁵ This practice uses the term “traditional” site characterization to refer to the approach that has typically been used for characterizing contaminated sites at CERCLA and RCRA sites during the 1980s and early 1990s.

1.2 *Features of the ESC Process*—The ESC process operates within the framework of existing regulatory programs. It focuses on collecting only the information required to meet characterization objectives and on ensuring that characterization ceases as soon as the objectives are met. Central to the ESC process is the use of judgement-based sampling and measurement to characterize vadose zone and ground water contamination in a limited number of field mobilizations by an integrated multidisciplinary team, led by a technical leader and operating within the framework of a dynamic work plan that gives him or her the flexibility of responsibility to select the type and location of measurements needed to optimize data collection activities. Table 1 identifies other essential features of the ESC process, and Fig. 1 presents a flow diagram for the entire ESC process.

1.3 *Investigation Methods*—The process described in this practice is based on good scientific practice but is not tied to any particular regulatory program, site investigation method or technique, chemical analysis method, statistical analysis method, risk analysis method, or computer modeling code. Appropriate investigation techniques in an ESC project are highly site specific and are selected and modified based upon the professional judgement of the core technical team (in particular the technical team leader). Whenever feasible, non-invasive and minimally invasive methods are used, as discussed in Appendix X3. Appropriate chemical analysis methods are equally site specific. Analyses may be conducted in the field or laboratory, depending on data quality requirements, required turnaround time, and costs.

1.4 *Sites Generally Not Appropriate for the ESC Process*—Generally, the ESC process is not applicable to: small petroleum release sites, real estate property transactions that require no more than a Phase I ESA, sites where contamination is limited to the near surface or there is no basis for suspecting that contaminant movement through the vadose zone and ground water is a matter of concern, sites where the cost of remedial action is likely to be less than the cost of site