



## Standard Practice for Minimum Set of Data Elements to Identify a Soil Sampling Site<sup>1</sup>

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<sup>ε1</sup> NOTE—A units statement was added and the designation was revised editorially in August 2010.

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### 1. Scope

1.1 This practice covers what information should be obtained to uniquely identify any soil sampling or examination site where an absolute and recoverable location is necessary for quality control of the study, such as a waste disposal project. The minimum set of data elements for sampling site identification (DEFSSI) was developed considering the needs for informational data bases, such as geographic information systems (GIS). Other distinguishing details, such as individual site characteristics help in singularly cataloging the site. For studies that are not environmentally regulated, such as for an agricultural or preconstruction survey, the data specifications established an agency or company may be different from that of the minimum set (see Guide **D420** and Practice **D5254**).

1.2 As used in this practice, a soil sampling site is meant to be a single point, not a geographic area or property, located by an X, Y, and Z coordinate position at land surface or a fixed datum. All soil data collected for the site are directly related to the coordinate position, for example, sample from  $x$  feet (or metres) or sample from interval  $x^1$  to  $x^2$  ft (or metres) below the X, Y, and Z coordinate position. A soil sampling site can include a test well, augered or bored hole, excavation, grab sample, test pit, sidewall sample, stream bed, or any other site where samples of the soil can be collected or examined for the purpose intended.

1.3 The collection of soil samples is a disruptive procedure as the material is usually extracted from its natural environment and then transported from the site to a laboratory for analysis. Normally, in this highly variable type of material, the adjacent soil profile will not be precisely the same as the sampled soil. For these reasons, when soil samples are removed the same material cannot be collected from the site

later. Therefore, it is essential that the minimum set of DEFSSI be thoroughly documented and identified especially with an accurate location.

1.4 Samples of soil (sediment) filtered from the water of streams, rivers, or lakes are not in the scope of this practice.

NOTE 1—There are many additional data elements that may be necessary to identify and to describe a soil sampling site, but are not included in the minimum set of data elements. An agency or company may require additional data elements as a part of their minimum set for a specific project or program.

1.5 The values stated in either SI units or inch-pound units [presented in brackets] are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.5.1 The gravitational system of inch-pound units is used when dealing with inch-pound units. In this system, the pound (lbf) represents a unit of force (weight), while the unit for mass is slugs. The rationalized slug unit is not given, unless dynamic ( $F = ma$ ) calculations are involved.

1.6 This practice includes those data elements that will distinguish a site's geographical location on Earth, its location by political regimes, its source identifiers, and its individual site characteristics. These elements apply to all soil and geotechnical sampling sites involved in environmental assessment studies. Each category of site, such as a bore hole or excavation, may require additional data elements to be complete.

1.7 Some suggested components and representative codes for coded DEFSSI, for example, "setting", are those established by Ref (1),<sup>2</sup> by Practice **D2487**, by the Water Resources Division of the U.S. Geological Survey in Ref (2), and by Boulding in Ref (3) and (4).

NOTE 2—The data elements presented in this practice do not uniquely imply a computer data base, but the minimum set of soil data elements that

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<sup>2</sup> The boldface numbers given in parentheses refer to a list of references at the end of the text.

should be collected for entry into any type of permanent file.

1.8 *This practice offers a set of instructions for performing one or more specific operations. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this practice 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.*

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>3</sup>

**D420** Guide to Site Characterization for Engineering Design and Construction Purposes (Withdrawn 2011)<sup>4</sup>

**D653** Terminology Relating to Soil, Rock, and Contained Fluids

**D2487** Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

**D2488** Practice for Description and Identification of Soils (Visual-Manual Procedure)

**D3740** Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

**D5254** Practice for Minimum Set of Data Elements to Identify a Ground-Water Site

## 3. Terminology

### 3.1 Definitions of Terms Specific to This Standard:

3.1.1 "Soils" are sediments or other unconsolidated solid particles of rock produced by the physical and chemical disintegration of rock, and which may or may not contain organic matter (see Terminology **D653**).

3.1.2 *Discussion*—Soil consists of any individual or combination of gravel (passes a 75-mm or [3-in.] screen), sand, clay, silt, organic clay, organic silt, and peat as categorized in the Unified Soil Classification System (1, 2, 4, 5) (see Practices **D2487** and **D2488**). Materials larger than gravel, including cobbles (between 75 and 300 mm or [3 and 12 in.]) and boulders (more than 300 mm or [12 in.]), are not included in the definition of soil. Soil is found above the consolidated rocks and can be unsaturated (vadose zone) or saturated (capillary fringe and water table) with water or other liquids.

NOTE 3—Soil, as defined by geotechnical engineers, is all unconsolidated material above bedrock (**5**); or the natural medium for growth of land plants (**6**). The pedologic definition is, the unconsolidated mineral or organic matter on the surface of the earth subjected to and influenced by genic and environmental factors of: parent material, climate (including water and effects), macro- and micro-organisms, and topography, all acting over a period of time and producing a product-soil-that differs from material from which it is derived in many physical, chemical, biological,

and morphological properties and characteristics (**7**).

3.2 "Sediment" (for geology) is a mass of organic or inorganic solid fragmented material, or the solid fragment itself, which comes from weathering of rock and is carried by, suspended in, or dropped by air, water, or ice; or a mass accumulated by any other natural agent and that forms in layers on the Earth's surface such as sand, gravel, silt, mud, till, or loess (**5,8**). These materials are "soils" for the purpose of this practice.

3.3 "Soil Sampling Site" is meant to be a single point, not a geographic area or property, located by an X, Y, and Z coordinate position at land surface or a fixed datum (see **1.2** for additional explanation).

3.4 "Date of First Record for Soil Sampling Site" is the date that the first valid transaction occurred for any element of the specified site. This could be the date of a permit application or start of construction. This element is important to facilitate the proper identification of the record.

## 4. Summary of Practice

4.1 This practice includes the following DEFSSI to identify a subsurface soil site:

### 4.1.1 Geographic Location:

4.1.1.1 Latitude,

4.1.1.2 Longitude,

4.1.1.3 Coordinate precision,

4.1.1.4 Altitude, and

4.1.1.5 Altitude precision.

### 4.1.2 Political Regime Location:

4.1.2.1 State or country identification, and

4.1.2.2 County or county equivalent.

### 4.1.3 Source Identifiers:

4.1.3.1 Project identification,

4.1.3.2 Owner's name,

4.1.3.3 Source agency or company and address,

4.1.3.4 Unique identification, and

4.1.3.5 Date of first record for the soil sampling site.

### 4.1.4 Individual Site Characteristics:

4.1.4.1 Setting,

4.1.4.2 Type of soil sampling site,

4.1.4.3 Use of site, and

4.1.4.4 Reason for data collection or examination.

## 5. Significance and Use

5.1 Normally, the basic soil data are gathered by trained personnel during the field investigation phase of a study. Each agency or company has its own methods of obtaining, recording, and storing the information. Usually, these data are recorded onto forms that serve both in organizing the information in the field and the office, and often as entry forms for a computer data base. For soil data to be of maximum value to the current project and any future studies, especially those involved in the assessment of the environment, it is essential that a minimum set of key identification data elements be recorded for each sampling site.

5.2 When obtaining basic data concerning a subsurface soil sampling site, it is necessary to thoroughly identify that

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>4</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).