



Standard Guide for Pore-Liquid Sampling from the Vadose Zone¹

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1. Scope

1.1 This guide covers the equipment and procedures used for sampling pore-liquid from the vadose zone (unsaturated zone). The guide is limited to in situ techniques and does not include soil core collection and extraction methods for obtaining samples.

1.2 The term “pore-liquid” is applicable to any liquid from aqueous pore-liquid to oil. However, all of the samplers described in this guide were designed, and are used to sample aqueous pore-liquids only. The abilities of these samplers to collect other pore-liquids may be quite different than those described.

1.3 Some of the samplers described in this guide are not currently commercially available. These samplers are presented because they may have been available in the past, and may be encountered at sites with established vadose zone monitoring programs. In addition, some of these designs are particularly suited to specific situations. If needed, these samplers could be fabricated.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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 and health practices and determine the applicability of regulatory limitations prior to use.*

1.6 *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.

2. Referenced Documents

2.1 ASTM Standards:²

D653 Terminology Relating to Soil, Rock, and Contained Fluids

3. Terminology

3.1 *Definitions*—Where reasonable, precise terms and names have been used within this guide. However, certain terms and names with varying definitions are ubiquitous within the literature and industry of vadose zone monitoring. For purposes of recognition, these terms and names have been included in the guide with their most common usage. In these instances, the common definitions have been included in **Appendix X1**. Examples of such terms are soil, lysimeter, vacuum and pore-liquid tension.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 **Appendix X1** is a compilation of those terms used in this guide. More comprehensive compilations, that were used as sources for **Appendix X1**, are (in decreasing order of their usage):

3.2.1.1 Terminology **D653**,

3.2.1.2 *Compilation of ASTM Terminology*,³

3.2.1.3 *Glossary of Soil Science Terms*, Soil Science Society of America,⁴ and,

3.2.1.4 *Webster's New Collegiate Dictionary*,⁵

4. Summary of Guide

4.1 Pores in the vadose zone can be saturated or unsaturated. Some samplers are designed to extract liquids from unsaturated pores; others are designed to obtain samples from saturated

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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.

³ *Compilation of ASTM Terminology*, Sixth edition, ASTM, 1916 Race Street, Philadelphia, PA 19103, 1986. (Currently, *ASTM Dictionary of Engineering Science & Technology*, 10th edition, ASTM International, 2005.)

⁴ *Glossary of Soil Science Terms*, Soil Science Society of America, 1987.

⁵ *Webster's New Collegiate Dictionary*, Fifth edition, 1977. (Currently *Merriam-Webster's Collegiate Dictionary*, Eleventh edition, 2006.)