



Standard Guide for Selection of Aquifer Test Method in Determining Hydraulic Properties by Well Techniques¹

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^{ε1} NOTE—Section 1.5 was added editorially in January 1999.

1. Scope

1.1 This guide is an integral part of a series of standards that are being prepared on the in situ determination of hydraulic properties of aquifer systems by single- or multiple-well tests. This guide provides guidance for development of a conceptual model of a field site and selection of an analytical test method for determination of hydraulic properties. This guide does not establish a fixed procedure for determination of hydrologic properties.

1.2 The values stated in SI units are to be regarded as standard.

1.3 *Limitations*—Well techniques have limitations in the determination of hydraulic properties of ground-water flow systems. These limitations are related primarily to the simplifying assumptions that are implicit in each test method. The response of an aquifer system to stress is not unique; therefore, the system must be known sufficiently to select the proper analytical method.

1.4 *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.*

1.5 *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:

- D 653 Terminology Relating to Soil, Rock, and Contained Fluids²
- D 4044 Test Method (Field Procedure) for Instantaneous Change in Head (Slug Tests) for Determining Hydraulic Properties of Aquifers²
- D 4050 Test Method (Field Procedure) for Withdrawal and Injection Well Tests for Determining Hydraulic Properties of Aquifer Systems²
- D 4104 Test Method (Analytical Procedure) for Determining Transmissivity of Nonleaky Confined Aquifers by Overdamped Well Response to Instantaneous Change in Head (Slug Test)²
- D 4105 Test Method (Analytical Procedure) for Determining Transmissivity and Storage Coefficient of Nonleaky Confined Aquifers by the Modified Theis Nonequilibrium Method²
- D 4106 Test Method (Analytical Procedure) for Determining Transmissivity and Storage Coefficient of Nonleaky Confined Aquifers by the Theis Nonequilibrium Method²
- D 4630 Test Method for Determining Transmissivity and Storativity of Low-Permeability Rocks by In Situ Measurements Using the Constant Head Injection Test²
- D 4631 Test Method for Determining Transmissivity and Storativity of Low Permeability Rocks by In Situ Measurements Using the Pressure Pulse Technique²
- D 5269 Test Method (Analytical Procedure) for Determining Transmissivity of Nonleaky Confined Aquifers by the Theis Recovery Method³
- D 5270 Test Method (Analytical Procedure) for Determining Transmissivity and Storage Coefficient of Bounded, Nonleaky, Confined Aquifers³
- D 5472 Test Method for Determining Specific Capacity and Estimating Transmissivity at the Control Well³
- D 5473 Test Method (Analytical Procedure) for Determining the Ratio of Horizontal to Vertical Hydraulic Conductivity in a Nonleaky Confined Aquifer³
- D 5716 Test Method to Measure the Rate of Well Discharge

¹ This guide is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.21 on Ground Water and Vadose Zone Investigations.

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² Annual Book of ASTM Standards, Vol 04.08.

³ Annual Book of ASTM Standards, Vol 04.09.