



Standard Guide for Documenting a Ground-Water Sampling Event¹

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1. Scope

1.1 This guide covers what and how information should be recorded in the field when sampling a ground-water monitoring well. Following these recommendations will provide adequate documentation in most monitoring programs. In some situations, it may be necessary to record additional or different information, or both, to thoroughly document the sampling event. In other cases, it may not be necessary to record all of the information recommended in this guide. The level of documentation will be based on site-specific conditions and regulatory requirements.

1.2 This guide is limited to written documentation of a ground-water sampling event. Other methods of documentation (that is, electronic and audiovisual) can be used but are not addressed in this guide. The specific activities addressed in this guide include documentation of static water level measurement, monitoring well purging, monitoring well sampling, field measurements, ground-water sample preparation, and ground-water sample shipment.

1.3 *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.*

1.4 *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.*

2. Referenced Documents

2.1 ASTM Standards:

D 4750 Test Method for Determining Subsurface Liquid Levels in a Borehole or Monitoring Well (Observation Well)²

D 5088 Practice for Decontamination of Field Equipment Used at Non-Radioactive Waste Sites²

D 5608 Practice for Decontamination of Field Equipment Used at Low-Level Radioactive Waste Sites²

D 5903 Guide for Planning and Preparing for a Ground-Water Sampling Event³

2.2 Government Document:

40 CFR 261.4 (d) (ii)⁴

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in this guide, refer to Terminology D 653.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *chain of custody*—the process of maintaining accountability of the samples for the purpose of identifying potential breaches in sample integrity.

3.2.2 *chain of custody record*—a record of all individuals who possess the samples from the time of collection until analysis.

4. Significance and Use

4.1 When sampling ground-water monitoring wells, it is very important to thoroughly document all field activities. Sufficient field data should be retained to allow one to reconstruct the procedures and conditions that may have affected the integrity of a sample. The field data generated are vital to the interpretation of the chemical data obtained from laboratory analyses of samples. Field data and observations may also be useful to analytical laboratory personnel.

5. Documentation Methods

5.1 Field records should be generated by a member of the sampling team. It is important to record procedures used and measurements immediately after they have been accomplished and are fresh in the memory. In general, notes should not be taken after returning from the field.

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² *Annual Book of ASTM Standards*, Vol 04.08.

³ *Annual Book of ASTM Standards*, Vol 04.09.

⁴ Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

5.2 The format of the documentation is discretionary, but should be consistent from well to well and in accordance with regulatory requirements. Forms are often used for consistency and to reduce the chance of failing to record needed information. It may be desirable for records to be entered with indelible ink in a hard cover, stitch-bound book for credibility in litigation.

6. Documentation Content

6.1 *General:*

6.1.1 Record the facility or site name, or both, and the well identification.

6.1.2 Record the weather conditions.

6.1.3 Record the names of all sampling team members.

6.1.4 Record any instrument calibration details to include instrument identification and date and time of last calibration.

6.1.5 Note any changes in the physical condition of the well.

6.1.6 Note changes in land use or physical conditions of the site.

6.1.7 Record wellhead observations and measurements (for example, odor, organic vapor measurements).

6.1.8 Record any quality control samples collected or prepared in the field.

6.1.9 Describe decontamination procedures for non-dedicated equipment (See Practice D 5088 and D 5608).

6.1.10 Record any deviations from the sampling and analysis plan.

6.2 *Static Water Level Measurement:*

6.2.1 Record the depth to water in the well from a reference point of known elevation. Optimally, there will be a mark or notch on the well casing to indicate the exact reference point (See Test Method D 4750).

6.2.2 Record the reference point from which the measurement was taken (that is, ground surface, top of well casing, top of protective casing).

6.2.3 Document the presence and estimated thickness of an immiscible layer.

6.2.4 Record the total depth of the well from either historical records or actual measurement.

6.2.5 Record the units of the measurement (that is, feet or metres).

6.2.6 Record the method or equipment (include serial number) used for measuring the depth to water in the well.

6.2.7 Record the date and time that the water level is measured.

6.2.8 Record any other relevant information (for example, were any nearby wells being pumped).

6.3 *Monitoring Well Purging:*

6.3.1 Briefly describe the purging method used.

6.3.2 Record the calculated purge volume (if applicable).

6.3.3 Record the volume of water removed from the well. Indicate if the well was purged to dryness.

6.3.4 Record all measurements taken during purging (that is, water levels, indicator parameter levels, organic vapor monitoring data).

6.3.5 Record the pumping rate, if known.

6.3.6 Record the type of equipment used to purge the well. Include the materials of construction of the equipment used.

6.3.7 Record the length of time spent purging the well.

6.3.8 Record the appearance of the water before and after purging.

6.3.9 Record the date and time that well purging is completed.

6.3.10 Briefly describe management of purged water.

6.4 *Monitoring Well Sampling:*

6.4.1 Record the analytes for which samples are being collected.

6.4.2 Record the order, by analyte, that sample containers are filled.

6.4.3 Record the volume, material of construction, and number of sample containers.

6.4.4 Record the equipment used to collect the samples. This should include a description of any component materials used that contact the ground water (for example, tubing, pump parts, bailer material, etc.).

6.4.5 Record the pumping rate, if applicable.

6.4.6 Record the date and approximate time that the sampling is accomplished.

6.4.7 Record the general appearance of the sample (that is color, clarity).

6.4.8 Note any problems or unusual events during the sampling.

6.4.9 Record the name of the person collecting the sample.

6.5 *Field Measurements:*

6.5.1 Record all field measurement data.

6.5.2 Record the units of measurement for each measurement taken.

6.5.3 Record all of the equipment/instrumentation used for field measurements and any calibration activities to include calibration standard information and date and time of calibration.

6.5.4 Record the date and time that field measurements are taken.

6.6 *Ground-Water Sample Preparation:*

6.6.1 Record the method of ground-water sample filtration, filter type and medium, and for which analytes filtration is performed.

6.6.2 Record any chemical preservatives used.

6.6.3 Record the manner of storage and shipment of samples (that is, refrigeration and packaging methods)

6.6.4 Record the name of the person who performs the sample preparation.

6.7 *Sample Container Labeling*—Ground-water samples should be labeled such that they will be intact and legible even if wet. The labels should contain, at a minimum, the following information: sample identification number, name of collector, date and time of collection, site identification, parameter(s) requested, and preservation methods.

6.8 *Ground-Water Sample Shipment:*

6.8.1 Record the method of shipment.

6.8.2 Record the type and number of shipping containers.

6.8.3 Note if a temperature check sample is included in the shipping container.

6.8.4 Provide a chain of custody record in each shipping container identifying the exact contents of that container. At a minimum, the chain of custody records should list the site identification, the sample identifiers and analyses required,

container sizes and types, chemical preservatives used, sampling dates, shipping date, and the samples preparer's name.

6.8.5 Other information that must accompany each shipping container as required in 40 CFR 261.4(d)(ii) follows: "the sample collector's name, mailing address, and telephone number; the laboratory's name, mailing address, and telephone number; the quantity of the sample; the date of shipment; and a description of the sample".

6.9 *Analytical Request Forms*—The analytical laboratory will need a written request for analytical support. The request is usually generated before the sampling event; however, a copy of the request or other forms for laboratory use may need to be included in the sample shipment. The laboratory will instruct the project manager on the forms to be submitted for

their use. Analytical request forms may include project manager's name, organization and phone number; project number or identifier; project location; brief description of the project objectives; any known contaminants associated with the project site, when sample containers and preservatives are needed; date samples will arrive; number and types of samples for each analyte; date results needed; desired detection limits and analytical methods; and, remarks or other special requirements.

7. Keywords

7.1 documentation; ground-water sampling; monitoring well

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