



Standard Practice for Sampling Unconsolidated Waste From Trucks¹

This standard is issued under the fixed designation D 5658; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers several methods for collecting waste samples from trucks. These methods are adapted specifically for sampling unconsolidated solid wastes in bulk loads using several types of sampling equipment.

1.2 *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.* See Section 6 for specific precautionary statements.

2. Referenced Documents

2.1 ASTM Standards:

- D 4687 Guide for General Planning of Waste Sampling²
- D 4700 Guide for Soil Sampling from the Vadose Zone³
- D 5088 Practice for Decontamination of Field Equipment Used at Non-radioactive Waste Sites⁴
- D 5283 Practice for Generation of Environmental Data Related to Waste Management Activities: Quality Assurance and Quality Control Planning and Implementation²
- D 5633 Practice for Sampling with a Scoop²

3. Terminology

3.1 Descriptions of Terms Specific to This Standard:

3.1.1 *authoritative sampling*—a sample selected without regard to randomization.

3.1.2 *paperwork*—all required documentation, which may include manifests, waste profiles, sample labels, site forms, etc.

3.1.3 *screening analysis*—a preliminary qualitative or semi-quantitative test that is designed to give the user rapid and specific information about a waste that will aid in determining waste identification, process compatibility, and safety in handling.

3.1.4 *unconsolidated*—for solid material, the characteristic of being uncemented or uncompacted, or both, and easily separated into smaller particles.

3.1.5 *waste profile*—specific information about the waste including its properties and composition, chemical constitu-

ents, waste codes, transportation information, etc.

3.1.6 *work plan*—a plan specific to a particular site, for conducting activities specified in the plan.

4. Summary of Practice

4.1 The truck and its contents are inspected and appropriate sampling equipment is selected. A clean sampling device is then used to scoop, core, or auger into the waste material. The sample or samples are collected and transferred to a sample container. The sampling device is then cleaned and decontaminated or disposed of.

5. Significance and Use

5.1 This practice is intended for use in the waste management industries to collect samples of unconsolidated waste from trucks. The sampling procedures described are general and should be used in conjunction with a site-specific work plan.

5.2 The purpose of collecting waste samples directly from a truck (rather than the waste source) is to verify (usually with screening analyses) that the waste contained in the truck is the same or similar material from a waste source that has been previously characterized and approved for treatment or disposal, or both.

6. Safety Precautions

6.1 Safety precautions must always be observed when sampling waste. The work plan must include a Worker Health and Safety section, because there are potential hazards associated with working around trucks as well as their potentially hazardous contents.

6.2 Truck sampling should be conducted from a properly designed platform to allow the sampler to safely access the truck bed with a minimum of difficulty.

7. Sampling Design

7.1 Truck sampling can be conducted for many different purposes. It is important that the purpose be integrated into the sample design. If the purpose of sampling is to characterize the waste, the sample should be collected from the waste source during the loading or unloading of the truck. This allows access to all portions of the material in the truck. If the purpose is to determine if the material in the truck conforms to a waste profile (that is, waste material that has previously been characterized), then a less rigorous sampling approach can be used. Because of the difficulties of sampling the material in the truck

¹ This practice is under the jurisdiction of ASTM Committee D34 on Waste Management and is the direct responsibility of Subcommittee D34.01.02 on Monitoring.

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² *Annual Book of ASTM Standards*, Vol 11.04.

³ *Annual Book of ASTM Standards*, Vol 04.08.

⁴ *Annual Book of ASTM Standards*, Vol 04.09.

in situ, (authoritative) grab samples are usually collected from the top portion of the material and subjected to screening type analysis. This method will quickly demonstrate that the sampled material (top portion) does or does not match the waste profile.

7.2 A work plan should be prepared describing the sampling locations, number of samples, depth of sampling and type of sampling equipment (see Practice D 5283 and Guide D 4687).

NOTE 1—Because of limited access to the truck bed for sampling, the samples collected are usually near-surface samples. There is a possibility that the material in the middle or on the bottom of the bed is different.

8. Pre-Sampling

8.1 Basic Pre-Sampling Practices:

8.1.1 Review all paperwork.

8.1.2 Access the truck by way of the sampling platform so that the waste can be visually inspected to confirm agreement with the paperwork and identify any obvious discrepancies (such as free liquids, etc.).

8.2 Sampling Equipment:

8.2.1 Selection:

8.2.1.1 Select the sampling equipment and sample containers appropriate for the waste in the truck, in accordance with the work plan or site-specific procedure. See Guide D 4687 for information on sample container selection.

8.2.1.2 The sampling equipment, sample preparation equipment, sample containers, etc., must be clean, dry, and inert to the material being sampled. Before use, all equipment including sample containers shall be inspected to ensure they are clear of obvious dirt and contamination and are in good working condition. Visible contamination shall be removed, and the equipment shall be decontaminated with the appropriate rinse materials. Prior to use, all cleaned equipment should be protected from contamination.

8.2.2 Materials of Construction:

8.2.2.1 Sampling devices are usually made of stainless steel, brass, or aluminum.

8.2.2.2 Sample containers should be made of plastic, glass, or other nonreactive materials (see Guide D 4687).

8.3 *Generic Equipment List*—The following is a general identification of equipment required for sampling unconsolidated waste from trucks.

8.3.1 *Scoop*, with extension handle.

8.3.2 *Trier*.

8.3.3 *Auger*.

8.3.4 *Concentric tube thief*, single slot, split tube, Missouri trier.

8.3.5 *Thin-walled tube*.

8.3.6 *Barrel auger*.

8.3.7 *Sample collection sheet*.

8.3.8 *Sample containers*, with lids and liners.

8.3.9 *Chain of custody forms*.

8.3.10 *Paperwork and site forms*.

8.3.11 *Sample labels*.

8.3.12 *Cloths or wipes*.

9. Sampling

9.1 Basic Sampling Practices:

9.1.1 Access the truck by way of the sampling platform and

collect the required number of samples using techniques in accordance with 9.2.

9.1.2 Place the collected material in a sample container.

9.1.3 Close the sample container.

9.1.4 Wipe the outside of the sample container. Dispose of the wipe cloth properly.

9.1.5 Note on site forms all relevant conditions and physical characteristics associated with the collection of the sample.

9.1.6 Fill out all required paperwork for each sample, as required by the work plan.

9.1.7 Complete and attach the label to the side of the sample container after the sample has been collected.

9.2 Sampling with a Concentric Tube Thief:

9.2.1 *General Description*—This device consists of two tubes, one fitting snugly inside the other (see Fig. 1). The bottom end of the outer tube is fitted with a point. Oblong holes are cut through both tubes. The holes are opened or closed by rotating the inner tube. Concentric tube samplers are commercially available up to 6 ft (1.8 m) long and several inches (centimeters) in diameter.

9.2.2 Concentric tube samples have a limited application for sampling trucks. Materials that are not free-flowing such as those that are hard packed, moist, or finely powdered will not enter this type of sampler under normal field conditions. Sampling of materials containing granules or particles exceeding one third of the slot width should not be attempted because bridging may occur.

9.2.3 Insert the tube into the material and push with uniform force to the bottom of the truck or until refusal. Rotate the concentric tubes to the open position, thereby allowing the sample to flow into the inner tube. Wiggle the sampler several times and rotate the tubes to the closed position. Withdraw the sampler. Place the sampling device immediately over a sample collection sheet and release the sample by rotating the concentric tubes to the open position. A sample can normally be removed from the thief with a spatula or similar instrument (reamer) and placed in the sample container.

9.3 Sampling with a Thin-Walled Tube Sampler:

9.3.1 *General Description*—Tube samplers may vary in length, diameter, and material of construction (see Fig. 2). The material to be sampled must be of a physical consistency (cohesive solid material) to be cored and retrieved with the tube. Materials with particles larger than one third of the inner diameter of the tube should not be sampled with that particular device. The length of the tube will depend on the desired sampling depth (see Guide D 4700). The tube is attached to a length of solid or tubular rod. The upper end of this rod is threaded to accept a handle or extension rods. This sampler can

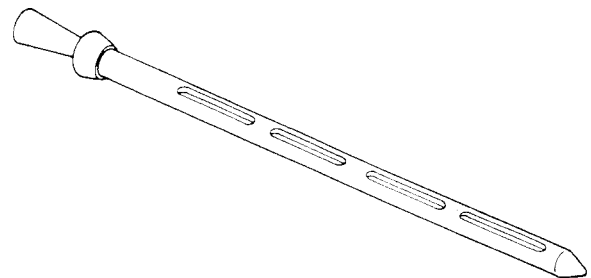


FIG. 1 Concentric Tube Thief

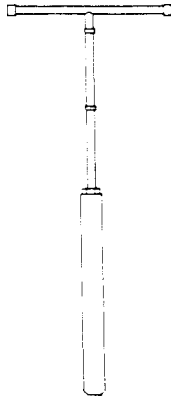


FIG. 2 Thin-walled Tube

be used to collect samples of unconsolidated clay-like materials.

9.3.2 The tube sampler is pushed into the material to be sampled by applying downward force on the unit's handle. Once the sampler has reached the bottom of the sampling interval, it is twisted to break the continuity at the tip. The sampler is pulled from the material and the sample is extruded into the sample container. Samples are extruded by forcing a rod through the tube.

9.4 Sampling with a Trier Sampler:

9.4.1 General Description—The trier is a metal or plastic tube from which one third to one half of the wall of the tube has been removed to form a slot along its entire length (see Fig. 3). This device can be up to 4 ft long (1.2 m) and should have a sharp, angled point at its lower end. The material to be sampled must have a physical consistency like a soil or similar fine-grained cohesive material. Sampling procedures can be found in Practice D 5451.

9.4.2 The trier is pushed vertically into the material and rotated one or two times to cut a core. The core is pulled out of the hole and removed from the trier with a spatula or similar instrument and placed in the sample container.

9.5 Sampling with an Auger:

9.5.1 General Description—The screw or ship auger is essentially a small diameter (for example, 1.5 in.; 3.8 cm) wood auger from which the cutting side flanges and tip have been removed. The auger is welded onto a length of solid or tubular rod. The upper end of this rod is threaded to accept a handle or extension rods (see Fig. 4 and Guide D 4700).

9.5.2 An auger can be used for collecting a disturbed sample of unconsolidated material from the truck. The auger is rotated

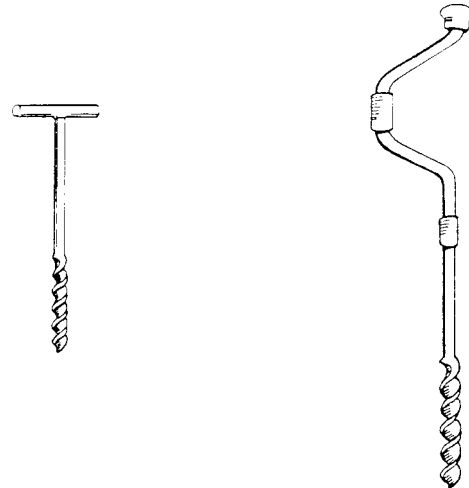


FIG. 4 Auger

manually or with a power source into the waste material. The operator may have to apply downward force to embed the auger; afterwards, the auger screws itself into the material. The auger is advanced to its full length, then pulled and removed. Material from the deepest interval is retained on the auger flights. The sample is collected from this extracted portion. Augers can be used to sample hard or compacted solid wastes or soil. Augers, like triers, are equipped with crossbars, facilitating the penetration of the waste.

9.6 Sampling with a Barrel Auger:

9.6.1 General Discussion—Dimensions and construction of a barrel auger will vary. A barrel auger typically consists of a stainless steel or carbide steel auger tip (orchard bit), a stainless steel cylinder, a bailed cap, an extension, and a cross handle (see Fig. 5 and Guide D 4700). A thin-walled internal sleeve may be used to contain the sample.

9.6.2 Barrel augers can be used for collecting discreet samples of disturbed material from various depths. The auger is rotated to advance the barrel into the truck load. The operator may have to apply downward pressure to keep the auger advancing. When the barrel is filled, the unit is withdrawn from the waste material and the sample is collected from the barrel.

9.7 Sampling with a Scoop:

9.7.1 General Description—Scoops must be of a size and shape suitable for the quantity and size of the particles to be

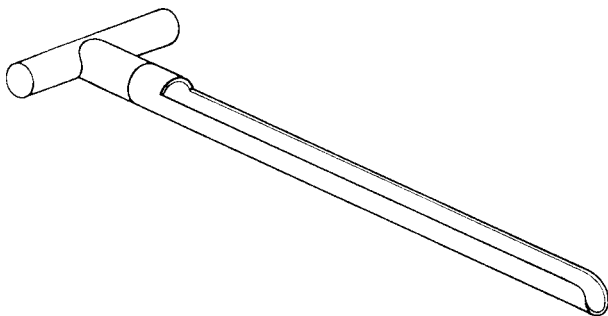


FIG. 3 Trier

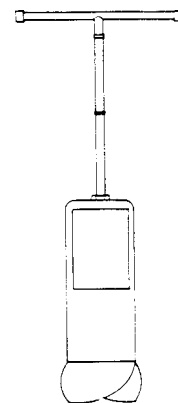


FIG. 5 Barrel Auger

sampled (see Fig. 6). The scoop is used for collecting equal portions at random spots at or near the surface of the waste. An extension to the scoop is often employed to assist the sampler in safely collecting the sample. For waste containing fragments or chunks, a scoop may be the only method capable of retaining the material in a sampling device. A scoop may be used in conjunction with the sampling devices previously described, or as the primary sampling device. Sampling procedures can be found in Practice D 5633.

9.7.2 Attach the scoop to an extension of appropriate length and collect the sample.

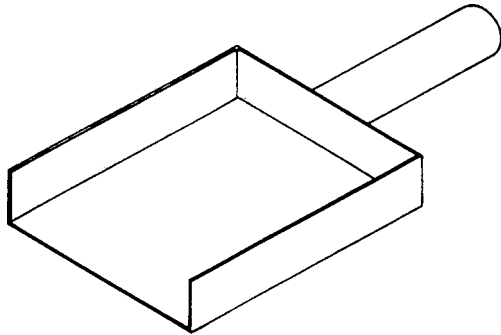


FIG. 6 Example of a Scoop

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10. Post Sampling

10.1 Transport the sample with appropriate chain of custody to the laboratory.

10.2 Remove all sampling equipment from the truck sampling area.

10.3 Transfer all direct contacting reusable equipment to a pre-designated decontamination area. Decontaminate the equipment according to the protocol established in the work plan (see Practice D 5088). Decontaminated sampling equipment should be protected from contamination. This may include, but not be limited to storage in aluminum foil, plastic bags, polytetrafluoroethylene film, or other means of protection that will not impact sample quality or the intended analyses.

10.4 Properly dispose of all used (disposable) contacting equipment.

11. Data Quality Objectives

11.1 The objectives for sampling and testing unconsolidated waste from trucks should be specified in the work plan (see Practice D 5283 and Guide D 4687).

12. Keywords

12.1 auger; barrel auger; concentric tube thief; sampling; scoop; thin-walled tube sampler; trier; truck sampling; waste