

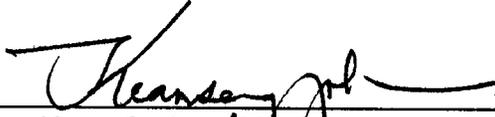
STANDARD OPERATING PROCEDURE
Soil Sampling, Including Auger and Surface Soil Procedures

KEY WORDS-

Soil, auger, composite sampling, soil cores

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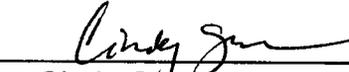
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Environmental Hazards Assessment Program (EHAP) organization and personnel such as management, senior scientist, quality assurance officer, project leader, etc. are defined and discussed in SOP ADMN002.

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1.0 INTRODUCTION

1.1 Purpose

To define the method for taking soil samples for chemical or physical analysis.

2.0 MATERIALS

Materials for auger sampling:

- 2.1 Stainless steel soil auger (3" diameter bucket)
- 2.2 Soil auger extensions prelabelled in 6" increments (enough to reach desired sampling depth)
- 2.3 Soil auger handle
- 2.4 7/8" open end wrenches (2)
- 2.5 4" diameter heavy walled PVC pipe cut into 1' length (1 or more)
- 2.6 Rubber mallet (1 or more)
- 2.7 2" x 4" wood cut into 1' length (1 or more)
- 2.8 18" x 24" plastic bags (1 per sample)
- 2.9 5 gallon buckets with handles (2)
- 2.10 5 gallon water cooler with spigot at the bottom
- 2.11 Wash brushes
- 2.12 Liquid soap
- 2.13 DI water
- 2.14 Isopropyl alcohol
- 2.15 Nalgene 500ml wash bottle
- 2.16 1 pint wide mouth mason jars (1 per sample), prelabelled with location and depth or sample number that is cross referenced with same information
- 2.17 Disposable gloves
- 2.18 Shovel

Materials for Surface Sampling:

- 2.19 1/2" ID PVC pipe cut into 6" lengths (1 per sample) or stainless steel tubes
 - 2.20 1/2 pint wide mouth mason jars (1 per sample), prelabelled with sample number
 - 2.21 Rubber mallet
 - 2.22 Disposable gloves
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3.0 PROCEDURES

3.1 Procedure for auger sampling (Figure A)

- 3.1.1 Place the PVC sleeve over the site to be sampled and drive it into the ground approximately 6" using the 2 x 4 and the rubber mallet.
- 3.1.2 Place a clean auger (see 3.4) in the sleeve. Turn the handle to advance the auger until it fills with soil. Pull the auger up and tap all of the soil into an 18" x 24" plastic bag. Return the auger to the sleeve and continue turning until the top of the auger is level with the soil surface (6"). Again pull the auger up and tap all the soil into the same bag. Surface soils tend to be compacted and when augering they "fluff" and it may be necessary to fill the auger two or more times to go from 0" to 6". For soils below the surface it is usual to fill the auger once per 6" depth.
- 3.1.3 While wearing disposable gloves, hold the top of the plastic bag closed while shaking the soil to mix it thoroughly. Use the prelabelled jar to take a sample from the bag by pouring the mixed soil into the jar. Put the lid on the jar and place it in an ice chest with dry ice.
- 3.1.4 Clean the auger by scrubbing it with a brush in a 5 gallon bucket filled with soapy water. Then rinse in a 5 gallon bucket filled with clear water. Then rinse again with DI water dispensed from the spigot of a water cooler. Give a final rinse with isopropyl alcohol dispensed from the nalgene wash bottle.
- 3.1.5 To prevent contamination from the 0" to 6"soil, knock off the dirt that is stuck to the inside of the pvc sleeve with a gloved hand and scoop it out of the bottom of the hole before taking the second sample.
- 3.1.6 Place a clean auger into the sleeve and advance 6". Pull the auger out of the sleeve and while holding in a horizontal position use the mallet to knock 1" to 2" of soil from each end of the auger to remove potentially contaminated soil . Tap the remaining soil into a 18" x 24" plastic bag.
- 3.1.7 Repeat steps 3.1.3, 3.1.4, and 3.1.6 until the desired depth is reached. Cleaning the sleeve, step 3.1.5, is only necessary after the surface 6" sample is taken.

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3.1.8 If the samples are for chemical analysis fill out a Chain of Custody for each sample (SOP ADMIN006). If the samples are for other analysis (texture, etc.) fill out a soil analysis sheet (see attached example).

3.1.9 Transport the samples to the warehouse on dry ice and store at 0°C.

3.2 Procedure for surface soil sampling

3.2.1 Use rubber mallet to drive the PVC or stainless steel tube into the ground to the desired depth. PVC pipe is used for softer soils and stainless steel is used for hard soils.

3.2.2 Place the PVC pipe in a prelabelled sample jar and tap it against the sides until all the soil from the pipe empties into the jar. For a sample collected with a stainless steel tube, tap the tube with a mallet above the jar to knock the soil into the jar.

3.2.3 Use the same pipe or tube to take additional soil cores to the same depth. These will be composited in the same sample jar. Depending on the analysis desired and the method used, a minimum amount of soil is needed (usually 100g or more). Typically 3 to 5 cores are necessary to have sufficient soil for one sample.

3.2.4 Put the lid on the jar and place it in an ice chest with dry ice.

3.2.5 Dispose of the used PVC pipe or place stainless steel tubes in a plastic bag for cleaning later. Use a new pipe or tube for each sample and repeat steps 3.2.2 through 3.2.4.

3.2.6 If the samples are for chemical analysis fill out a Chain of Custody for each sample (SOP ADMIN006). If the samples are for other analysis (texture, etc.) fill out a soil analysis sheet (see attached example).

3.2.7 Transport the samples to the warehouse on dry ice and store at 0°C.

3.2.8 Follow SOP EQOT002 for washing stainless steel tubes with the industrial dishwasher.

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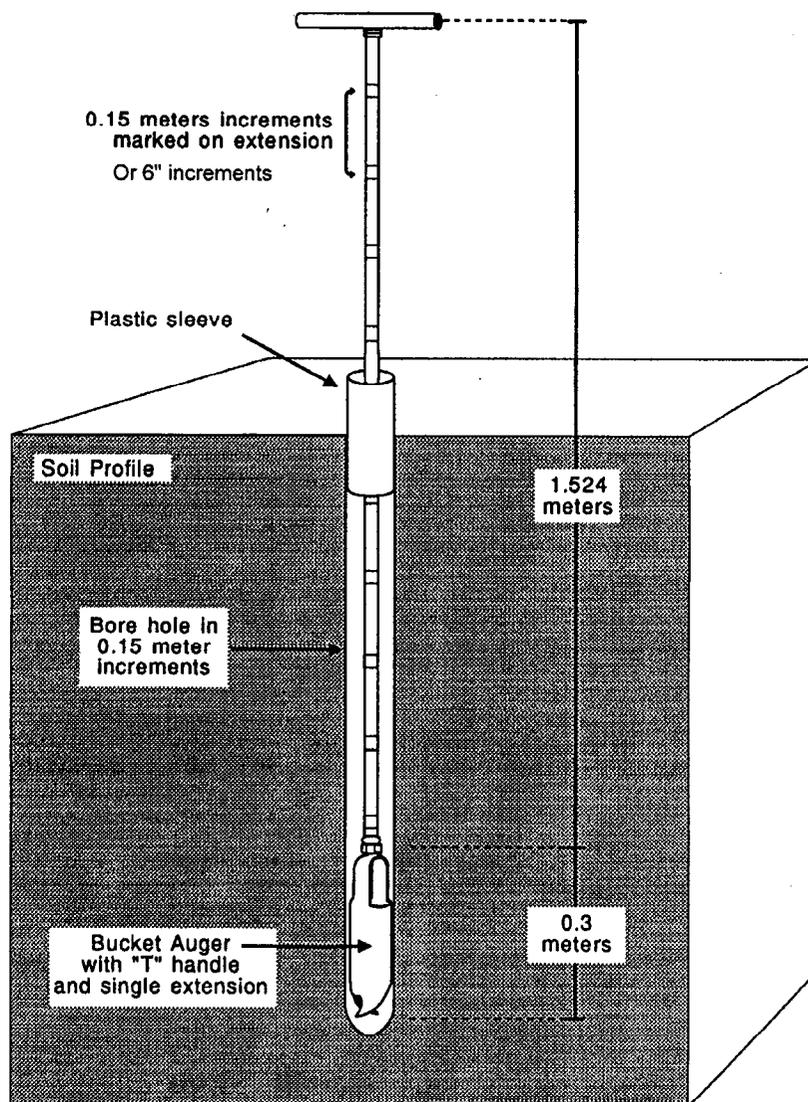


Figure A. Sampling a soil column with a bucket auger.

