

DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL
DIVISION OF AIR & WASTE MANAGEMENT
SITE INVESTIGATION & RESTORATION BRANCH

STANDARD OPERATING PROCEDURE
SOIL SAMPLING – SURFACE SOIL (0-6”)

Soil Sampling Procedure – Surface

A surface soil sample is usually considered to be the sample collected from the top 6 inches at the site. Primarily, surface soil samples are collected in areas that show “surface staining”, and/or areas suspected to have surface contamination. Surface soil samples can be predetermined by the Sampling and Analysis Plan (SAP) and/or they can be taken on an as needed basis dictated by site conditions. Samples can vary in depth but in general should not penetrate any deeper than 6”. Samples with depths deeper than 6” should be considered “shallow” soil samples. Different depths may be required in order to satisfy the current or future risk scenarios so always confirm the correct sampling depth with the DNREC-SAP.

Recommended Equipment:

- *Decontaminated Shovel
- *Certified pre-cleaned 8 oz wide mouth sample containers with labels
- *Plastic scoops
- *Food grade disposable aluminum warming pans (12 x 9.5 x 2.5)
- *40ml VOA vial with 25ml of methanol
- 10ml plastic syringe (with tip clipped off)
- Wax paper
- Fat and thin tipped waterproof markers such as the Sharpie fine point, the Sharpie extra fine point and/or the Sharpie ultra fine point
- PID
- Coolers with temperature blanks
- Ice
- Plastic zip bags
- Chain of custody forms for Screening lab and analytical lab
- Plastic garbage bag (for trash)
- Decontamination equipment (such as deionized or bottled water andalconox soap)

***Alternately Accepted Sampling Equipment:**

- Hand Auger
- Any size jar that is certified pre-cleaned
- 40ml VOA vial with 10ml of methanol,
- Stainless steel scoops
- Stainless steel pans

Procedure:

1. Before visiting the field, pre-cut plastic syringes so that they hold approximately 10 ml (milligrams) of soil.
2. Calibrate PID prior to field work.

3. Don appropriate protective equipment (minimum disposable gloves) as specified in the Site Health and Safety Plan.
4. Proceed to selected surface sample point.
5. Using a decontaminated shovel collect soil from the location into a stainless pan.
6. Collect the volatile sample as soon as the soil is in the pan (before the soil is homogenized). Shake for several moments to break up the soil in the vial.

Note: Collect a proportionate volume from each of the visually identifiable soil types to fill the 10ml syringe).

Caution: Do not overfill or spill the methanol, as this will yield inaccurate analytical results. If methanol is spilled, start over with a new vial.

7. With a fine tipped indelible marker record on the labels the same sample name, time and date of sample collection on the VOA vial and 8oz jars for the sample interval.

Note: All VOA vials can go into one Ziploc bag for storage in coolers.

8. Scan soil with a PID carefully insert PID/FID tip into cut space for several seconds. Record reading in field book.
9. Record in the log book the total inches of soil collected.
10. Describe and record the soil lithology using EQuIS approved terminology for grain size, color (Munsell Soil color charts can be used), consistency, relative moisture content, odors. Describe any other indicators such as staining, organic matter, foreign materials (glass, brick, slag, processed wood, etc).

Note: If analytical analysis is split between two labs then two jars of soil will need to be collected. Confirm with DNREC-SIRB chemists for the amount of bottleware needed.

11. Once the soil has been described, the sampler should shake as much of the dirt from roots and break up any soil clumps in order to homogenize the soil thoroughly.

Note: Clayey soil types are very difficult to homogenize. Do the best you can.

12. Scoop the homogenized soil into the 8oz wide mouth jar(s).

Note: In order to collect enough soil the original hole may need to be expanded beyond the original shoveled extent.

13. Label with a thick tipped indelible marker the top of each bottle with the sample name, date and time (this is a precaution in case the bottle labels fall off).
14. Collect screening sample. Scoop approximately one teaspoon of the homogenized soil and place on the wax paper. Fold the wax paper, 3 times in one direction, turn it 90 degrees and fold 3 times. Do not tape the wax paper.
15. Label the folded wax paper with the sample location ID with a thick tipped indelible marker and place in a Ziploc bag.

Note: All wax paper samples can go into a single Ziploc bag.

16. Place all samples in cooler.

Note: If ice in coolers is loose then place jars in individual Ziploc bag per sample. If ice is contained in bags and not likely to leak then sample jars need not be placed in Ziploc bags. Secure the lid tightly. The chemical preservation of solids is not generally recommended. Cooling to 4 degrees centigrade is usually the best approach supplemented by a manual holding time.

17. Record sample information on the chain of custody.

Note: Recycle used aluminum pans whenever possible.

Note: If using stainless steel pans and scoops, they must be decontaminated with alconox soap and deionized water before going to next using them at another sample location.

Repeat same sampling procedures for all surface soil samples unless otherwise dictated by DNREC-SIRB.