EG&G ROCKY FLATS PLANT	Manual:	4-E42-ER-OPS
ERM OPERATIONS PROCEDURE MANUAL	Procedure No.	GT.08,Rev.0
	Page:	1 of 41
	Effective Date:	
	Organization:	Environmental Restoration Management

ROCKY FLATS PLANT

4-E42-ER-OPS-GT.08

Revision 0, Draft A

Surface Soil Sampling

DOCUMENT CLASSIFICATION
REVIEW WAIVER PER
CLASSIFICATION OFFICE

Approved By: _____

(Associate General Manager) **(Date)**

Responsible Organization: **Environmental Restoration Management**

TABLE OF CONTENTS

1.0 PURPOSE 4
2.0 SCOPE 4
3.0 PREREQUISITE 4
4.0 METHODS FOR SURFACE RADIONUCLIDE SOIL SAMPLING 5
4.1 SOIL SAMPLING WITH THE CDH METHOD 6
4.1.1 Introduction 6
4.1.2 Equipment and Materials 6
4.1.3 Sampling Plot Layout 7
4.1.4 Procedures 8
4.2 SOIL SAMPLING WITH THE RF METHOD (JIG AND SCOOP) 9
4.2.1 Introduction 9
4.2.2 Equipment and Materials 10
4.2.3 Sampling Plot Layout 11
4.2.4 Procedures 11
4.3 GRAB SAMPLING (SPADE AND SCOOP 13
4.3.1 Introduction 13
4.3.2 Equipment and Materials 13
4.3.3 Sampling Plot Layout 14
4.3.4 Procedures 14
4.4 SOIL SAMPLING WITH THE VERTICAL SOIL PROFILE METHOD 15
4.4.1 Introduction 15
4.4.2 Equipment and Materials 16
4.4.3 Sampling Plot Layout 16
4.4.4 Procedures For Sampling From Surface Downward 17
4.4.5 Procedure For Sidewall Sampling 18
4.4.6 Procedures For Coring 19
4.4.7 Procedure For Sampling Under Asphalt and Concrete . . . 19
4.5 SURFACE SOIL SAMPLING BELOW ASPHALT OR CONCRETE . 20
4.5.1 Introduction 20
4.5.2 Equipment and Materials 21
4.5.3 Sampling Plot Layout 22
4.5.4 Sampling Procedure 22
4.6 ASPHALT OR CONCRETE SAMPLING FOR RADIONUCLIDES . . 24
4.6.1 Introduction 24
4.6.2 Equipment and Materials 24
4.6.3 **Sampling Plot Layout** 25
4.6.4 Procedures For Asphalt or Concrete Coring or Cutting . . 26
4.6.5 Procedures For Sampling Asphalt or Concrete Core 26

4.6.6 Sampling the Top and Bottom One-Fifth of Asphalt or Concrete 27
4.7 COMPOSITING OF SOIL SAMPLES 28

5.0 METHODS FOR NONRADIONUCLIDE SURFACE SOIL SAMPLING 28
5.1 GRAB SAMPLING (SPADE AND SCOOP) 29
5.2 SAMPLING WITH A HAND AUGER 29
5.2.1 Introduction 29
5.2.2 Equipment and Materials 29
5.2.3 Sampling Plot Layout 30
5.2.4 Procedures 30
5.3 SAMPLING BELOW ASPHALT OR CONCRETE 31
5.4 WIPE AND PAVEMENT SAMPLING FOR POLYCHLORINATED BIPHENYLS 32
5.4.1 Introduction 32
5.4.2 Equipment and Materials 32
5.4.3 Sampling Plot Layout 32
5.4.4 Collection Procedures for Wipe Sampling 33
5.4.5 Procedures for Destructive Sampling of Concrete 34
6.0 RECORDS 35
7.0 REFERENCES 36

List of Figures

Figure GT.8-1 CDH Soil Sampling Device Critical Dimensions 37
Figure GT.8-2 RF Soil Sampling Device Critical Dimensions 38
Figure GT.8-3 RF Method Soil Sampling Location Spacing 39

List of Forms

Form GT.8A Surface Soil Data Collection Form 40
Form GT.8B Surface Soil Sampling Field Activities Report 41

1.0 PURPOSE

This standard operating procedure describes procedures that will be used at the Rocky Flats Plant (RFP) to sample near-surface soils. Near-surface soils is defined as those soils between the ground surface and 1-meter (3.3 ft.) in depth. The procedure is divided into two primary sections: one for obtaining surface scrapes according to several protocols for assessing radionuclide contamination (Section 5.0) and another for more generalized sampling of near-surface soils, and other surface areas for nonradionuclide analyses (Section 6.0).

2.0 SCOPE

This procedure describes personnel responsibilities and qualifications, sampling equipment and procedures, decontamination, and documentation procedures.

The procedure is applicable to samples collected by Environmental Restoration Management (ERM), and its subcontractors, during field work. The implementation of the specifics of this procedure is determined by the requirements in the site-specific field sampling plan (FSP).

This procedure implements the requirements of the Inter-Agency Agreement (IAG) and the ERM Quality Assurance Project Plan (QAPjP).

3.0 PREREQUISITE

Personnel sampling surface soils will be scientists, engineers, or field technicians trained to conduct hazardous waste site work, as required by 29 CFR1910.120. These personnel will also have experience under the direct supervision of a qualified individual as specified in 3-21000-ADM-02.01, Rev.0 and 02.02, Rev.0; and be trained in the appropriate application of the standard operating procedures. The field team and field supervisor shall:

- Obtain from EG&G or its designee the appropriate documentation for radioactive material screening.
- Review the site-specific FSP and applicable procedures.
- Review the site-specific Health and Safety Plan and applicable procedures.

The required personal protective equipment for sampling surface soils will be detailed in the health and safety plan for the specific work task being conducted.

4.0 METHODS FOR SURFACE RADIONUCLIDE SOIL SAMPLING

The purpose of surface soil sampling at the RFP can be related to one or more specific objectives. These are as follows: 1) resuspension availability, which determines if radionuclides are present in the top-soil that could become resuspended in the air and thus pose a migration pathway by inhalation; 2) deposit inventories, which determine the amount of accumulated radionuclides deposited on the ground; 3) distribution of contaminants, which defines the areal distribution of contaminants; and 4) deposition increment, which defines the distribution with depth of radionuclides in the top 6 inches of soil to verify the results of the HPGe surveys.

To meet these objectives there are four radionuclide, surface soil sampling methods employed at RFP: 1) Colorado Department of Health (CHD) method, designed to sample for resuspension availability; 2) Rocky Flats (RF) method, designed to sample for deposit inventories; 3) Grab Sampling method for under asphalt and concrete, or where contamination may have occurred from a given point source, designed to sample for contaminant distribution; and 4) Vertical Soil Profile method, designed to sample for deposition increment.

Any or a combination of these sampling methods may be used as specified in the site-specific FSP. It should be noted that the CDH or RF methods are normally used in unpaved areas. However, grab sampling (spade and scoop) for radionuclides may be necessary for some RFP locations were the CDH or RF methods are not appropriate. Such as where contamination may have occurred from a given point source, or where a point source may have contaminated a very small or localized area. The sample type, basis for collection and required methodology can be determined by consulting the applicable workplan.

The primary considerations for acquiring surface soil samples for radionuclide analysis include the following:

- Sample handling should be minimized.
- The sample will be placed in an airtight 1-liter, wide-mouth glass, container immediately after collection.
- The sample will be properly labeled.

Field personnel are referred to procedure FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples for further details. Above-surface plant parts and coarse material (pebbles, rocks, and stones) will be removed by the sampling team. The soil samples will be classified according to procedure GT.1, Logging Alluvial and Bedrock Material. For surficial profiling samples, the sampler will collect representative samples, including organic material and coarse material. All sampling equipment will be protected from the ground surface with plastic sheeting.

4.1 SOIL SAMPLING WITH THE CDH METHOD

4.1.1 Introduction

The CDH sampler is one method for collecting soil samples for radionuclide analysis at the RFP. The CDH sampler was designed to sample radionuclides in the top-soil that could become resuspended in the air and thus pose a migration pathway by inhalation. The sampler is designed to obtain a sample from the upper surface 1/4 inch deep from an area 2 inches wide and 2 3/8 inches long, as shown in Figure GT.8-1.

Sampling locations will be described in the FSP. Some samples will be composited to obtain representative samples of large areas and others will be single-location samples. Sampling techniques for either type of sample are the same before compositing.

4.1.2 Equipment and Materials

The following is a list of equipment used for radionuclide contaminated soil sampling:

- CDH soil sampler;
- stainless steel scoop;
- stainless steel lab spoon;
- stainless steel mixing bowl or pan equivalent;
- sample containers;
- sample labels;
- wash and rinse tubs;
- phosphate-free, lab-grade detergent (e.g., Liquinox);
- distilled water;
- plastic sheeting;
- sample locations (map and/or list);
- measuring tape or wheel;

- Brunton compass;
- lawn or garden spade;
- appropriate health and safety equipment as specified in the applicable Health and Safety Plan;
- logbook; and
- cooler with ice or ice packs.

4.1.3 Sampling Plot Layout

A specified number of samples will be collected and composited from within sample plots. Under this scenario, the target locations of the samples will be described by an evenly spaced grid as specified in the site-specified FSP.

Preliminary location of sampling points will be achieved by staking and flagging the points. The sample points will be located by taping, use of a measuring wheel, or by pacing, combined with the use of Brunton compass. The sample plot layout will attempt to achieve location accuracies of within + or - 10 feet of the proposed work plan data acquisition points, as specified in procedure GT.17, Land Surveying. After all of the samples are collected within a sample plot; the southwest corner of the sample plot will be surveyed using standard surveying methods or global positioning system (GPS) methodologies. Refer to procedure GT.17, Land Surveying, or GT.27, GT.28, and GT.29 for GPS, for methods and acceptable uncertainty and range for the distance measurements made. Sample locations will be marked with a permanent identification, as designated in the FSP, so that the area may be located and resampled at a later date.

The planned locations of sample points may be revised (i.e., offset) when obstacles are encountered within the plot. If pavement, disturbed ground, or other obstacles are present that would jeopardize sample integrity or endanger the samplers, the grid may be adjusted to allow the specified number of samples to be obtained from a smaller area. When practical, the originally planned grid spacing will be maintained; however, this cannot be done if a relatively large portion of a plot cannot be sampled. All offset locations will be documented on a sketch complete enough to be able to relocate each sample location within an accuracy of 10 feet. Survey checks will be made to document the accuracy of the offset sample points.

The sampling plot layout for a single-location sample will follow the procedures as described in the site-specific FSP.

4.1.4 Procedures

The following procedures will be used for the CDH sampler:

1. Always use a clean sample container appropriate for the type of sample being collected. Refer to procedure FO.13, Containerization, Preserving, Handling and Shipping of soil and water samples for the appropriate type of container.

2. Label the sample container into which the soil sample is to be placed. Refer to procedure FO.13, Containerization, Preserving, Handling, and Shipping of soil and water samples for the type of information to be included on the label.

3. Carefully remove vegetation and any undesirable top layer of surfacial material to the desired sample depth with a decontaminated steel lawn or garden spade. Undesirable material is defined as; rocks, gravel, pebbles, scree, road base, paving material, vegetation or other organic material.

4. Make sure that the soil sampling template is decontaminated and dry, then place it on the ground and push it into the soil so that the soil surface is even with the upper surface of the sampling template.

5. At the back end of the template (the end farthest from the curved scoop at the front of the template), place the sampling spade in the soil 1/4 inch deep, up to the rolled edges on the flanges on each side of the spade, so that the rolled edges face the front edge of the template. Refer to Figure GT.8-1.

6. Gently, but firmly, draw the sampling spade forward, so that the soil is drawn to the curved scoop at the front of the sampling template.

7. Lift the spade, place it at the back of the template again and draw it forward once more to ensure that the entire volume that is defined by the template (1/4 inch deep by 2 inches wide by 2 3/8 inches long) is collected into the curved scoop at the front of the template. Repeat as necessary to obtain a complete sample.

8. Taking care not to spill any of the soil that has been collected, lift the template up from the ground. Place the curved scoop at the front of the template inside the sample container and tip the sampling template up

to pour the soil into the container. Brush any soil that adheres to the scoop into the sample container.

9. Close the container.

10. After samples are placed in sample containers, the outside of the container will be wiped clean of excess material and it will be placed in a plastic bag.

11. Transfer the samples to the sample manager. Refer to procedure FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples for the proper paperwork and sample transfer methods. This documentation is a QA record and must go into the ERM records center.

12. Either use another set of clean sampling equipment or decontaminate equipment after use and between sample locations. For specific decontamination guidelines, consult procedure FO.3, General Equipment Decontamination. Decontamination according to these procedures is not necessary between composite sample points; however, excess dirt or mud should be cleaned from the equipment.

Duplicate samples will be obtained by offsetting the primary sample location 6 inches to 2 feet upwind or in a direction technically more appropriate and placing the duplicate samples in a separate jar. The location of the duplicate will be documented on the data collection form. The duplicate sample will be composited and containerized following the same procedures as for the primary sample. The frequency of duplicate samples will be defined in the FSP or the Quality Assurance Addendum (QAA).

4.2 SOIL SAMPLING WITH THE RF METHOD (JIG AND SCOOP)

4.2.1 Introduction

The purpose of sampling is to determine the amount of accumulated plutonium that has been deposited on the ground. This determination is accomplished by collecting a sample volume of 5,000 cm^3 of soil in situ. The jig outlines a square area with 10-cm sides and is driven 5 cm into the soil to cut three sides of the sample (Figure GT.8-2). At the fourth side, soil is removed from outside the jig's perimeter. The scoop is used to finish the cut on both the fourth side of the sample and the bottom surface. Ten samples should be collected at each location and composited.

In very rocky areas, good sample geometry (shape) cannot be achieved with the jig. In those cases, the jig and the metric rule should be used to gauge the desired sample size. Rocks and soil are pried or chiseled out of place for collection.

4.2.2 Equipment and Materials

The following is a list of equipment used for the RF method.

- soil sampling jig (10 X 10 X 5 cm);
- spare sampling jig parts;
- stainless steel scoop;
- stainless steel bowl;
- brushes, wire, and paint;
- wash bucket, and paper towels;
- phosphate-free, lab-grade detergent (e.g. Liquinox)
- distilled water;
- plastic bags;
- paint cans, 1 gallon new;
- hammer;
- miscellaneous cold chisels;
- pointed cement trowel;
- black waterproof (permanent) marking pens;
- metric rule;
- wood block (10 X 10 X 30 cm);
- site selection plan (FSP);
- appropriate health and safety equipment as specified in the applicable Health and Safety Plan;
- logbook;
- cooler with ice or ice packs;
- plastic sheeting; and
- sample containers and labels.

4.2.3 Sampling Plot Layout

A site selection plan as described in the applicable FSP should be used to specify the general site location. The plan must provide adequate information for the sample collection crew to locate each specific site. Sample locations will be marked with an identification sign, as designated in the FSP, so that the area may be located and resampled at a later date. Permission to collect samples and mark the site should be obtained from the appropriate EG&G department or the landowner. Sample collection crews will be accompanied by supervision for all sampling activities to ensure that specified procedures are followed.

The following general site selection criteria should be considered:

- undisturbed location for the time interval of interest;
- near the center of a large, flat, open area;
- not subject to excessive runoff during heavy rain;
- light to moderate vegetation and permeable soil; and
- not in an area of mechanical disturbance.

Consideration of these criteria will depend on the nature of the study. For example, in some instances it may be necessary to investigate an area of mechanical disturbance.

If a sample site is not available that meets the criteria described in the FSP, the location can be moved up to one-half the distance to the next grid sample location or within 10 feet of a staked sample location which is not part of a grid. If the sample location must be moved further than this distance, regulatory agency concurrence will need to be obtained. Any movement of sample locations will be documented on the surface soil data collection form and in the field crew supervisors logbook.

All selected sites should be located on a map.

4.2.4 Procedures

Ten soil samples should be collected at each site and composited for analysis. Samples should be collected at the center and corners of two one-meter squares that are spaced one meter apart. Figure GT.8-3 illustrates this sample collection spacing. The following procedures will be used for the RF method:

1. Place the sampling jig on the ground, and using the wood block and hammer, drive the jig into the soil to a depth of 5 cm.

2. With minimal disturbance to the soil inside the jig, use a scoop, trowel, or chisel to remove the soil from around the open side of the sample jig. Soil should be removed to a depth that will allow easy removal of the sample.

3. Discard the soil removed from outside the jig.

4. Remove soil samples from the interior jig with scoop/trowel and place it in a 10-mesh metal sieve that has a plastic bag attached to the bottom to receive the soil that passes through the sieve. After all 10 samples (5 samples from each of the two 1-meter square templates) have been placed into the sieve, attach the sieve cover and seal with tape. Sieving may be done in stages if all 10 soil samples cannot be placed into the sieve at the same time.

5. Label the sample container into which the soil sample is to be placed. Refer to procedure FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples, for the type of information to be included on the label, and the appropriate type of container.

   This documentation is a QA records and must go into the ERM records center.

Shake the sieve for several minutes. If the soil is moist, gently crush soil aggregate with fingers, while wearing proper personal protective equipment as prescribed in the applicable Health and Safety Plan, and continue shaking until all soil matrix has passed through the sieve. Discard large particles (cobbles, stones, etc.) that do not pass through the sieve into original disturbed area.

6. In order to reduce the volume of the sieved sample to the quantity required for laboratory analysis, and still maintain a representative sample; place <u>all</u> sieved soil into stainless steel pan. Mix soil thoroughly with a scoop/trowel. Divide sieved soil into quarters. Subsample each quarter equally so the total amount of subsampled soil to be used for <u>analysis</u> does not exceed 1 kg or one 1-gal paint can. Place each of the four subsamples into one plastic bag. Place plastic bag in metal 1-gal paint can. Leave about 1 inch headspace in paint can.

7. Place residual sieved soil from quartering inside plastic bag, and place bag inside another paint can. If residual soil exceeds volume of one 1-gal paint can, place excess residual sieved soil back into original disturbed area.

8. Store residual sieved soil for potential use at a later date.

9. Decontaminate sieve between uses following procedure FO.3, General Equipment Decontamination.

4.3 GRAB SAMPLING (SPADE AND SCOOP)

4.3.1 Introduction

Surface soil samples can be collected for radionuclide analyses using grab sampling (spade and scoop) methods.

Sampling locations and the number of soil samples will be described in the specific Field Sampling Plan for each project. Equipment, sample plot layout, and sampling procedures are described in the following sections.

4.3.2 Equipment and Materials

The following is a list of equipment for nonradionuclide contaminated soil sampling:

- spade (long handle);
- stainless steel hand auger (optional);
- mason trowel;
- stainless steel scoop;
- stainless steel lab spoon;
- sample labels;
- sample containers;
- wash/rinse tubs;
- phosphate-free, laboratory-grade detergent (e.g., Liquinox);
- distilled water;
- plastic sheeting;
- sample locations (map and/or list);
- appropriate health and safety equipment as specified in the applicable Health and Safety Plan;
- photoionization detector (PID) or flame ionization detector (FID);
- logbook;

- measuring tape or wheel;
- Brunton compass;
- cooler with ice or ice packs; and
- shovel.

4.3.3 Sampling Plot Layout

Sample locations are described in the Field Sampling Plan for each project. Permission and clearance for collecting samples will need to be coordinated with the appropriate EG&G department or the landowner for the specific area. Utilities will be cleared before any intrusive work.

Preliminary location of sampling points will be achieved by staking and flagging the points. The sample plot layout will attempt to achieve location accuracies of within + or - 10 feet of the proposed work plan data acquisition points, as specified in procedure GT.17, Land Surveying. After all of the samples are collected within a sample plot; the southwest corner of the sample plot will be surveyed using standard surveying methods or global positioning system (GPS) methodologies. Refer to procedure GT.17, Land Surveying, or GT.27, GT.28, and GT.29 for GPS, for methods and acceptable uncertainty and range for the distance measurements made. The sample location will be sketched on a field map. Sample locations will be marked with an identification sign, as designated in the FSP, so that the area may be located and resampled at a later date.

The sample points will be surveyed by taping, use of a measuring wheel, or by pacing, combined with the use of Brunton compass. Regardless of the method used, survey checks will be made to verify the accuracy of the measurements.

Photographs of the surrounding area and the soil will be at the discretion of the field crew supervisor. If a significant feature or something out of the ordinary is encountered that may effect sampling and should be documented; then a photograph will be taken. Photography shall be coordinated with the RFP photography department at least one week in advance of the sampling event.

4.3.4 Procedures

The following procedures will apply for surface-soil sampling with a spade and scoop.

1. Carefully remove vegetation and any undesirable surfical material to the desired sample depth with a decontaminated steel lawn or garden

spade. Desired sample depth will be specified in the project specific work plan.

2. Using a decontaminated stainless steel scoop or trowel, remove and discard the thin layer of soil from the area that contacted the shovel.

3. Remove debris and coarse materials such as pebbles, rocks, and stones.

4. Collect the appropriate quantity of sample using a stainless steel spoon or scoop.

5. Transfer the sample into an appropriate sample container with a stainless steel lab spoon or equivalent. Refer to procedure FO.13, Containerization, Preserving, Handling and Shipping of Soil and Water Samples for the type of container.

6. Label the sample container with the appropriate sample information including date and time, the sampler's initials, the sample identification, and sample location. Record information on the field data collection form. Handle samples according to procedure FO.13, Containerization, Preserving, Handling and Shipping of Soil and Water Samples. This documentation is a QA record and must go into the ERM records center.

4.4 SOIL SAMPLING WITH THE VERTICAL SOIL PROFILE METHOD

4.4.1 Introduction

The purpose of vertical soil profile sampling is to define the distribution of radionuclides in the top 6 inches of soil to verify the results of the HPGe surveys. This step is accomplished by collecting discrete soil samples at 2-inch intervals corresponding to depths from: 0 to 2 inches, 2 to 4 inches, and 4 to 6 inches. Sampling intervals of two-inches is required to define the extent of radiological contamination within discrete layers of the surface soil to verify the results of the HPGe surveys. There are four procedures for obtaining these samples: 1) collection from the surface downward, 2) collection from the side wall of a small excavation, 3) collection by coring, and 4) collection from beneath concrete or asphalt pavement. Use of any of the following procedures will depend on site conditions at the time of sampling. The specific procedure chosen to meet site conditions will be documented on the surface soil data collection form and in the field supervisors log book.

Sampling locations and the number of soil and quality assurance samples will be described in the FSP. Equipment, sample plot layout, sample procedures and site restoration is described in the following sections.

4.4.2 Equipment and Materials

The following is a list of equipment used for vertical soil profile sampling:

- Brunton compass;
- measuring tape or wheel;
- stainless steel scoop, spoon or trowel;
- tap water, or deionized, distilled water;
- wash and rinse tubs;
- phosphate free, lab-grade detergent (e.g. Liquinox)
- spray bottle or orchard sprayer;
- shovel;
- sledge hammer (optional)
- pick (optional);
- corer (optional);
- chalk marker;
- concrete saw (optional);
- wet-vac (optional);
- plastic sheeting;
- sample containers;
- sample labels;
- appropriate health and safety equipment as specified in the applicable Health and Safety Plan;
- logbook; and
- cooler with ice or ice packs.

4.4.3 Sampling Plot Layout

The sample location will be determined from the results of the HPGe survey. Permission and clearance for collecting samples will need to be coordinated with the plant manager or landowner for the specific area. Utilities will be cleared before any intrusive work.

Each sample location will be located within ± 10 feet (as specified in procedure GT.17, Land Surveying) of the proposed work plan location by measuring its distance to a permanent landmark using a measuring wheel, or measuring tape, and a Brunton compass. The sample location will be sketched on a field map.

Sample locations will be marked with a permanent identification, as designated in the FSP, so that the area may be located and resampled at a later date.

Photographs of the surrounding area and the soil will be at the discretion of the field crew supervisor. If a significant feature or something out of the ordinary is encountered that may effect sampling and should be documented; then a photograph will be taken. Photography shall be coordinated with the RFP photography department at least one week in advance of the sampling event.

A small area measuring about 24 by 24 to 36 by 36 inches will be selected for the sample location. The planned location may be offset by up to 3 feet, but should be placed as close to the original location as possible. If a large cobble is encountered below the ground surface, the soil sample may be collected from either side of the cobble. The presence of cobbles and where the sample was collected around the cobble will be documented in the data collection form and the field supervisors log book.

4.4.4 Procedures For Sampling From Surface Downward

1. Use a stainless scoop/trowel to collect a 500 gram sample from the surface, 0 to 2 inches, sample and place in a 500 mL sample container; include organic material and coarse sample material that is encountered during sampling. Collect sample uniformly in thickness. If necessary, the soil may be moistened with tap water (or deionized, distilled water, if the sample is to be split for inorganic metals analysis) using a spray bottle or orchard sprayer, to enhance sample collection by preventing fine soil particles from becoming airborne.

2. Collect the next sample from a depth interval of 2 to 4 inches below the first sample interval (0 to 2 inches) using the method in Step 1 above.

3. Collect the last sample from a depth interval of 4 to 6 inches below the second sample interval (2 to 4 inches) using the method in Step 1 above.

4. Backfill the sample location with any residual excavated material on the same day that the initial excavation and sampling is performed.

Either use another set of clean sampling equipment or decontaminate the sampling equipment between each step following procedure FO.3, General Equipment Decontamination.

4.4.5 Procedure For Sidewall Sampling (use when large soil components prevent excavation from surface downward)

1. Dig a small excavation (maximum depth equal to 12 inches). Stockpile excavated material near excavation on plastic sheeting.

2. Scrape the upper few inches (0 to 3 inches) of soil from one side of the pit with a stainless steel scoop/trowel to expose a fresh surface and prevent cross-contamination. If necessary, the soil may be moistened with tap water, (or deionized, distilled water, if the sample is to be split for inorganic metals analysis) using a spray bottle, or orchard sprayer, to enhance sample collection by preventing fine soil particles from becoming airborne.

3. Use a stainless steel scoop/trowel to collect a 500 gram sample from the sidewall surface, 0 to 2 inches in the depth and place in a 500 mL sample container; include organic material and coarse sample material encountered during sampling. Collect a sample of uniform thickness and depth into the sidewall.

4. Scrape the next lower few inches (2 to 5 inches) of the pit sidewall below the first sample interval (0 to 2 inches) with a stainless steel scoop/trowel.

5. Collect the next sidewall sample from a depth of 2 to 4 inches below the first sample interval (0 to 2 inches), following Step 3 above.

6. Scrape the last lower few inches (4 to 7 inches) of the pit sidewall below the second sample (2 to 4 inches) with a stainless steel scoop/trowel.

7. Collect the last sidewall sample from a depth interval of 4 to 6 inches below the second sample (2 to 4 inches), using the method in Step 3 above.

8. Backfill the excavated material on the same day that the initial excavation and sampling is performed.

Either use another set of clean sampling equipment or decontaminate the sampling equipment between each step following procedure FO.3, General Equipment Decontamination.

4.4.6 Procedures For Coring

1. Use a hand-powered, stainless steel "cookie cutter" type corer to collect a 500 gram sample from the top 0 to 2 inches and place in a 500 mL sample container; include organic material and coarse sample material encountered during sampling. Collect the sample uniformly from the surface to a 2-inch depth. If necessary, the soil may be moistened with deionized, distilled water using a spray bottle, or orchard sprayer, to enhance sample collection by preventing fine soil particles from becoming airborne.

2. Collect the next core sample from a depth interval of 2 to 4 inches below the first sample interval (0 to 2 inches), using the method in Step 1 above.

3. Collect the last core sample from, a depth interval of 4 to 6 inches immediately below the second sample interval (2 to 4 inches), using the methods in Step 1 above.

4. If the sample displays a tendency to fall out of the corer while extracting it, the sampling technician should attempt to cover the bottom of the corer with a stainless steel spoon as it is extracted from the soil so the depth specific sample will fall onto the spoon and can then be transferred to the sample container.

5. Backfill the sample location with any residual excavated material on the same day that the initial excavation and sampling is performed.

Either use another set of clean sampling equipment or decontaminate the sampling equipment between each step following procedure FO.3, General Equipment Decontamination.

4.4.7 Procedure For Sampling Under Asphalt and Concrete

1. Measure and mark a 24-by 24-inch or 36-by 36-inch area on the asphalt or concrete at the selected sample location using a chalk marker.

2. Cut on the line marked in chalk using a water-lubricated concrete saw; use precaution to avoid cutting into and disturbing the underlying soils. Cut all sides of the marked area.

3. If the use of a wet-dry vacuum satisfies the applicable health and safety plan requirements for control of airborne contamination, collect excess water using a wet-vac, if needed, to prevent the migration of water that may be contaminated from contact with contaminated concrete or asphalt. Any water collected will be placed with the used decontamination water and disposed at the decontamination pad.

4. Use a sledge hammer, or a pick and shovel for asphalt, to carefully break the concrete/asphalt into large pieces. Take care to prevent crushing the concrete/asphalt into small pieces that would interfere with sampling the underlying soil. Remove the pieces of concrete/asphalt from the sample area.

5. Sample the underlying soil using any one of the methods outlined in Sections 4.4.4, 4.4.5, or 4.4.6.

6. Repair the asphalt or concrete by filling the core hole with asphalt patch or premix concrete, leveling it with the surrounding surface. A permanent identification marker will be placed so that the area may be located and resampled at a later date if necessary.

Either use another set of clean sampling equipment or decontaminate the sampling equipment between each step following procedure FO.3, General Equipment Decontamination.

Procedures for minimizing dust generation and personal protective equipment are described in the applicable Health and Safety Plan.

4.5 SURFACE SOIL SAMPLING BELOW ASPHALT OR CONCRETE

4.5.1 Introduction

The purpose of sampling surficial soil under asphalt or concrete is to determine if chemical contamination or radionuclides are present in the soils underlying these covers and determine their concentration, if present. This step is accomplished by removing a small amount of the asphalt or concrete overlying the surface soil at the designated sampling location, and then collecting a grab sample of the soil.

Sampling locations, the number of soil samples and quality assurance samples and any potential sampling problems will be described in each projects Field Sampling Plan. The following sections describe the sampling equipment,

sample plot layout, and sampling procedure for collecting surface soil samples from below asphalt or concrete.

4.5.2 Equipment and Materials

The following is a list of equipment required for surface soil sampling below asphalt or concrete.

- field map;
- Brunton compass;
- measuring tape or wheel;
- steel posts (optional);
- identification signs (optional);
- landscaping nails (optional);
- surveyor's tape (optional);
- stainless steel scoop or trowel;
- steel lawn or garden spade;
- deionized, distilled, high purity water;
- wash and rinse tubs;
- plastic sheeting;
- phosphate free, lab grade detergent (e.g. Liquinox)
- spray bottle or orchard sprayer;
- shovel;
- pick;
- sledge hammer;
- concrete core drill (optional);
- chalk marker;
- wet-dry vacuum (optional);
- portable generator (optional);
- asphalt patch;
- sample containers and labels;
- appropriate health and safety equipment as specified in the applicable Health and Safety Plan;
- logbook; and
- cooler with ice or ice packs.

4.5.3 Sampling Plot Layout

Surface soil sample locations are tentatively identified in the FSP for each OU. Permission and clearance for collecting samples will require coordination with the appropriate EG&G department or the landowner for a specific area. Additionally, a utility clearance will be conducted at each sampling location

before asphalt or concrete coring. Each sample location will be determined within ± 10 feet (as specified in procedure GT.17, Land Surveying) of the proposed work plan location by measuring its bearing and distance to a permanent landmark using a Brunton compass and a measuring wheel or tape. The sample location will be sketched on a field map. Sample locations will be marked with an identification sign, as designated in the FSP so that the area may be located and resampled at a later date.

Photographs of the surrounding area and condition of the soil will be at the discretion of the field crew supervisor. If a significant feature or something out of the ordinary is encountered that may effect sampling and should be documented; then a photograph will be taken. Photography will be coordinated with the RFP photography department at least one week before the sampling event.

The planned locations may require slight adjustments depending on site conditions at the time of sampling. If obstacles are encountered (such as large cobbles), locations will be offset as close as possible to the original location, up to a maximum of 3 feet. The presence of large cobbles and where the sample was collected around the cobble will be documented in the data collection form and the field supervisors logbook.

4.5.4 Sampling Procedure

1. Use a Brunton compass and tape measure to determine individual sampling locations and a sampling grid. Mark the identified locations with chalk.

2. Cut a small diameter (2 to 4 inches) core of the asphalt or concrete using a water-lubricated, power coring device. Use caution to avoid cutting into and disturbing the underlying soils.

3. If the use of a wet-dry vacuum satisfies the applicable health and safety plan requirements for control of airborne contamination, collect excess water using a wet-dry vacuum to prevent the migration of water that may be contaminated from contact with contaminated asphalt or concrete. Any water collected will be placed with the used decontamination water and disposed at the decontamination pad.

4. Remove the asphalt or concrete core from the sampling area taking care to prevent crushing the material into small pieces. The small pieces could interfere with sampling the underlying soil.

5. Carefully remove any fill material from directly beneath the asphalt or concrete, which may be overlying the original soil surface, with a decontaminated steel lawn or garden spade.

6. Remove debris and coarse materials such as pebbles, rocks and stones.

7. Using a stainless steel scoop or spoon, transfer the desired sample quantity into an appropriate sample container. Refer to procedure FO.13, Containerization, Preserving, Handling and Shipping of Soil and Water Samples for the type of container.

8. Label the sample container with the appropriate sample information including date and time, the samplers initials, the sample identification and sample location. Record information on the field data collection form. Handle samples according to procedure FO.13, Containerization, Preserving, Handling and Shipping of Soil and Water Samples. This documentation is a QA record and must go into the ERM records center.

9. Either use a clean set of sampling equipment or decontaminate sampling equipment after use and between sample locations, following procedure FO.3, General Equipment Decontamination.

10. Repair the asphalt or concrete by filling the core hole with asphalt patch or premix concrete, leveling it with the surrounding surface. A permanent identification marker will be placed so that the area may be located and resampled at a later date if necessary.

    Duplicate samples will be obtained by moving from the primary sample location 6 inches to 2 feet upwind or in a direction technically more appropriate and repeating the sampling procedure. The location of the duplicate will be documented on the data collection form. The Field Sampling Plan specific to each project will detail the number of duplicate samples required.

4.6 ASPHALT OR CONCRETE SAMPLING FOR RADIONUCLIDES

4.6.1 Introduction

The purpose of sampling asphalt or concrete is to determine if radionuclides are present within and/or adhering to these cover materials and determine their concentration, if present. This is accomplished by removing a small amount of

the asphalt or concrete at the designated sampling location, containerizing the sample, and submitting it for analysis.

Sampling locations and the number of asphalt or concrete samples and quality assurance samples will be described in the specific Field Sampling Plan for each project. Equipment, sample plot layout, and sampling procedures for collecting asphalt and concrete samples, procedures for sample handling, and sample site restoration is described in the following sections.

4.6.2 Equipment and Materials

The following is a list of equipment required for asphalt or concrete sampling.

- field map;
- Brunton compass;
- measuring tape or wheel;
- steel posts (optional);
- identification signs (optional);
- landscaping nails (optional);
- surveyor's tape (optional);
- stainless steel trowel;
- stainless steel bowl;
- stainless steel hand auger (optional);
- deionized, distilled, high-purity water;
- wash and rinse tubs;
- phosphate free, lab-grade detergent (e.g. Liquinox);
- plastic sheeting;
- spray bottle or orchard sprayer;
- hammer;
- chisel;
- shovel;
- pick;
- concrete saw (optional);
- concrete core drill (optional);
- chalk marker;
- wet-dry vacuum (optional);
- portable generator (optional);
- large ziplock bags;
- aluminum foil;
- asphalt patch;
- plastic wrap;

- 1-gallon paint cans;
- sample labels;
- cooler with ice or ice packs;
- logbook; and
- appropriate health and safety equipment as specified in the applicable Health and Safety Plan.

4.6.3 Sampling Plot Layout

Asphalt or concrete sample locations are tentatively identified in the Field Sampling Plan for each project. Permission and clearance for collecting samples will need to be coordinated with the appropriate EG&G department or the landowner for the specific area. Additionally, a utility clearance will be conducted at each sampling location before asphalt or concrete coring or cutting. Each sample location will be located within ± 10 feet (as specified in procedure GT.17, Land Surveying) of the proposed work plan location by measuring its bearing and distance to a permanent landmark using a Brunton compass and a measuring wheel or measuring tape. The sample location will be sketched on a field map. Upon completion of sampling at each location, the location will be marked with an identification sign, as designated in the FSP, so that the area may be located and resampled at a later date if necessary.

Photographs of the surrounding area and the condition of the asphalt or concrete will be at the discretion of the field crew supervisor. If a significant feature or something out of the ordinary is encountered that may effect sampling and should be documented; then a photograph will be taken. Photography shall be coordinated with the RFP photography department at least one week in advance of the sampling event.

The planned locations may require slight adjustments depending on site conditions at the time of sampling. If obstacles are encountered (such as large cobbles), locations will be offset as close as possible to the original location, up to a maximum of 3 feet. The presence of large cobbles and where the sample was collected around the cobble will be documented in the data collection form ad the field supervisors logbook.

4.6.4 Procedures For Asphalt or Concrete Coring or Cutting

1. Use a Brunton compass and tape measure to locate individual sampling locations and/or sampling grid. Mark the identified locations with chalk.

2. For core sampling (Section 4.6.5), cut a small diameter core (2 to 4 inches) completely through the asphalt or concrete using a water lubricated, power coring device.

3. For sampling the top and bottom one-fifth of the asphalt or concrete cover material (Section 4.6.6), multiple concrete cores will need to be cut in order to obtain sufficient sample quantity. Mark the selected sample location. Cut asphalt or concrete cores (as described in Step 2) from immediately surrounding the sample location, cutting the subsequent cores adjacent to and as close as possible to the previous core cut.

4. If the use of a wet-dry vacuum satisfies the applicable health and safety plan requirements for control of airborne contamination, collect excess water using a wet-dry vacuum, if needed, to preclude the migration of water that may be contaminated from contact with contaminated asphalt or concrete. Any water collected will be placed with the used decontamination water and disposed at the decontamination pad.

5. Sample the multiple asphalt or concrete cores as detailed in Section 4.6.6.

4.6.5 Procedures For Sampling Asphalt or Concrete Core

1. Label a large ziplock bag with the project identification number, OU number, sample site identification number, sample collection date and time, and name of sample collector.

2. Remove the asphalt or concrete core from the cut. Clearly mark the core to indicate the top surface. First wrap the core in aluminum foil. Next, wrap the aluminum covered core in plastic wrap. Insert the wrapped core into the labeled ziplock bag.

3. Complete necessary paperwork (chain-of-custody, etc.) and transfer the sample to the sample manager. This documentation is a QA record and must go into the ERM records center.

4. Repair the asphalt or concrete by filling the core hole with asphalt patch or premix concrete to the same height as the surrounding surface. A permanent identification marker will be placed so that the area may be located and resampled at a later date if necessary.

5. Either use another set of clean sampling equipment or decontaminate all sampling equipment after use and between sample locations using procedures detailed in procedure FO.3, General Equipment Decontamination.

4.6.6 Sampling the Top and Bottom One-Fifth of Asphalt or Concrete

1. Label a clean, 1-gallon paint can with the sample site identification, sample collection date, and name of sample collector.

2. Remove one of the asphalt or concrete cores that were cut, (as detailed in Section 4.6.4, Step 3) from the core drill.

3. Measure and mark the top one-fifth and bottom one-fifth of the total thickness of the asphalt or concrete core.

4. Using a hammer and chisel, chip away the top one-fifth of the core sample, trying to chip as large of pieces as possible. Collect this top one-fifth of the core material in a 1-gallon paint can until 1- to 1.5-kg of sample is obtained.

5. Repeat Step 4 on the bottom one-fifth of the core sample and collect material in a separate 1-gallon paint can.

6. Repeat Step 2 through 5 until the desired sample quantity (see Step 4) is obtained.

7. Repair the asphalt or concrete as per Section 4.6.5, Step 4.

Duplicate samples will be obtained by offsetting from the primary sample location 6 inches to 2 feet upwind or in a direction technically more appropriate and repeating Section 4.6.4, and either Section 4.6.5, or 4.6.6 procedures. The location of the duplicate will be documented on a data collection form.

4.7 COMPOSITING OF SOIL SAMPLES

Compositing of samples will be required for some tasks. This will be done by emptying the sample container(s) into a large stainless steel pan and stirring by using a stainless steel scoop or spoon to thoroughly mix the sample(s). The soil will be scraped from the sides, corners, and bottom of the pan, rolled to the center of the pan, and mixed. The sample will then need to be quartered and

moved to the four corners of the mixing pan. Each quarter of the sample will then be mixed individually. Each quarter will then be rolled to the center of the mixing pan and the entire sample mixed together again. This procedure will be repeated as necessary to provide a homogenous sample before being placed in the sample container(s).

5.0 METHODS FOR NONRADIONUCLIDE SURFACE SOIL SAMPLING

Soil sampling for nonradionuclide samples will be done with either a stainless steel scoop or spoon. For depth-specific sampling, a manual operated stainless steel hand auger may be used. Methods for asphalt and concrete removal are described for sampling beneath these barriers. Methods for wipe and destructive samples for polychlorinated biphenyls (PCBs) are also described in this section. The primary consideration for acquiring samples in the field include the following:

- Sample handling should be minimized.
- Sample/air contact should be minimized.
- The sample will be placed in an air-tight container immediately after collection.
- Depth-specific samples acquired with a hand auger will be labeled and marked with the appropriate depth.

The sample type, basis for collection and required methodology can be determined by consulting the applicable work plan.

For further information on sample handling, refer to procedure FO.13, Containerization, Preserving, Handling, and Shipping Soil and Water Samples, and the site-specific FSP.

5.1 GRAB SAMPLING (SPADE AND SCOOP)

Surface soil samples can be collected for nonradionuclide analyses using grab sampling (spade and scoop) methods.

Except for the analytical methods, the procedure for nonradionuclide grab sampling (spade and scoop) is identical to the radionuclide procedure. Therefore, refer to Section 4.3 for the complete procedure.

5.2 SAMPLING WITH A HAND AUGER

5.2.1 Introduction

A hand auger will be used to collect depth-specific surface soil samples up to a total depth of 1-meter below ground surface. Sampling locations and the number of soil samples will be described in the specific Field Sampling Plan for each project. Equipment, sample plot layout, sampling procedures, and sample handling are described in the following sections.

5.2.2 Equipment and Materials

The following is a list of equipment for nonradionuclide contaminated soil sampling:

- spade (long handle);
- stainless steel hand auger;
- mason trowel;
- stainless steel scoop;
- stainless steel lab spoon;
- sample labels;
- sample containers;
- wash/rinse tubs;
- phosphate-free, laboratory-grade detergent (e.g., Liquinox);
- distilled water;
- plastic sheeting;
- locations (map and/or list);
- appropriate health and safety equipment as specified in the applicable Health and Safety Plan;
- photoionization detector (PID) or flame ionization detector (FID);
- logbook;
- measuring tape or wheel;
- Brunton compass;
- ice chest with ice or ice packs; and
- shovel.

5.2.3 Sampling Plot Layout

Sample locations are described in the Field Sampling Plan for each project. Permission and clearance for collecting samples will need to be coordinated

with the appropriate EG&G department or the landowner for the specific area. Utilities will be cleared before any intrusive work.

Each sample location will be located within ± 10 feet (as specified in procedure GT.17, Land Surveying) of the proposed work plan location by measuring its distance to a permanent landmark using a measuring wheel, or measuring tape, and a Brunton compass. The sample location will be sketched on a field map. Sample locations will be marked with an identification sign, as designated in the FSP, so that the area may be located and resampled at a later date.

After all of the samples are collected within a sample plot; the southwest corner of the sample plot will be surveyed using standard surveying methods or global positioning system (GPS) methodologies. Refer to procedure GT.17, Land Surveying, or GT.27, GT.28, and GT.29 for GPS, for methods and acceptable uncertainty and range for the distance measurements made.

Photographs of the surrounding area and the soil will be at the discretion of the field crew supervisor. If a significant feature or something out of the ordinary is encountered that may effect sampling and should be documented; then a photograph will be taken. Photography shall be coordinated with the RFP photography department at least one week in advance of the sampling event.

5.2.4 Procedures

The following procedures will apply for subsurface soil sampling with a stainless steel hand auger.

1. Carefully remove vegetation and any undesirable surfical material or fill material to the desired sample depth point with a decontaminated steel lawn or garden spade.

2. Using a decontaminated stainless steel scoop or trowel, remove and discard the thin layer of soil from the area that contacted the shovel.

3. At each sample location, a borehole will be advanced with a decontaminated 2 3/4-inch outside diameter stainless steel hand auger to the initial target depth interval as specified in the FSP. Most boreholes will have three target depth intervals at 10 to 14 inches, 22 to 26 inches, and 34 to 38 inches. Surficial soils will be defined as those between the ground surface and 1-meter in depth.

4. The auger will be withdrawn from the boring and the sample will be transferred to a decontaminated stainless steel pan where it will be thoroughly mixed with a stainless steel spoon. The sample will then be transferred to a precleaned, wide-mouth 8-ounce jar, labeled, and placed in a cooler.

5. The crew will then use a hand auger to reach the next target depth. The sampling process will be repeated.

6. Decontaminate all sampling equipment between sampling depths following procedure FO.3, General Equipment Decontamination.

7. Label the sample container with the appropriate sample information including date and time, the sampler's initials, the sample identification number, sample location, and depth interval. Record the information on the field data collection form. Handle samples in accordance with procedure FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples. The documentation is a QA record and must go into the ERM records center.

5.3 SAMPLING BELOW ASPHALT OR CONCRETE

Except for the analytical methods, the procedure for nonradionuclide surface-soil sampling below asphalt or concrete is identical to the radionuclide procedure. Therefore, refer to Section 4.5 for the complete procedure.

5.4 WIPE AND PAVEMENT SAMPLING FOR POLYCHLORINATED BIPHENYLS

5.4.1 Introduction

Sampling of nonporous (sealed concrete, tile, stainless steel surfaces, etc.) and porous surfaces (concrete and asphalt) is required to determine if surface areas have been contaminated with PCB-contaminated oils. The following sections describe methods for the collection of grab samples from nonporous hard surfaces (wipe samples), and porous surfaces such as concrete, wood, and asphalt (destructive samples) for PCB analysis.

Specific sampling locations and number of soil and quality assurance samples will be described in the FSP section of the work plan for each operable unit.

5.4.2 Equipment and Materials

The following is a list of equipment required for sampling:

- Whatman 40 ashless filter paper or Whatman 50 smear tabs or precleaned 3 by 3 inch gauze pads;
- steel forceps;
- rubber gloves;
- 100 cm^2 template;
- solvent (isooctane from the laboratory) to wet sample filer or gauze;
- hammer;
- chisel;
- pick;
- drill (optional);
- logbook; and
- appropriate health and safety equipment as specified in the applicable Health and Safety Plan.

5.4.3 Sampling Plot Layout

The sampling plot layout and location will be described in the Field Sampling Plan for each project. Care will be taken to select as smooth a surface as possible to ensure that a representative sample is collected. The sample area will correspond to a 100 cm2 area marked by a template.

Permission and clearance for collecting samples will be coordinated with the appropriate EG&G department or the landowner for the specific area.

Each sample location will be located within ± 10 feet (as specified in procedure GT.17, Land Surveying) of the proposed work plan location by measuring its distance to a permanent landmark using a measuring wheel, or measuring tape, and a Brunton compass. The sample location will be sketched on a field map. Sample locations will be marked with a permanent identification sign so that the area may be located and resampled at a later date.

Photography of the surrounding area and the sample location will be at the discretion of the field crew supervisor. If a significant feature or something out of the ordinary is encountered that may effect sampling and should be documented; then a photograph will be taken. Photography shall be coordinated with the RFP photography department at least one week in advance of the sampling event.

5.4.4 Collection Procedures for Wipe Sampling

1. Place the 100 cm^2 template over the sample location to outline the area to be wipe sampled.

2. Apply the laboratory solvent (isooctane) to the Whatman filter paper or sterile gauze pad so that the paper or pad is evenly moistened.

3. Wipe the surface of the area inside the template thoroughly with the moistened Whatman filter paper or precleaned gauze pad using rubber gloves or steel forceps to hold the filter paper/gauze pad.

4. Place the filter paper/gauze pad into the appropriately marked sample jar as described in the FSP.

5. Label the sample container with the appropriate sample information including date and time, the sampler's initials, the sample identification number, and sample location.

6. Record information on the field data collection form. Handle samples according to procedure FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples. This documentation is a QA record and must go into the ERM records center.

7. Collect a duplicate sample, in accordance with the FSP, by moving to a location 6 inches to 2 feet upwind or in a direction technically more appropriate and placing the duplicate sample in a separate jar. The location of the duplicate will be documented on a data collection form. Decontaminate all sampling equipment using the procedures described in Step 6 and Section 6.0 before collecting the duplicate sample.

8. Either use another set of clean sampling equipment or decontaminate all sampling equipment thoroughly using the procedures described in Section 6.0. A final rinse of all sampling equipment shall be conducted using the laboratory-provided solvent.

5.4.5 Procedures for Destructive Sampling of Concrete

Because porous surfaces will absorb PCBs, wipe sampling will not be used to sample these surfaces. Instead, a discrete sample will be chiseled, drilled, or sawed from the surface to remove sufficient sample for analysis. The following procedures will be used for destructive sampling:

1. Use a chisel, pick, or drill, to remove a surface sample measuring 1 cm deep.

2. Collect enough sample to fill an 8-ounce precleaned jar that is appropriately labeled as described in the FSP.

3. Label the sample container with the appropriate sample information including date and time, the sampler's initials, the sample identification, and sample location.

4. Record information on the field data collection form. Handle samples according to procedure FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples. This documentation is a QA record and must go into the ERM records center.

5. Collect a duplicate sample, in accordance with the FSP, by moving to a location 6 inches to 2 feet upwind or in a direction technically more appropriate and placing the duplicate sample in a separate jar. The location of the duplicate will be documented on a data collection form.

6. Either use another set of clean sampling equipment or decontaminate all sampling equipment thoroughly following procedure FO.3, General Equipment Decontamination.

7. Repair the asphalt or concrete by filling the core hole with asphalt patch or premix concrete to the same height as the surrounding surface. A permanent identification marker will be placed so that the area may be located and resampled at a later date if necessary.

   Due to the difficulties in collecting a destructive sample from a concrete roof, swipe samples will be used to sample PCBs in these locations.

   Procedures for personal protective equipment and general health and safety are described in the applicable Health and Safety Plan.

6.0 RECORDS

All records for field investigations are subject to requirements set forth in RFP Sitewide QAPjP. All of the forms described in this section and any additional records as defined in the QAPjP 17, Section 2 need to be turned over to the project manager within 10 days of completion. The project manager is

responsible for transmittal of the completed records within 30 days of completion as specified in 3-21000-ADM-17.01.

Form GT.8A, Surface Soil Data Collection form, will be completed for each sample location and for composite samples with the northwest corner of the composite area for the X, Y location. The information needed includes sample number, date, time, location code, purpose, sample location, composite information, collection method, sampling team members, volume collected, headspace reading, if applicable, and Chain of Custody (COC) number. Form GT.8B, Surface Soil Sampling Field Activities Report, will be used for collection of samples for compositing. The form should include project identification, date, sampler, location, grid description and time.

Chain-of-custody procedures for all sampling is detailed in procedure FO.13, Containerization, Preserving, Handling and Shipping of Soil and Water Samples.

All photographs will be numbered, dated, labeled with the project number, site and sample location number; and kept in the project files.

7.0 REFERENCES

The following is a list of references reviewed before writing this procedure:

A Compendium of Superfund Field Operations Methods. EPA/540/P-87/001. December 1987.

Colorado Department of Health Radiation Counting Facility Operating Procedure. Version 1.0 "Soil Sample Collection-Surface." July 1989.

Field Manual For Grid Sampling of PCB Spill Sites to Verify Cleanup. EPA/560/5-86-017. May 1986.

Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. Interim Final. EPA/540/G-89/004. October 1988.

PCB Spill Cleanup Policy. 40 Code of Federal Regulation, Part 761, Subpart G.

RCRA Facility Investigation Guidance. Interim Final. May 1989.

Rockwell International Rocky Flats Plant Environmental Restoration Program, Quality Control Plan. January 1989.

SOP FO.3, General Equipment Decontamination;

SOP FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water samples;

SOP FO.16, Field Radiological Measurements;

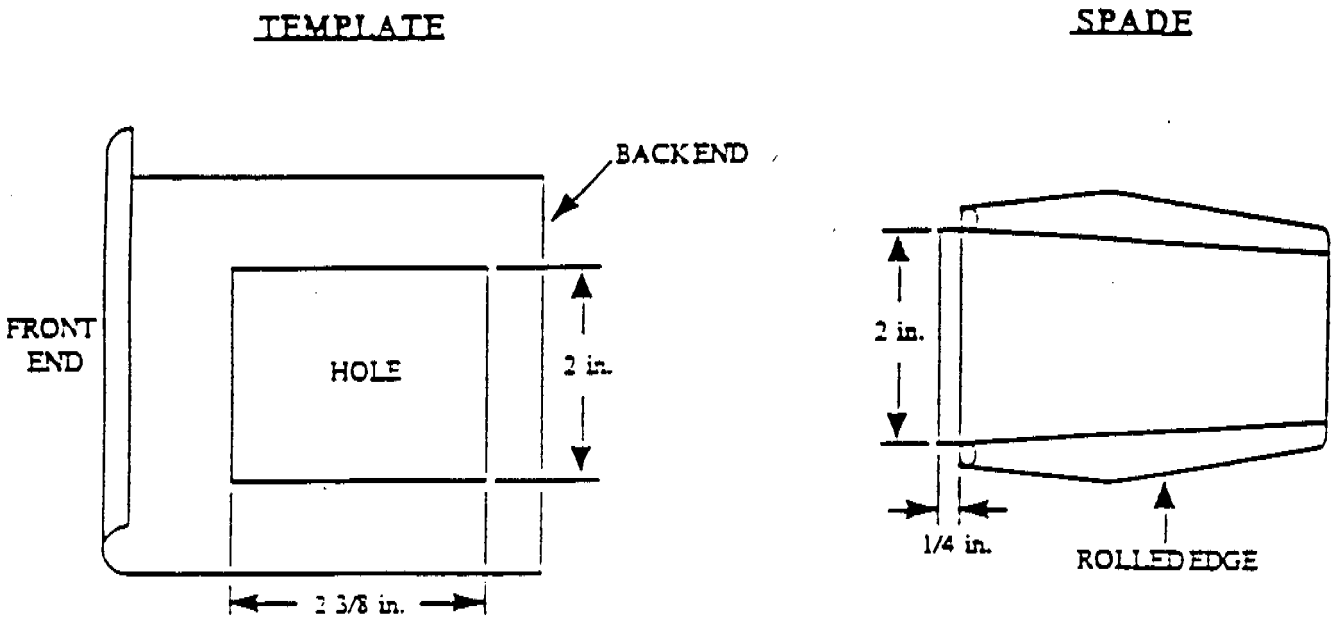
SOP GT.1 Logging Alluvial and Bedrock Material;

SOP GT.2, Drilling and Sampling Using Hollow-Stem Auger Techniques; and

SOP GT.7, Logging of Test Pits and Trenches.

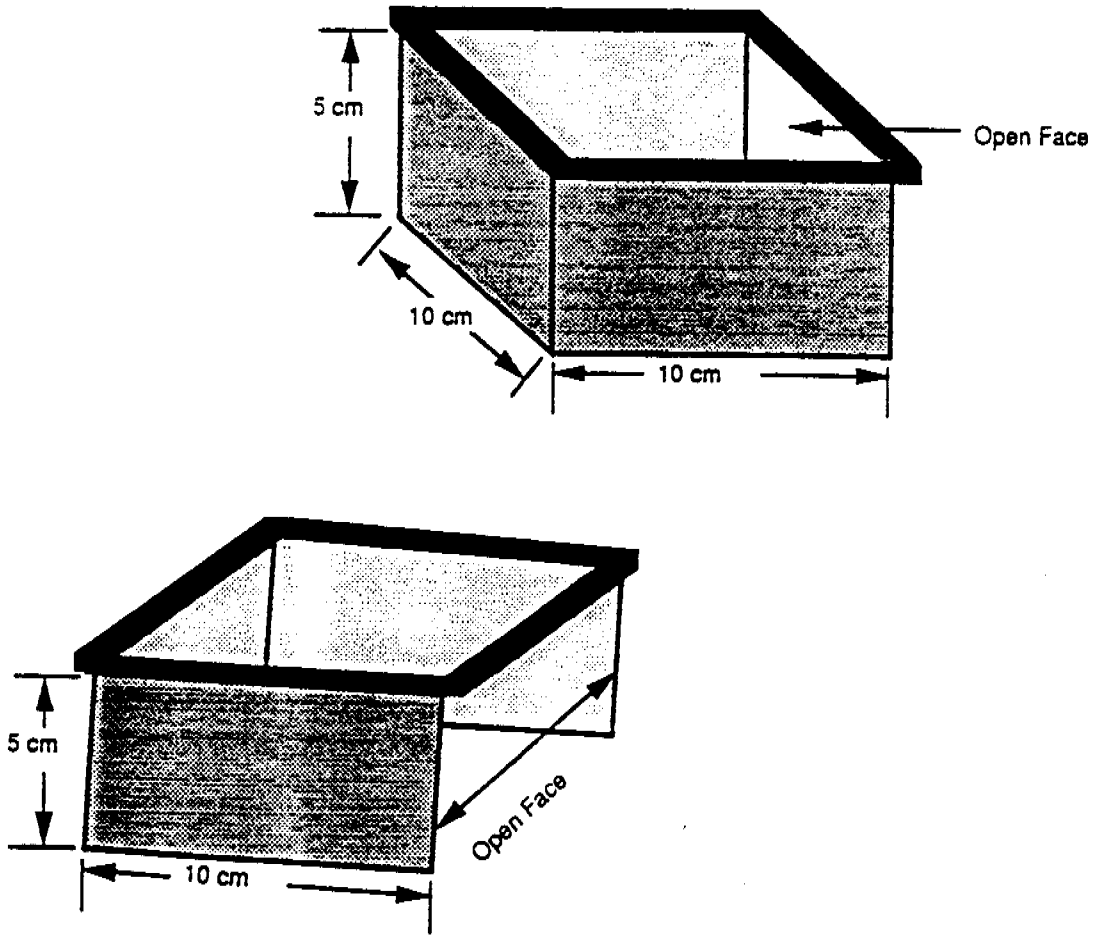
The Environmental Survey Manual. DOE/EH-0053. Volumes 1-4. August 1987.

Figure GT.8-1 CDH Soil Sampling Device Critical Dimensions



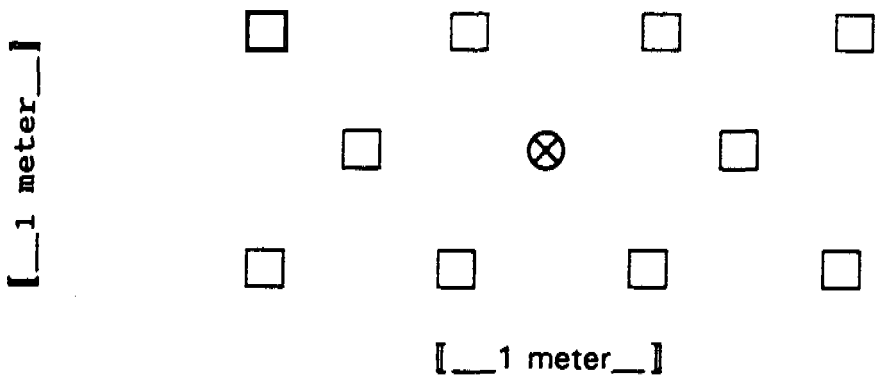
NOT TO SCALE

Figure GT.8-2 RF Soil Sampling Device Critical Dimensions



NOT TO SCALE

Figure GT.8-3 RF Method Soil Sampling Location Spacing



⊗ - Sample Location

□ - Subsample Location

U.S DEPARTMENT OF ENERGY ROCKY FLATS PLANT FORM FO.14C
SURFICIAL SOIL SAMPLE FORM Revision 16 SEP 93

Sample Collection Form

Project Number: Type: SS
Sample Number:
Contractor:
Station Code:

Collection Date: Quarter: Disposition:
Colection Time: Purpose:
Sample Location:
Composite: (Y/N)
Composite Desc:
QC Type: Partner:
Collection Method:

Sample Team Leader:
Member:
Member:
Volume Collected: Units:
Prepared By:

Surface Soil Sample Form

Depth of Take	Start	End
	in	
	in	
	in	
	in	

Headspace Reading
Comments

Sample Crew Member: _____
Print Name

_____
Signature Date

SURFACE SOIL SAMPLING
FIELD ACTIVITIES REPORT

Project Name	
Site Identification	**Date**
Sampler	

SAMPLE POINT	GRID LOCATION	TIME	COMMENTS

COMPLETED BY:		
PRINT NAME	SIGNATURE	DATE
SUBCONTRACTOR:		