Revised August 19..

INSTRUCTIONS FOR COLLECTING SOIL SAMPLES AND COMPLETING SAMPLE TAGS FOR PLUTONIUM ANALYSIS

I. INTRODUCTION

Proper care in the collection, identification, and handling of soil samples is imperative. Strict adherence to the procedures outlined below may eliminate hours wasted in correcting location description information and misleading data. Please remember that one of the largest variables in this type of effort is in the physical collection of the sample. Try to be as consistent as possible.

II. SAMPLE COLLECTION

A. Definition

A routine off-site sample will be any soil sample collected expressly for plutonium analysis from an area beyond the borders of the Nevada Test Site and when the alpha activity is not significantly greater than background as measured with a PAC-1S survey instrument. Should an off-site sample show a PAC-1S reading above background, consult subsection "C" of this SOP, since the sample must receive special handling.

B. Selection and Identification of Sampling Locations for the Off-NTS Pu Survey

The sampling locations should be chosen from the line intersections of a five-mile-by-five-mile square grid. Cross-country travel and equipment abuse is to be discouraged. Every effort should be used to approach the appropriate grid location using existing roads and trails. In many cases, adjoining locations will necessarily be approached from different directions. The desert is mazed with roads and most locations will be accessible. The exact position of the grid is left to the collector. A preliminary scouting may be necessary to situate the grid on the existing roadways.

After the collector has begun sampling a general area (e.g., Sandy Valley) other collectors should use his established grid. To avoid duplication, all collectors must periodically update their maps with one of the master maps.

Choose a location that is in the open and that appears to have been undisturbed for the last five to ten years. The surface should be free of excessive amounts of rocks, vegetation, etc. The area should not be subject to excessive water erosion. Old alluvial fans are often the most acceptable locations. Bear in mind that you are trying to collect a sample that has been subjected to largely undisturbed years of exposure to radioactive fallout.

Each sample point will be defined so that it can be relocated in the future. Set a surveyor's stake marked with station and location number in the area where the sample is collected. Adequately identify the location in the collection book and mark the location as accurately as possible on a map.

C. Sample Collection Procedures

There are three basic sampling procedures that are used by the MOT. These are surface sampling; profile sampling; and core, or plug sampling. The core technique is not commonly used and is not described in this SOP.

1. Pre-sampling survey

A reading with a PAC-1S survey meter coupled to a wide area alpha probe should be made at each location. In the unlikely event that you should get a positive reading, notify Chief, Terrestrial Monitoring Branch, the Field Coordinator or the Radiation Safety Officer upon returning that sample to NERC-LV.

2. Surface sampling

Using a trowel, insert the trowel straight down into the ground. Dig out behind the trowel so that you have a sloping trench with one perpendicular wall. Insert the 5 cm or 2.5 cm scoop with the top parallel to the surface. When scoop is full, empty it into a doubled plastic bag. See Figure 1 below.

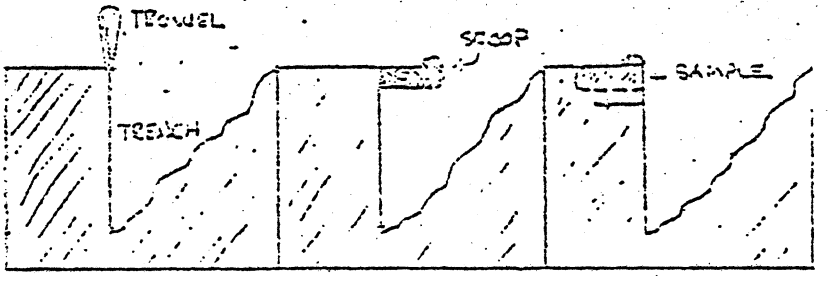

Figure 1. Trench method for soil sampling.

Take nine more samples near the first from an area which is not more than ten yards in diameter. Since each sample is 100 cm^2 the total area sampled will be 1 m^2. All ten samples will be composited in the same doubled plastic bag.

3. Profile samplings

Profile sampling is accomplished in the same manner as is surface sampling except that you will be collecting successive 5 cm or 2.5 cm layers. This means, of course, that you will have to dig a pit deep enough and wide enough to accommodate your scoop. The number of samples or the depth of sampling will be given as separate instructions.

When the pit has been dug, make one side perpendicular with the aid of the trowel. Using the scoop, take samples of successive layers to the depth required. Each scoopfull will be double bagged and tagged as individual samples using the identification codes listed in this SOP (Figure 3). This sampling procedure is difficult because of fallback

from the sides of the pit, t ried detritus, etc. It may be necessary to remove the soil surrounding the scoop to the surface level of the succeeding layer to avoid these problems. It is important, however, to strive for maximum precision; taking as much time as you need. Remember that the cost of analyzing the sample you are collecting is considerable, and the validity of the results is dependant upon both the collection and the analysis.

4. All bags should be tagged with the station name, sample classification code, and area sampled as shown in Figure 1.

A complete description of the sampling location should be recorded in the collection book as shown in Figure 2. The sample classification code will be determined by the four digits defined in Figure 3.

Return samples to the NERC-LV Hot Lab. Notify the Chief, Terrestrial Monitoring Branch who will accept the samples.

SPECIAL SAMPLE COLLECTION DATA

EXACT LOCATION QUEEN CITY DIRECT

NEAREST TOWN: _____ TIME _____ DATE 7/19/73

COLL. BY JOE MONITOR

SAMPLE INFORMATION:

SAMPLE CODE - 702 - 5417

AREA - 1000 cm^2

FIGURE 1

YKL Ranch	1/5/73
Sta-771	Giles & Jake
From Back Gate at Main House, Take Rt. Fork Around Corrals and Go By Water Tank, GO 2.3 Miles South to Sample Location.	
Sample Code	1317
PAC-1SA	<5cpm
AREA	1000cm^2
Sample No.	

FIGURE 2

SOIL IDENTIFICATION CODE
PLUTONIUM SURVEY

First and Second Digit: Sub-location

These numerals will identify exact locations at one literal location description and will have varied meaning depending on location. The Project Officer will maintain a key of their relation to the station location.

Third Digit: Sample type

0: Void
1: Surface sample-depth and area may vary.
2: Profile sample-indicates layer not necessarily of surface.
3: Duplicate surface sample.
4:
5:
6:
7:
8:
9:

Fourth Digit: Depth or layer

0: Less than 1cm.
1: Surface to 1cm deep.
2: 1 to 3cm deep layer.
3: 3 to 7cm deep layer.
4: 7 to 15cm deep layer.
5: 15 to 23cm deep layer.
6: Surface to Xcm deep.
7: Surface to 5cm deep.
8:
9:

A: Surface to 2.5cm deep layer.
B: 2.5 to 5.0cm deep layer.
C: 5.0 to 7.5cm deep layer.
D: 7.5 to 10.0cm deep layer.
E: 10.0 to 12.5cm deep layer.
F: 12.5 to 15.0cm deep layer.
G: 15.0 to 17.5cm deep layer.
H:
I:
J:
K:
L:
M:

FIGURE 3

O: Surface to 5cm deep layer.
P: 5 to 10cm deep layer.
Q: 10 to 15cm deep layer.
R: 15 to 20cm deep layer.
S: 20 to 25cm deep layer.
T: 25 to 30cm deep layer.
U:
V:
W:
X:
Y:
Z: