

Field Change #1
5/15/97

Appendix 2 Collecting Additional Samples from the Mound Site CSFS

This appendix is a change (addition) to the original SAP issued for the Mound Site Source Removal on February 18, 1997, and does not constitute a complete revision to the original SAP. This change is being performed for two purposes. The first purpose is to collect statistically significant radiological data in order to remove radiological postings from around the Mound CSFS. Data generated from screening of soils during excavation activities, as well as available analytical data generated prior to excavation indicate that stringent radiological controls, and the resulting costs associated with processing soil under these controls is unnecessary.

The second purpose for this change is to collect split samples of VOC contaminated soils to evaluate a field screening GS/MS method with laboratory based GC/MS results. A field GC is currently planned to be used to support the IHSS 119 1 cleanup scheduled for the summer of 1997. The soils located in the Mound CSFS are contaminated with a similar suite of VOCs to those found at IHSS 119 1, and therefore are an excellent test candidate. This evaluation will be performed prior to the IHSS 119 1 project so that any potential problems can be identified. This data will not be used to change the planned disposition of the IHSS 133 soils.

Statistical Sampling for Radionuclides in the Consolidated Waste Feed Stockpile

Two statistical methods were used to determine the number of samples needed to confidently characterize actinide content within the Consolidated Soil Feed Stockpile (CSFS). The first was based upon the EPA DQO process (Guidance for Planning For Data Collection in Support of Environmental Decision Making Using the Data Quality Objective Process, EPA QA/G-4, Interim Final, 1993) and the second from a statistical reference textbook Quality Engineering Statistics (QES), ASQC Quality Press, Dovich, R. A., 1992). These statistical approaches incorporated the analytical results of Am-241, Pu-238, Pu-239/240, U-233/234, U-235, and U-238 obtained from the soils of Borehole 14295. When the data was evaluated per EPA QA/G-4 and QES, the U-238 sample had a higher mean value and standard deviation than the other isotopes and required a large number of samples to obtain a confidence of 90% when compared to the RFCA Tier II action levels. However, since the surrounding area of the Mound Site did not have the equivalent levels of U-238 (less than 101 pCi/g.), the data was normalized and the confidence was increased to 95% to minimize the risk of false negatives. This statistical approach therefore requires only fourteen samples to be collected. Upon receiving the results, additional statistical calculations will be performed as above and the information will be evaluated for release of the SCA on the CSFS. See Table A2-1 for supporting documentation and associated calculations.

In order to be consistent with the statistical analyses and have the data be defensible, surface soil samples will be collected as simple random samples. Sample locations will be measured off beginning from the southeast corner of the CSFS in an XY direction by 1 foot increments. Since the CSFS is approximately 40 feet by 100 feet, numbers generated from two numerical data sets (X direction 0-40 and Y direction 0-100). When paired, these numbers identify the sample locations (Table A2-2). Samples will be collected from approximately 4 inches below the surface to obtain a representative sample and emptied into a large, sealable tedlar bag and thoroughly composited. Due to the physical nature of the CSFS (uneven terrain) and that personnel will be in PPE Level B, the sample locations may have a ± 2 foot variance of desired locations.

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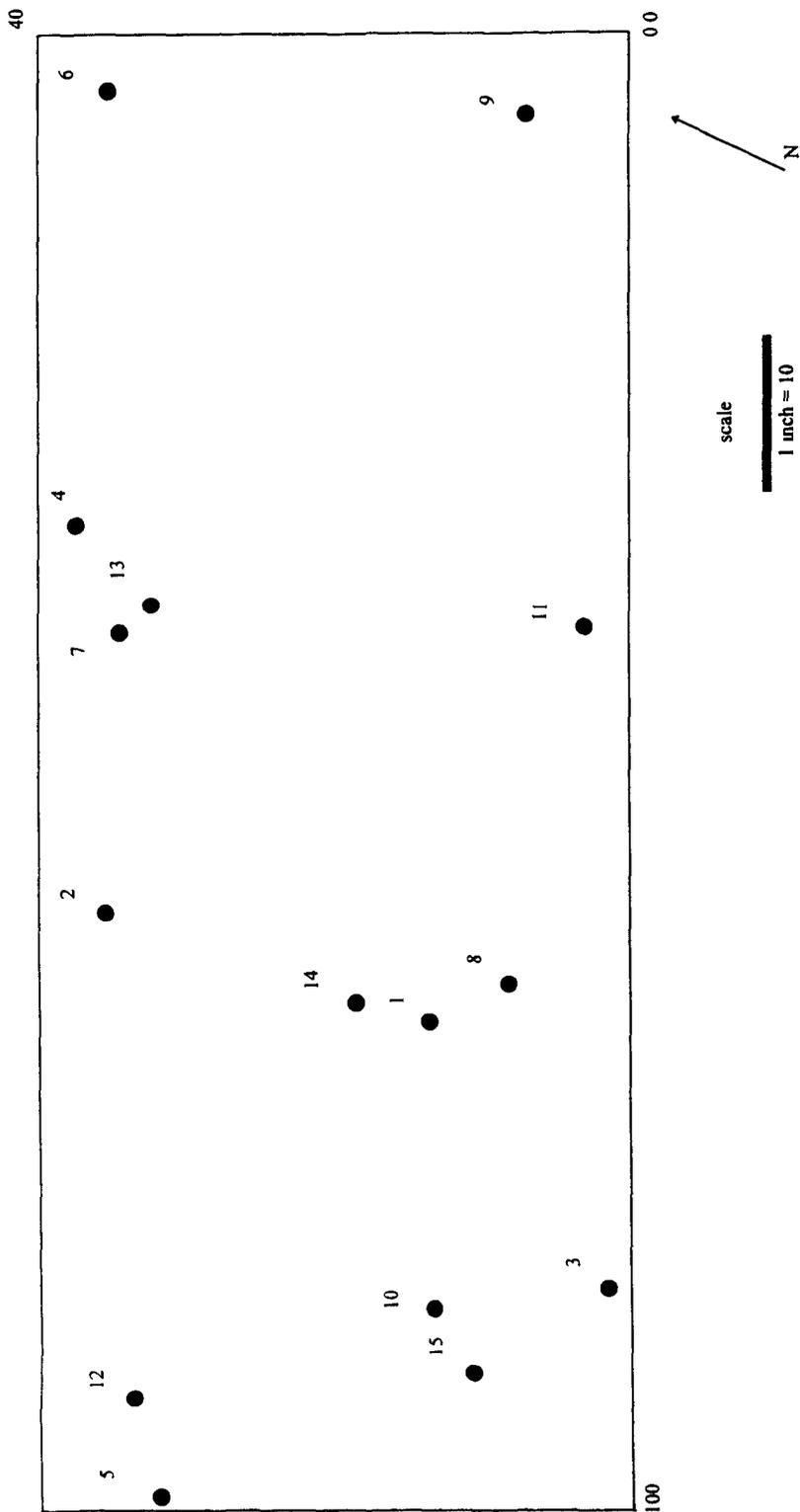
In addition to collecting the samples for radionuclides, VOCs samples will also be collected from the same locations. These samples will be used to verify the instrument comparability of a portable GC/MS and a laboratory GC/MS. No decisions will be made of the soil with respect to the VOC analysis and the final disposition of the soil. The information gathered from this effort will be used in future projects to aid in expediting decision making in the VOC screening process of excavated soils. The intent is to achieve two samples that are similar without greatly compromising their integrity. It is not expected that any relevant cross contamination will be subjected to the soils from the mixing in the plastic bags. Once the soils have been thoroughly composited, they will be transferred to their respective sample bottles and analyzed accordingly. The soil shall be of enough quantity to obtain split samples for VOCs and radionuclides.

Random sampling locations for the CSFS were generated with Microsoft 97 EXCEL software (See Table A2-2 for the sampling coordinates). The origin of the sampling coordinates is the Jersey barriers intersection at the SE corner of the CSFS. See Figure A2-1 for layout of the sample locations. Sample location 15 is a biased sample based upon the identification of a localized Hot Spot of U-238. The Hot Spot was discovered when the CSFS was constructed for the Mound Site. This location will be excavated and one sample will be collected to verify that it is below 5,000 CPM by the FIDLER.

Table A2-2 SAMPLING COORDINATES

| <u>Location</u> | <u>X Direction (ft)</u> | <u>Y Direction (ft)</u> |
|-----------------|-------------------------|-------------------------|
| 1 | 66 | 13 |
| 2 | 58 | 35 |
| 3 | 82 | 1 |
| 4 | 31 | 36 |
| 5 | 98 | 32 |
| 6 | 3 | 34 |
| 7 | 40 | 34 |
| 8 | 63 | 8 |
| 9 | 5 | 8 |
| 10 | 83 | 12 |
| 11 | 38 | 3 |
| 12 | 90 | 33 |
| 13 | 38 | 30 |
| 14 | 65 | 18 |
| 15 | 90 | 10 (approximate) |

FIGURE A2-1 IHSS 113 MOUND SITE CONTAMINATED SOIL FEED STOCKPILE SAMPLING LOCATIONS



**Volatle Screen Method and QA/QC Requirements to Support IHSS 199 1
(Sampling performed on Mound Site CSFS Soils)**

The scope of this method is to outline the VOC screening of soil samples and QA/QC requirements in support of the IHSS 119 1 excavation and soil treatment. The procedures from which this method was derived are described in detail in SW-846 Methods 8240, 8260, and 3810, and Emission Monitoring Inc /Inficon *General Field Test Method Approval Process and Specific Application for a Direct Interface GC/MS Source Test Method*

Screening Method

Holding Times

All samples shall be analyzed within 14 days of collection and most samples will be analyzed on the same day they are prepared. The nature of this project requires next-day/same-day reporting, and holding times should not be exceeded. Any sample for which the holding time is exceeded shall be reported as the minimum concentration of volatile organics.

Preparation

The samples shall be analyzed as heated water-slurry headspace soils. This procedure includes the slurry of 2.0-10.0 grams of soil with 10.0 milliliters of distilled water. Soil samples are weighed to +/- 0.1 gram into a 40 mL Midget Bubbler. Water and internal standards are added to the soil. The sample is sealed and shaken for 1-2 minutes to form a slurry. The water may be heated prior to addition, or the slurry may be heated to 70° C +/- 5° C. The samples will not require percent moisture determinations, and will be reported on an as received basis. Analysis will be performed according to the manufacturer's specifications described in the Hapsite Portable GC/MS User Guide.

Initial and Daily Calibration

A daily mass calibration tune will be performed prior to initial and daily calibrations. The instrument is tuned with 1,3,5-Tris(trifluoromethyl)benzene (Tris) and Bromopentafluorobenzene (BPFB). A three point initial calibration to determine linear range will be performed prior to analysis of samples. Practical quantitation limits of 0.5 mg/Kg are required to meet the action levels for this project. The estimated linear range for the headspace analysis is 0.5 mg/Kg to 25 mg/Kg. The initial and daily calibrations will be performed with distilled water and assuming 2.0-10.0 grams of soil.

A mass calibration tune followed by a daily calibration standard will be evaluated each day or 24 hours of operation. A mid-level standard will be used for quantitation purposes and daily calibrations. Relative response factors (RRF) for the daily standard shall be +/- 20% difference from the initial calibration. Response factors between 20 and 25% difference shall be evaluated to determine if the analyte quantitation is critical for the day's data quality objectives. Calibrations shall include, at a minimum, all target analytes required for quantitation. These compounds include Carbon Tetrachloride, 1,1-Dichloroethene, 1,1,1-Trichloroethane, Tetrachloroethene, and Trichloroethene. Internal standards shall be used in all analyses. Retention times shall not exceed +/- 6% of the daily calibration.

Sequence of Analyses

A Analyzing Initial Calibration

- 1 Tris and BPFB Tune
- 2 Initial Calibration analyzed at start of project and repeated only as necessary

B Analyzing samples immediately after initial calibration

- 1 Tris and BPFB Tune
- 2 Initial Calibration analyzed at start of project and repeated only as necessary
- 3 Blank
- 4 Samples

C Daily Analysis

- 1 Tris and BPFB Tune
- 2 Daily Calibration comparison to initial calibration performed previously
- 3 Blank
- 4 Samples