

Document Modification Request

Print or Type all information (except signatures). Process procedures in accordance with 1-A01-PROC DEV-400 Procedure Process.

25 DMR No
96-DMR-ERM-0041

1 Name/Phone/Pager/Location Edward C Mast x5757, dp 4672, Bldg T893A, FAX 2623			2 Date Aug 21, 1996		
3 Existing Document Number and Revision RF/ER-96-0041 Rev 0 Sampling & Analysis Plan			4 Document Type <input type="checkbox"/> Procedure <input type="checkbox"/> Plan <input type="checkbox"/> Other		
5 Document Title Sampling and Analysis Plan for the Pre-Remediation Investigation of the Mound, 903 Pad and T1-Trench					

6 Item	7 Page	8 Step	9 Proposed Modification
			<p>Revision of boring locations, based on inability to penetrate through the alluvium with the geoprobe See attached modification and sketch map</p>

10 Item	10a Justification (reason for modification, EJO #, TP #, etc.)
	<p>Inability to penetrate Rocky Flats Alluvium and collect soil samples for soil gas analysis requires future borings to be completed near the subcrop of the alluvium</p>

A.L. Primrose *[Signature]* for A. Primrose 8/21/96

11	<input checked="" type="checkbox"/> Process (print/sign/date) <input type="checkbox"/> Do not Process (state reason in Block 10a)	
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12	<input checked="" type="checkbox"/> Process (Complete Blocks 13-22) (print/sign/date) <input type="checkbox"/> Do not Process (state reason in Block 10a)	13 New Document/ Rev No (if new or changed)
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Complete either Section 14a or 14b as applicable For procedures attach completed Procedure Modification Worksheet from 1 A01 PROC DEV-400

14a. Type of Complete Modification	14b Changes (check all that apply)	Additional Attributes
<input type="checkbox"/> New <input type="checkbox"/> One Time-Use <input checked="" type="checkbox"/> Revision <input type="checkbox"/> Cancellation	<input checked="" type="checkbox"/> Intent Change <input type="checkbox"/> Editorial Correction <input type="checkbox"/> Nonintent Change <input type="checkbox"/> Regular <input type="checkbox"/> Interim Approval Requested (14 day limit for obtaining final approval)	<input type="checkbox"/> Temporary <input type="checkbox"/> One-Time-Use <input type="checkbox"/> Limited Distribution

15 ERM Change Control Board Required Yes No (Applicable only to new procedures revisions and intent changes)

List the reviewing disciplines in Block 16 After concurrence has been obtained (in accordance with 1 A01 PROC DEV-400) enter the name of the reviewer followed by /s/ in block 17 If the reviewer indicates *No comments*, the review signature constitutes concurrence Enter the date concurrence is obtained in Block 18

16 Organization	17 Reviewer/Concurror	18 Date	16a. Organization	17a. Reviewer/Concurror	18a. Date
ER/QA	<i>[Signature]</i>	8-21-96			
ER/SWAG	<i>[Signature]</i>	8-20-96			
ER/SWAG	<i>[Signature]</i>	8-21-96			

19 Assigned SME/Phone/Pager/Location EC Mast x5757 dp 4672 T893A	20 Cost Center	21 Charge Number	22 Requested Completion Date
23 Screen/Screen/USQD Number	24 Independent Safety Review Meeting and Date		

26 After obtaining ALL required signatures Responsible Manager's Approval (print/sign/date) (Not required for New procedures or Revisions)	27 Effective Date
EC Mast <i>[Signature]</i> 8/21/96	8/21/96
	28 Expiration Date (if applicable)

1. INTRODUCTION

96-DMR-ERM-0041

This Sampling and Analysis Plan (SAP) describes the steps necessary to collect data to characterize Trench T-1 (IHSS 108), and define the areal extent of the volatile organic compound (VOC) contamination at the Mound Site (IHSS 113), and the 903 Pad (IHSS 112) in support of early removal actions. The objective of the SAP is to describe the specific data needs, sampling and analysis requirements, data handling procedures, and associated Quality Assurance/Quality Control (QA/QC) requirements for the completion of soil gas and subsurface soil sampling. The data gathered from these activities will be used to estimate volumes of soil requiring removal for treatment or disposal.

1.1 Background

Trench T-1 (IHSS 108), is located southeast of the Protected Area fence and north of Central Avenue (Figure 1-1). The trench is roughly 150 feet long by 20 feet wide by 10 feet deep. Approximately 125 drums containing depleted uranium chips, hydraulic oil, carbon tetrachloride (CCl_4), metal turnings, distillation bottoms, copper alloy, and cemented cyanide waste are believed to have been disposed in this trench from 1954 to 1962 (RF/ER-95-0010, DOE 1995a). Previous investigations included soil gas and geoprobe sampling of the area near the trench margins, ground penetrating radar (GPR), and electromagnetic surveys (EM-31 and EM-61) over the trench. The electromagnetic survey results indicate metallic objects are buried within the trench (see Figure 3 2-1).

Due to concern about the suspected presence of pyrophoric uranium in some of the drums disposed of in Trench T-1, no intrusive activities have occurred within the trench boundaries. Groundwater contamination is found in wells down gradient from the trench, however, these wells are subject to influence from other IHSSs and do not provide sufficient information to determine if Trench T-1 is the source. Samples from within the trench are required to determine the nature of contaminants in the trench and whether these are a potential source of contamination to surface water through a groundwater pathway.

The Mound Site is located north of Trench T-1 and east of the Protected Area fence (Figure 1-1). Between 1954 and 1958, drums containing hydraulic oil and carbon tetrachloride (CCl_4) contaminated with depleted uranium and beryllium were buried at this site. Additionally, historical records show some of the buried drums contained tetrachloroethene (PCE),

DQO	How Achieved
Acquire adequate analytical data to characterize the contaminants within Trench T-1	Collect subsurface soil samples from eight borehole locations within Trench T-1 Continually monitor and examine core for high VOCs, Rads, NAPL, and visible staining Collect samples at five and ten foot depths and if NAPL or visible staining is found, analyze for VOCs, SVOCs, Radionuclides, Metals, and TPH using Level III analytical methods
Define the areal extent of contaminated soils at the Mound Site to sufficiently support planning of remedial activities	Perform Soil Gas Surveys within and surrounding the Mound Site Continually monitor and examine core for high VOCs, Rads, NAPL, and visible staining Collect soil gas samples at five foot intervals Monitor soil gas for total VOCs using a GC Collect 2 soil samples (1 within an area of high VOCs or if NAPL or visible staining is found) for laboratory analysis to confirm field observations
Define the areal extent of contaminated soils at the 903 Pad to sufficiently support planning of remedial activities	Perform Soil Gas Surveys within and surrounding the 903 Pad Continually monitor and examine core for high VOCs, Rads, NAPL, and visible staining Collect soil gas samples at five foot intervals Monitor soil gas for total VOCs using a GC Collect 10 % of samples within areas of high VOCs or if NAPL or visible staining is found for laboratory analysis to confirm field observations

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2 2 Historical Data Summary

Subsurface soil samples and soil gas samples have been collected at the Mound Site during earlier investigations The existing data confirms the presence of VOC and radionuclide concentrations within the IHSS which are above cleanup levels However, available data is not adequate for determining the lateral or vertical extent of contamination above the cleanup levels Additional data is necessary to determine the volume of contaminated material to be excavated and treated

- Field work will be performed primarily in modified-Level D Personal Protective Equipment (PPE), except where otherwise indicated by the HASP
- Soil core sampling will be performed in compliance with the Health and Safety Plan if high VOC readings occur during monitoring

3 2 Soil Boring Locations

3 2 1 Trench T-1

Eight geoprobe soil borings will be located within Trench T-1 near areas believed to contain buried drums located during electromagnetic surveys. These areas were identified during the 1995 Trenches Area and Mound Site Characterization activities by electromagnetic surveys. Boreholes will be located close to the areas believed to contain drums, but far enough away to avoid inadvertently puncturing any drums. Prior to intrusive activities, the proposed areas will be cleared using magnetometer surveys. Figure 3 2 1-1 shows the location of Trench T-1 and the proposed borehole locations based upon the results of the electromagnetic survey. These locations may be modified pending the results of magnetometer surveys prior to drilling. Depth of borings will not exceed 10 feet in Trench T-1 to avoid penetrating the bottom of the trench and creating a potential pathway for contaminant migration. Soil samples will be collected at depths of five and ten feet intervals below ground surface (BGS) unless examination of the core indicates staining or the presence of NAPL is detected. In these instances, samples will be collected from the appropriate segments of the core sample.

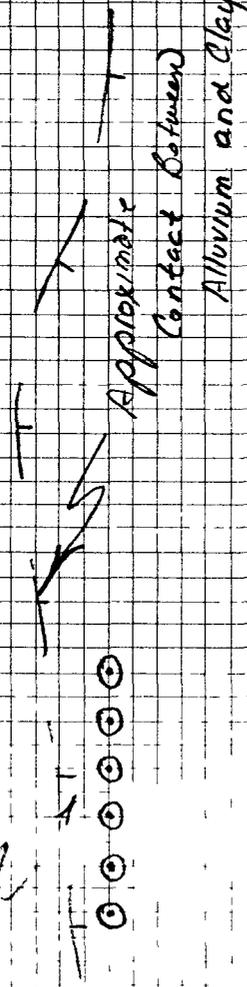
3.2.2 Mound Site

Geoprobe borings for soil gas and subsurface soils at the Mound will be located in the area of previously detected high soil gas readings, per the diagram in Figure 3 2 2-1. These locations are based upon previous sampling activities and will concentrate around the area of borehole 14295 which exhibited the highest levels of VOCs found at the Mound Site. Soil gas sample locations will be located twenty feet to the north, south, east and west of location BH14295. Samples will be collected at five feet intervals BGS to a depth of one or two feet below bedrock. If total VOCs are detected above ten ppm, then the sampling grid will be extended an additional twenty feet to the north, south, east, and west of that location and additional samples will be taken.

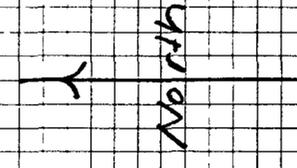
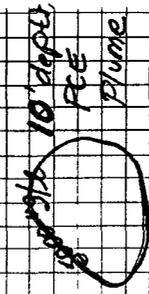
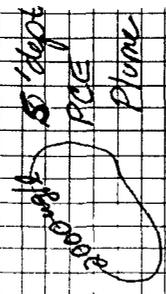
If NAPL is encountered, the step out will be reduced to 10 feet. This process will continue until the area of contamination above 10 PPM is defined. Soil samples (approximately 10%) will be collected from the areas of the highest Total VOC concentrations as confirmation samples. Geoprobe locations will be modified in

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Proposed Location
of "Fence Line"
Borings



Contours Based
on PRE Aug 96
data.



Proposed
Location
of "Fence"
Line" Borings

Previously drilled location

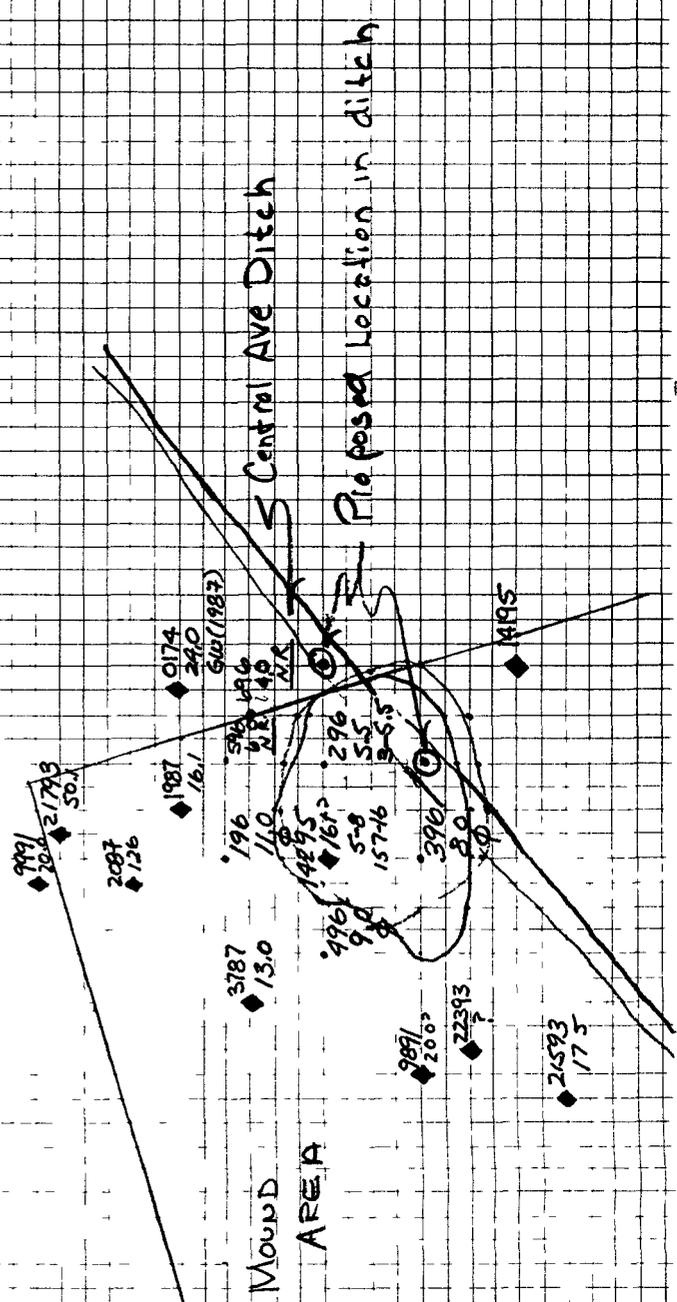
Soil Gas Boring
296 - Boring Not
110 - Total Depth
3-5.5 - Contaminated
Interval

NR: Results are
Not Back

Mound Soil Gas

1.59 = 5'

Aug 20, 1996 E.M.A.S.T.



Document Modification Request for the Sampling and Analysis Plan for the Pre-Remediation Investigation of the Mound, 903 Pad and Trench T-1 RF/ER-96-0041 Un, Rev 0

1 0 INTRODUCTION

Add to the Introduction in the first sentence (words in *italics*)

and define the areal extent of the volatile organic compound (VOC) contamination at the Mound Site (IHSS 113) *and in part establish that the Mound Site is the source of contamination of SW59*

Section 3 2 Soil Boring Locations

3 2 1 Mound Site

Add the following paragraphs to the bottom of this section

The intent of the soil borings in the Mound Area was to penetrate through the alluvium into unweathered bedrock which was projected to be 15 to 20 feet BGS. However, adverse field conditions, tight clays and large cobbles, have prohibited the collection of soil samples at depths greater than 11 feet in the first nine borings completed. Because of the inability to completely penetrate the alluvium with the geoprobe, the potential pathway for contamination can not be fully established. To further establish this pathway, a series of boring downgradient from the Mound Area and between the Mound Area and contaminated well at SW59 will be completed. All but two of the remaining proposed boring locations will be reprogrammed. The two exceptions are the borings that are located in the Central Avenue Ditch. These two boring will be completed when the ditch dries out

The remaining borings will be located in a "fence line" north of the Mound Area within 20 feet and south of the subcrop of the alluvial/bedrock contact. The alluvial/bedrock subcrop contact can be identified in the field by a observable change in slope between the more resistant alluvium versus the less resistant claystones of the bedrock.

The borings will be spaced approximately 10 feet apart and the initial location will be north of BH14295 with the exact location at the discretion of the project geologist. The depth of these borings is expected to be 10 to 15 feet but will, when possible, be completed into unweathered bedrock (see attached sketch map)

The sampling intervals and analytical suite will be the same as the initial program.

Add to the DQO Table on page 15 of the FSP

Data Quality Objectives

DQO	How Achieved
Determine if the pathway of contaminate flow coming off the Mound Area is to the north from BH14295 and if it is, define the east to west component of contaminate flow.	Using the geoprobe, collect soil samples for a GC analysis of the soil gas in the head space of the collected sample. If groundwater is present in the borings, samples will be collected. The analytical suite will be consistent with Table 3.2-2 Analytical Protocols for Soils and Soil Gas. Collect continuous core soil samples at five foot intervals. If staining or detects from the FID or PID are observed, that interval will be collected Otherwise collect the sample at the end of the five foot run.