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Field Sampling Plan To Support The Final Disposition Of Soil From The Operable Unit No. 9 Source Removal Project

Rocky Flats Environmental Technology Site

Prepared by

Rocky Mountain Remediation Services, L. L. C.

February 1997

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FIELD SAMPLING PLAN
TO SUPPORT THE FINAL DISPOSITION OF SOIL
FROM THE OPERABLE UNIT NO. 9
SOURCE REMOVAL PROJECT

February 1997

This Field Sampling Plan has been reviewed and approved by:

Scott Newsom, Radiological Engineer — 2/14/97 Date

Partha Chatterji, Project Manager — 2/14/97 Date

This Field Sampling Plan was prepared by:

Mary T. Aycock, Environmental Engineer — 2/14/97 Date

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ACRONYMS

ASTM ..... American Society for Testing Materials
CDPHE .... Colorado Department of Public Health and the Environment
COC ..... Chain of Custody
EPA ..... Environmental Protection Agency
EMD ..... Environmental Management Department
FSP ..... Field Sampling Plan
HPGe ..... High Purity Germanium
IHSS ..... Individual Hazardous Substance Site
MDA ..... Minimum Detectable Activity
OU ..... Operable Unit
PAM ..... Proposed Action Memorandum
QA ..... Quality Assurance
QC ..... Quality Control
RFCA ..... Rocky Flats Cleanup Agreement
RFEDS .... Rocky Flats Database System
RFETS ..... Rocky Flats Environmental Technology Site
SOPs ..... Standard Operating Procedures
TCLP ..... Toxicity Characteristic Leaching Procedure
TDU ..... Thermal Desorption Unit
VOCs ..... Volatile Organic Compounds
yd^3 ..... Cubic Yard

LIST OF STANDARD OPERATING PROCEDURES

Identification Number	Procedure Title
5-21000-OPS-FO.03	*General Equipment Decontamination*
5-21000-OPS-FO.13	*Containerization, Preserving, Handling and Shipping of Soil and Water Samples*

FO - Environmental Management Division (EMD) Operating Procedures Volume I Field Operations

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FIELD SAMPLING PLAN TO SUPPORT THE FINAL DISPOSITION OF SOIL FROM THE OPERABLE UNIT NO. 9 SOURCE REMOVAL PROJECT

1.0 SITE BACKGROUND

This Field Sampling Plan (FSP) was developed to support the proper disposition of soils excavated from Individual Hazardous Substance Site Operable Unit (OU) No. 9 at the Rocky Flats Environmental Technology Site. Due to its interference with Phase III of the Sewage Treatment Plant Upgrades, approximately 150 feet of the 6" vitrified clay pipe, designated as OU 9 was scheduled to be removed by excavation under a subcontract (Reference P.R. P498599). This project was conducted within an OU, but was not considered to be an Environmental Restoration activity. Before excavation of the overburden began, watertight plugs were placed in the pipe on both sides of the section to be removed. Characterization of a composite of the pipe and associated soils was taken on June 11, 1996 and June 18, 1996 in accordance with the Waste Characterization and Management Plan for Excavation of OU 9 Piping (Rocky Mountain Remediation Services, L. L. C. [RMRS] Memorandum Number GMA-002-96, dated May 7,1996). Preliminary results indicated slightly elevated levels of radioactivity in the soil; however, no hazardous constituents were detected. As a result, the soil was excavated in the summer of 1996 and placed into a total of nine (9) roll-off containers. The sampling activities associated with the OU 9 pipe removal project are addressed in the following documents:

- *Waste Characterization and Management Plan for Excavation of OU 9 Piping,* RMRS Memorandum No. GMA-002-96, dated May 7,1996.
- *Geoprobe Characterization Report for the OU 9 Pipe Excavation Project, Revision 0,* November 1996
- *Proposed Action Memorandum and Draft Modification of the Corrective Action Section of the Operating Permit for the Rocky Flats Environmental Technology Site,* November 6, 1995
- *Sampling and Analysis Plan for the Remediation of Ryan's Pit; Operable Unit 2, Revision 5,* August 28, 1995

The removed soil, stored in nine (9) roll-off containers, is slated to be characterized during the second quarter of FY 97. This soil will be sampled for radionuclide content in roll-offs prior to dispositon.

2.0 SAMPLING OBJECTIVES

The purpose of this sampling effort is to collect data to support the following objective:

To determine the types and quantities of radionuclides present in the soil of the OU 9 roll-off containers so that disposition of the soils can proceed.

Preliminary data already exists from the OU 9 Pipe and surrounding Sewage Treatment Plant (STP) Upgrade Site. Some of the data was collected before excavation, some after excavation, and some during the construction phase of the STP Upgrades to help define the radiological control area. The analysis required for this sampling activity for the characterization of the soil for radionuclides is Gamma Ray Spectrometry using a high purity germanium (HPGe) detector and a multi-channel analyzer system. The HPGe analysis will be conducted in accordance with Radiological Engineering Procedure 14.01, Operation of the Nomad Portable Gamma Ray

Spectroscopy System. This procedure has also been approved to evaluate the "put back" of potentially radiologically contaminated soils from the T-3/T-4 remediation project.

The Minimum Detectable Activity (MDA) of the HPGe detector is a function of several factors, such as count times, soil actiity, and distance between the sample and the detector. MDA values will be provided so that U^{238}, Am^{241}, Pu^{239}, U^{234}, U^{235} can be either directly measured with the HPGe detector or calculated from the direct measurement. U^{234} activity will be inferred from U^{238} activity.

A total of four samples from each roll-off container will be taken. The results of these analysis will be used to determine the characteristics and radionuclide content of the OU 9 pipe soil.

Fundamental quality control (QC) procedures are in place for the HPGe measurement system for the OU 9 Pipe Removal soils, just as they were for the soils from trenches T-3 and T-4. The primary controls of HPGe measurements resides in the pre and post energy calibration of the system based on established radiological standards. These standards are documented in Radiological Engineering Procedure 14.01. Because of the existing QCs and the justification given below, the following "typical" QC samples are not being collected for this project:

- Rinsates (equipment blanks) are not being collected because a well-established, proven procedure is being followed to decontaminate reusable sampling equipment between sample points as described in Section 5.0 of this FSP. Additionally, if problems did exist in the equipment decontamination procedure, the possible levels of introduced cross contamination would be insignificant when compared to the performance levels (Tier I or Tier II) required to evaluate disposition of the soil.

- Duplicates will be collected for a representative number of samples taken. This will provide adequate information relative to sample variability.

- Splits are not being required as part of this investigation because of the inherent QC (such as pre/post source checks) required by the HPGe operating procedure defined earlier in this Section. Further, regulators are not requiring independent, off-site analysis for the purpose of corroborating HPGe results. The HPGe methodology is established well enough to accomplish the data quality objectives of this project.

3.0 SAMPLE LOCATION AND FREQUENCY

Four composite core samples will be collected from each of approximately ten roll-off containers as recommended by Kaiser-Hill Company, L. L. C. (K H) statistical applications. To facilitate a safe sampling approach, samplers will collect samples from the sides of the roll-offs so that they are not required to climb on top of the roll-offs (e.g., required if collecting samples from the roll-offs interior). The samples will be collected near the longitudinal center lines of each roll-off container as depicted in Figure 3-1.

Four core composite subsamples will be collected from each roll-off at the longitudinal cener lines of each individual container (Figure 3-1).

The following roll-offs contain soil and will be sampled as part of this investigation: Roll-offs C-1 through C-10 (see Appendix A "Site Grading Plan").

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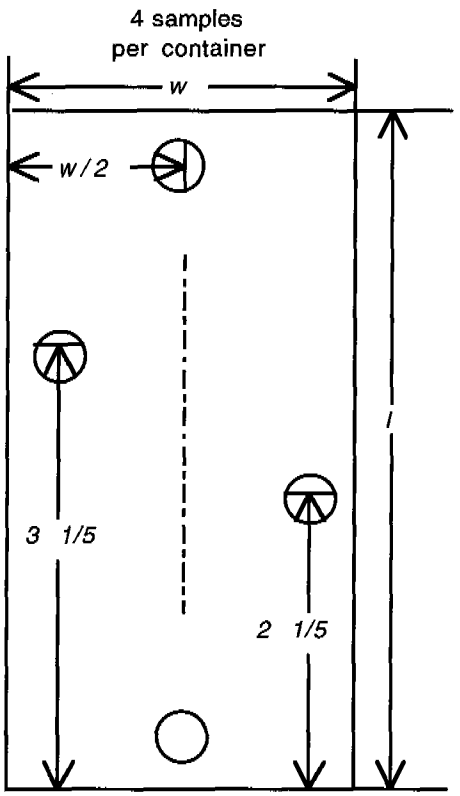
Figure 3-1 Roll-Off Container Subsample Locations



4.0 SAMPLE DESIGNATION

The site standard sample numbering system will be used for this project. Each sample will be assigned a unique nine digit number. The unique sample numbers have been assigned to the project by the Rocky Flats Environmental Database System group. The Location Codes used for this project are Roll off C-1 through C-10. Four core samples from each container will be composited to be representative of the roll-off.

After sampling, a matrix will be developed which correlates the individual sample numbers to location codes.

5.0 SAMPLING EQUIPMENT AND PROCEDURES

Depending on availability, samples will either be collected using soil augers or core samplers and plastic bags (used to homogenize subsamples). If stainless steel sampling equipment is used, the equipment will be decontaminated in accordance with EMD Operating Procedure 5-21000-OPS-FO.03, *General Equipment Decontamination, Section 5.3.1, Cleaning Steel or Metal Sampling Equipment Without Steam in the Field.* All other sampling equipment will include standard items such as chain of custody seals and forms, logbooks, general decontamination equipment, etc. Samples will be collected from the top surface of the roll-offs in a simple manner as described in Section 3.0.

6.0 SAMPLE HANDLING AND ANALYSIS

Samples collection will follow *Environmental Management Department Operating Procedures Volume/Field Operations 5-21000-0PS-FO.0.13, Containerization, Preserving, Handling, and*

Shipping of Soil and Water Samples, Volume 1. Samples will be placed in 250-milliliter wide-mouth plastic jars which the HPGe detector is calibrated for.

Field data will be recorded in a project log book. The originator shall authenticate (legibly sign and date) each completed original hard copy of data. A peer reviewer, someone other than the originator, shall perform a peer review on each completed original hard copy of data. Any modifications shall be lined through, initialed, and dated by the reviewer (in ink).

At project closeout, the original quality records (i.e., hard copies and digital records) will be submitted to RMRS Records Center. (Note: Digital files must be labeled with indelible ink and communicate, at least, the file name(s) and hardware and software platform(s).

7.0 REFERENCES

Final Proposed Action Memorandum for the Remediation of Individual Hazardous Substance Site 109, Ryan's Pit, RF/ER-0097.UN, August 24, 1995

Modification to the Proposed Action Memorandum for the Remediation of Individual Hazardous Substance Site 109, Ryan's Pit, RF/ER-0097.UN, February 21, 1996

Proposed Action Memorandum and Draft Modification of the Corrective Action Section of the Operating Permit for Rocky Flats Environmental Technology Site, November 6, 1995

Sampling and Analysis Plan for the Initiation of Ryan's Pit; Operable Unit 2, Revision 5, August 28, 1995

Completion Report for the Remediation of Individual Hazardous Substance Site 109, Ryan's Pit, Draft, May 1996

RMRS, 1995. *Quality Assurance Program Plan (QAPP).* 95-QAPP-001. Golden, Colorado. October 1995

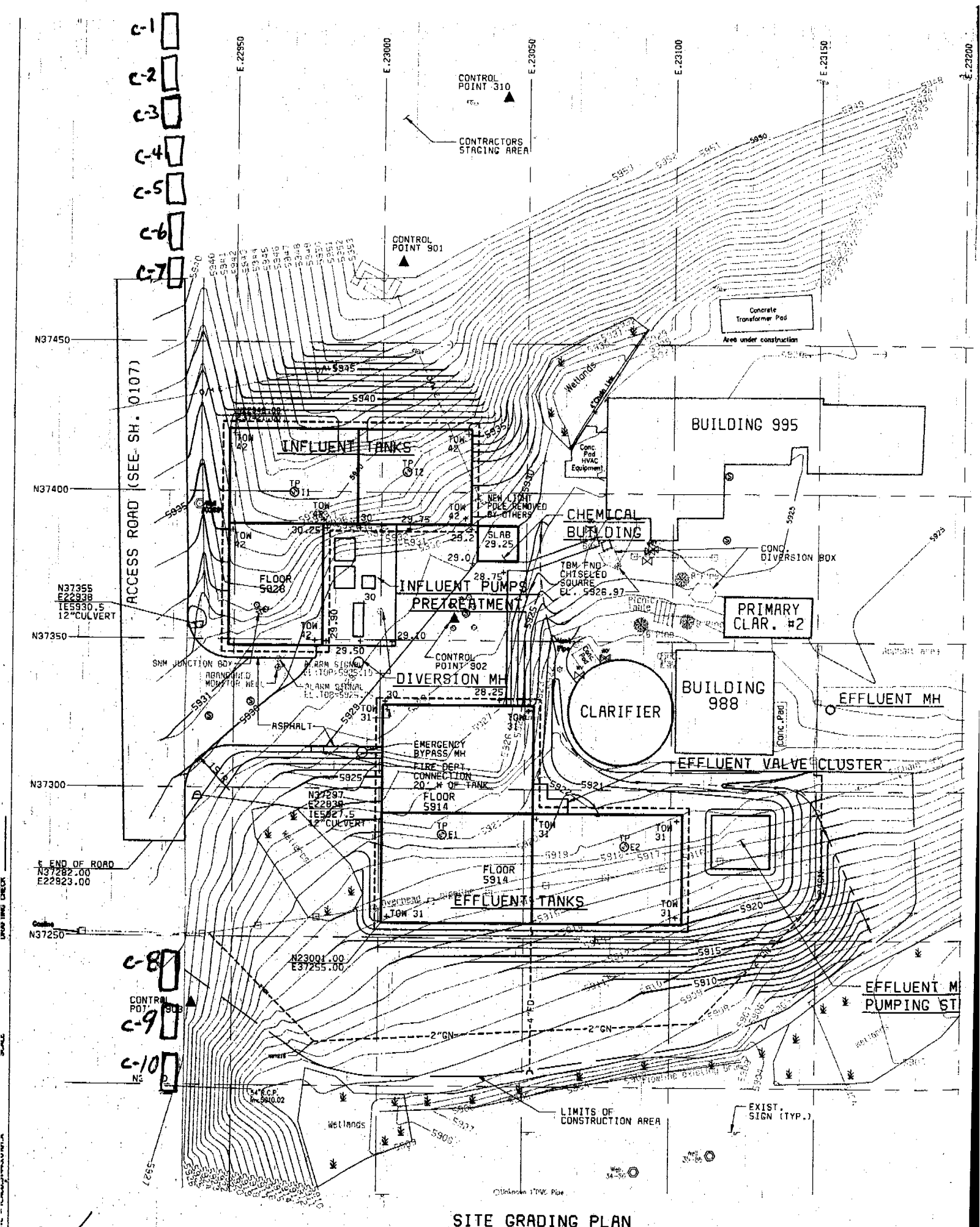
U.S. Department of Energy. *Action Levels for Radionuclides in Soils for the Rocky Flats Cleanup Agreement, Preliminary Draft,* June 27, 1996

Waste Characterization and Management Plan for Excavation of OU 9 Piping, RMRS Memorandum No. GMA-002-96, dated May 7,1996.

Geoprobe Characterization Report for the OU 9 Pipe Excavation Project, Revision 0, November 1996

Proposed Action Memorandum and Draft Modification of the Corrective Action Section of the Operating Permit for the Rocky Flats Environmental Technology Site, November 6, 1995

APPENDIX A



SITE GRADING PLAN

1" = 20'

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