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CONTRACT NO. DE-AC05-86OR21548

ENGINEERING SAMPLING PLAN TO IDENTIFY AREAS FOR REMEDIAL ACTION IN THE SOUTHEAST DRAINAGE (VICINITY PROPERTIES DA-4 AND DOC-7): ADDENDUM 1

Weldon Spring Site Remedial Action Project
Weldon Spring, Missouri

JUNE 1996 **REV. 0**

U.S. Department of Energy
Oak Ridge Operations Office
Weldon Spring Site Remedial Action Project

Prepared by MK-Ferguson Company and Jacobs Engineering Group

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APPROVALS

Engineering Manager — Date: 6-21-96

Data Administration Manager — Date: 6/24/96

Quality Assurance Manager for PDC — Date: 6-27-96

Facilities Project Manager — Date: 6-27-96

Project Director (or Deputy Project Director) — Date: 6-28-96

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Weldon Spring Site Remedial Action Project

Engineering Sampling Plan to Identify Areas For Remedial Action in the Southeast Drainage (Vicinity Properties DA-4 and DOC-7): Addendum 1

Revision 0

June 1996

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U.S. DEPARTMENT OF ENERGY
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1 INTRODUCTION

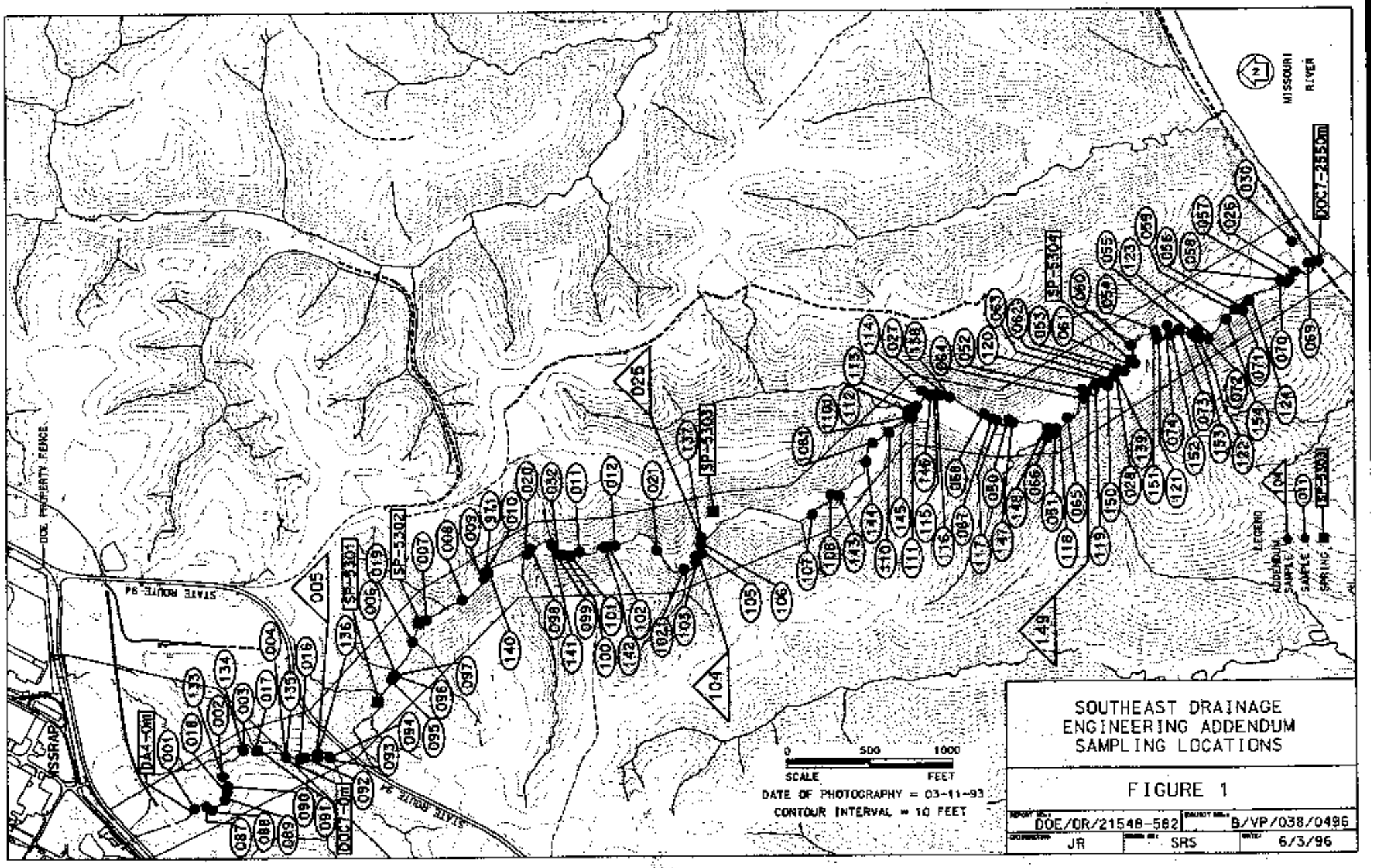
1.1 Purpose

Addendum 1 of the *Engineering Sampling Plan to Identify Areas for Remediation in the Southeast Drainage* (Ref. 1) addresses a sampling program to gather additional data in the Southeast Drainage (Missouri Department of Conservation Property 7 and Department of the Army Property 4). The sampling program will include radiological survey techniques and soil sampling to more closely define the extent of radiological contamination throughout the drainage. This document does not address cleanup decisions for sediment and soil in the Southeast Drainage. The characterization activities described in this addendum are focused on more closely defining areas to be remediated based on current evaluations of risk to human health and the environment. The DQOs and topics (e.g., quality assurance, equipment decontamination) common to both this addendum and the *Engineering Sampling Plan* (Ref. 1) will be utilized during sampling and data management.

The purpose of this addendum sampling is to determine if contaminants are present in the soil at depths greater than the vertical extent of previous sampling at three locations in the Southeast Drainage. These locations were selected because the volume of soil identified as contaminated by previous sampling was greater than 50 cu yd, and additionally, because the target cleanup concentrations were exceeded at the last depth sampled. A fourth location (SO 495149) was added, even though the volume was less than 2 cu yds, due to the presence of elevated Ra-226 at a depth of 3 ft.

1.2 Sampling Locations

Soil sampling will be conducted at four sites at various intervals along the drainage (see Figure 1-1). The sample identification numbers for these locations are SO-495005, SO-495025, SO-495104, and SO-495149. Five samples will be collected at each location. Only two samples will be collected from location SO-495149 since the boundaries of the contaminated area are small (<2 yd^3). Each location has been scanned to delineate the lateral boundaries where above background readings have been obtained. Samples will be collected at the four corners of each area, and the fifth sample will be collected directly adjacent to the original sample point. If the



SOUTHEAST DRAINAGE
ENGINEERING ADDENDUM
SAMPLING LOCATIONS

FIGURE 1

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fifth sample point is strongly biased to one end of the area, a sixth sample will be collected to alleviate the bias.

Based upon field conditions, a drill rig using a continuous sampler, a backhoe, or a hand auger will be utilized to collect samples at 6 in. intervals to a depth of 3 ft and at 1 ft intervals thereafter. Drilling or excavation will continue until one of the following occurs: surveys, using the Ludlum Model 44-9 and the Ludlum 44-10 (2x2 NaI) Detectors, indicate radiological levels consistent with established background readings; groundwater is encountered; or bedrock is encountered. Radiological levels will be determined by scanning the sample after it is removed from the sampling tube and before it is containerized and labeled.

1.3 Analyses

All soil samples will be analyzed for each of the following parameters: Ra-226, Ra-228, Th-230 and U-238. A sequential 2-digit number will be used (e.g., 01, 02, 03) to represent each 6 in. sample interval through 3 ft and each 1 ft sample thereafter, as was used in previous sampling efforts in the Southeast Drainage.

1.4 Identification of Soil Locations

Soil locations will be identified beginning with the original number associated with each site and adding the suffix B, C, D, E, or F after the numeric suffix to designate the location. SO 495005 will use suffixes D, E, F, G and H since A, B, and C were previously used. Therefore, the sample taken at the first location SO 495005 at a depth of 18 in. would be SO 495005-03D, while the second location at SO 495025 at 18 in. would be SO 495025-03C.

A walkover surface soil survey will be conducted at each sample location and the delineated area will be flagged and surveyed. The delineation will also be recorded in the ES&H logbook. Soil samples shall be placed in a Ziploc plastic bag and labeled. Soil sampling forms and chain-of-custody forms shall be completed in accordance with Procedures ES&H 4.4.5 and 4.1.2, as will sampling and mechanical equipment surveys and decontamination.

1.5 Closure Report

Upon completion of data review and verification, a closure report will be written to identify what data was collected and identify any exceptions to the addendum.

2 REFERENCES

1. MK-Ferguson Company and Jacobs Engineering Group. *Engineering Sampling Plan to Identify Areas for Remediation in the Southeast Drainage (Vicinity Properties DA-4 and DOC-7)*. Rev. 0. DOE/OR/21548-582. Prepared for the U. S. Department of Energy, Oak Ridge Operations Office. St. Charles, MO. November 1995.

PROCEDURES

ES&H 2.5.5, *Sample Preparation Procedure for Radiological Soil Samples*
ES&H 2.6.2, *Calibration and Use of Ludlum Model 44-10 (2x2 NaI) Detector*
ES&H 4.1.2, *Initiation and Generation and Transfer of Enviroinmental Chain of Custody*
ES&H 4.4.5, *Soil/Sediment Sampling*