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**TRANSMITTAL OF DRAFT REMEDIAL INVESTIGATION/FEASIBILITY
STUDY PROJECT SPECIFIC PLAN FOR OPERABLE UNIT 5 K, SOIL
SAMPLING AND ANALYSIS - REVISION 0 JULY 1994**

08/09/94

DOE-2218-94
DOE-FN EPA
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PSP

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Department of Energy
Fernald Environmental Management Project
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AUG 09 1994

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U.S. Environmental Protection Agency
Region V - 5HRE-8J
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Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
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Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY PROJECT SPECIFIC PLAN FOR OPERABLE UNIT 5 K, SOIL SAMPLING AND ANALYSIS

- Reference:
- 1) Operable Unit 5 K, Soil Sampling and Analysis (Document Change Request RIFS:94-0001)
 - 2) Letter, James A. Saric to Jack R. Craig, "Review of Groundwater Model Improvement Reports at FEMP," dated June 7, 1994.
 - 3) Fact Sheet - Feasibility Study Support Project Sampling and Analysis for Determination of K₁ In Surface Soils

This letter serves to transmit as enclosure the "Project Specific Plan (PSP) for Operable Unit 5 (OU5) K, Soil Sampling and Analysis" (Reference 1) for review and approval. The objective of this investigation is to gather additional information on the leachability of uranium in surface and subsurface soils that have been affected by air deposition of uranium outside the former Production Area. This information is needed to refine Preliminary Remedial Action Levels (PRALs) and Waste Acceptance Criteria (WAC) for use in the OU5 Feasibility Study (FS).

During an April 26, 1994 meeting between representatives of the United States Environmental Protection Agency (U.S. EPA), the Ohio Environmental Protection Agency (OEPA), the Department of Energy (DOE) and the Fernald Environmental Restoration Management Corporation (FERMCO), it was agreed that additional soil samples would be collected in order to refine the understanding of uranium mobility in surface and subsurface soils located outside the former Production Area, in areas affected by the air deposition pathway. This data will be used to develop a source loading term (K₁) which represents the

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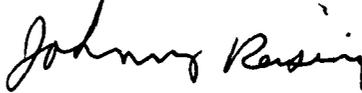
leachability of uranium from the soil. K_1 values will be determined by collecting several soil samples and conducting associated tests (Reference 2). A fact sheet summarizing the purpose and methodology for collecting data was reviewed by DOE and sent to the U.S. EPA and the OEPA in June (Reference 3). This PSP further expands on the sampling methodology, sample preparation, and analytical protocol described in the fact sheet.

In order to maintain OU5 FS scheduled milestones, accelerated implementation of field work has been necessary. At this time, the field portion of the PSP has been completed, and sample preparation, shipment and analyses are underway. It is anticipated that sample preparation for off-site analyses will be completed by the end of July.

The information derived from the K_1 study will be incorporated into the FS report to be submitted to U.S. EPA and the OEPA on November 16, 1994. Mr. J.D. Chiou is the technical lead for FERMCO in the development and use of the K_1 results. In order to quickly resolve any technical comments your respective staff members may have on the details of the K_1 study approach, DOE suggests that a technical group meeting be convened to discuss the issues with Mr. Chiou and the FERMCO staff members participating in the effort. This format will allow us to stay on schedule for the November submittal and resolve any outstanding issues in an expeditious manner. Please contact Pete Yerace at (513) 648-3161 or Kathi Nickel at (513) 648-3166 to arrange for a technical issues meeting as necessary.

If you or your staff have immediate questions regarding the PSP, please do not hesitate to call Pete Yerace or Kathi Nickel at the above listed numbers.

Sincerely,

for 
 Jack R. Craig
 Fernald Remedial Action
 Project Manager

FN:Nickel

Enclosure: As Stated

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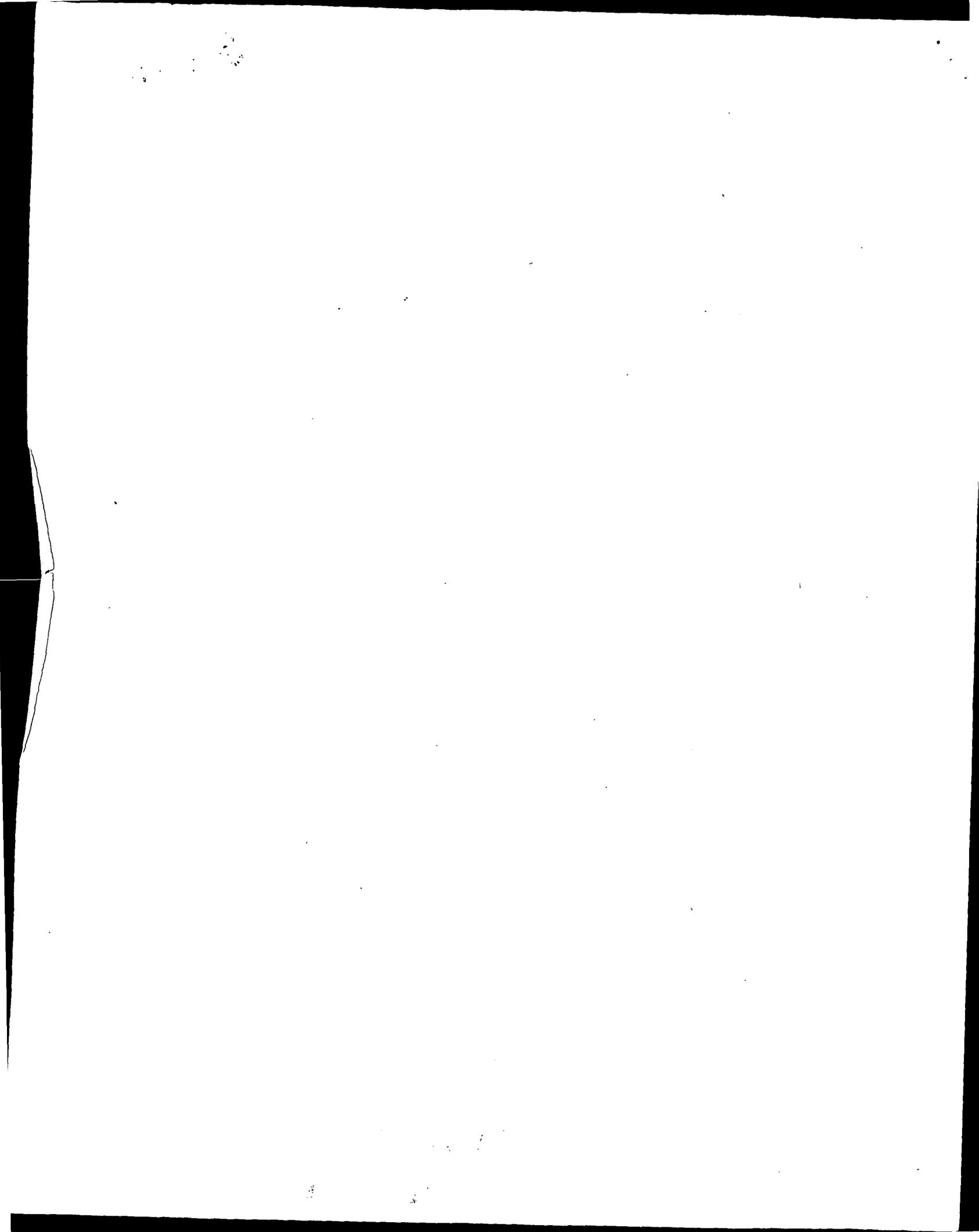
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PROJECT SPECIFIC PLAN
for
OPERABLE UNIT 5 K, SOIL SAMPLING AND ANALYSIS

REVISION 0

RI/FS WBS No. 50.03.27

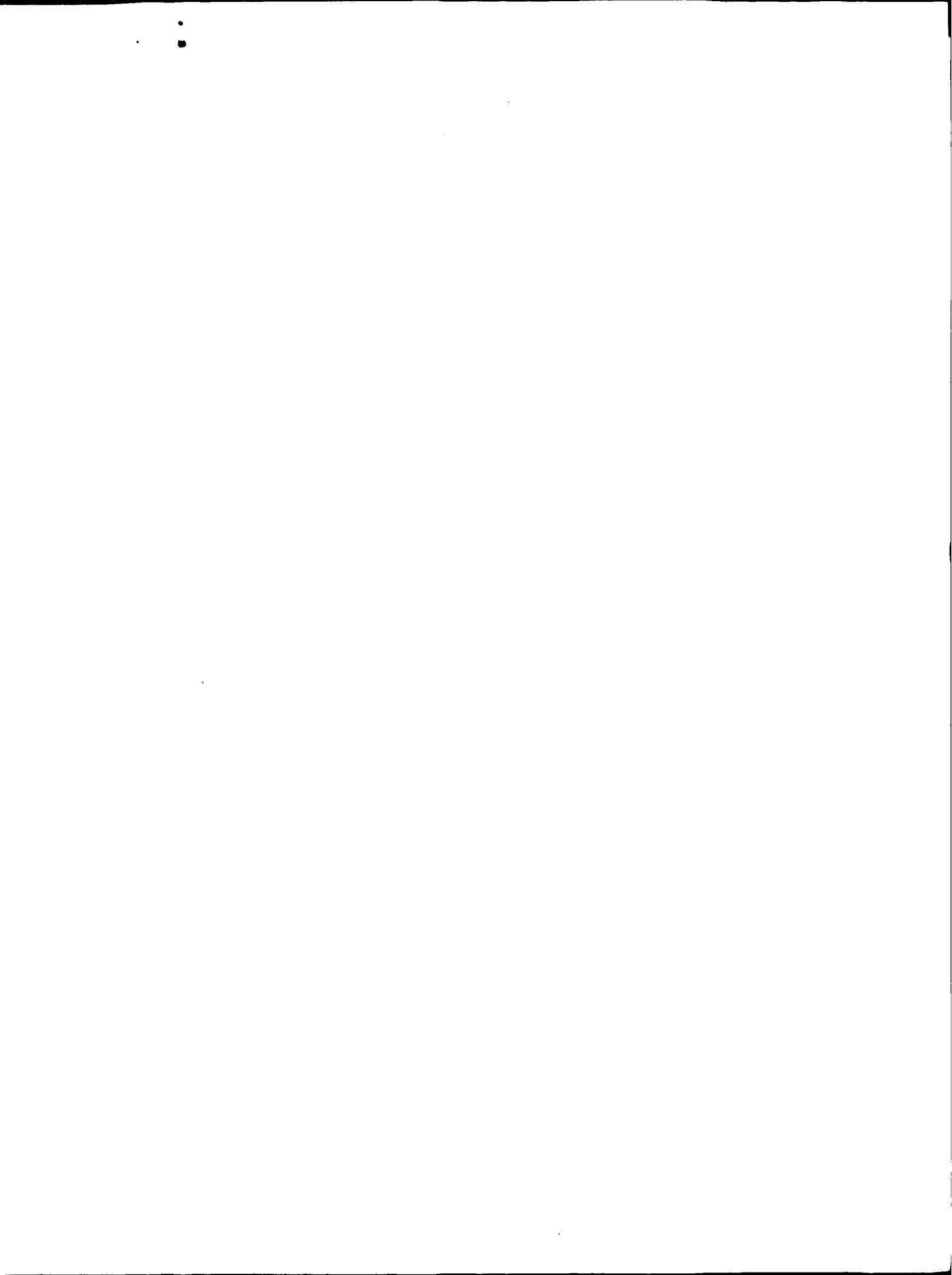
Addendum to the
Operable Unit 5 Work Plan
Remedial Investigation/Feasibility Study

Prepared by
Fernald Environmental Restoration Management Corporation

Prepared for
U.S. Department of Energy
Fernald Field Office
Under Contract DE-AC05-92OR21972

July 1994

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PROJECT SPECIFIC PLAN
for
OPERABLE UNIT 5 K₁ SOIL SAMPLING AND ANALYSIS

REVISION 0

RI/FS WBS No. 50.03.27

**Addendum to the
Operable Unit 5 Work Plan
Remedial Investigation/Feasibility Study**

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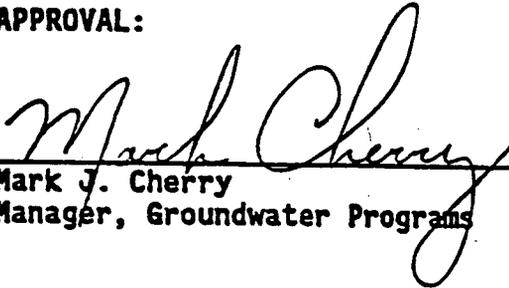
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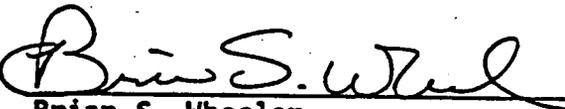
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PROJECT SPECIFIC PLAN
FOR OPERABLE UNIT 5
K, SOIL SAMPLING AND ANALYSIS
RI/FS WBS 50.03.27
REV. 0

APPROVAL:



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7/28/94
Date



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7/27/94
Date



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7-28-94
Date

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LIST OF ACRONYMS

ASL	analytical support level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE-FN	Department of Energy, Fernald Field Office
ERMC	Environmental Restoration Management Contract
FACTS	Fernald Analytical Computerized Tracking System
FAL	Field Activity Log
FEMP	Fernald Environmental Management Project
FERMCO	Fernald Environmental Management Corporation
FOG	Field Operations Group
FS	feasibility study
GIS	Geographic Information System
HSL	Hazardous Substance List
IDW	investigation-derived wastes
MDL	method detection limit
OU 5	Operable Unit 5
PID	photoionization detector
PRAL	preliminary remedial action level
PSP	Project Specific Plan
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RI/FS	Remedial Investigation/Feasibility Study
RME	Reasonable Maximum Exposure
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SPL	Sample Processing Laboratory
SWAR/CR	Sitewide Analysis Request/Custody Records
TCLP	Toxic Characteristic Leaching Procedure
WAC	Waste Acceptance Criteria

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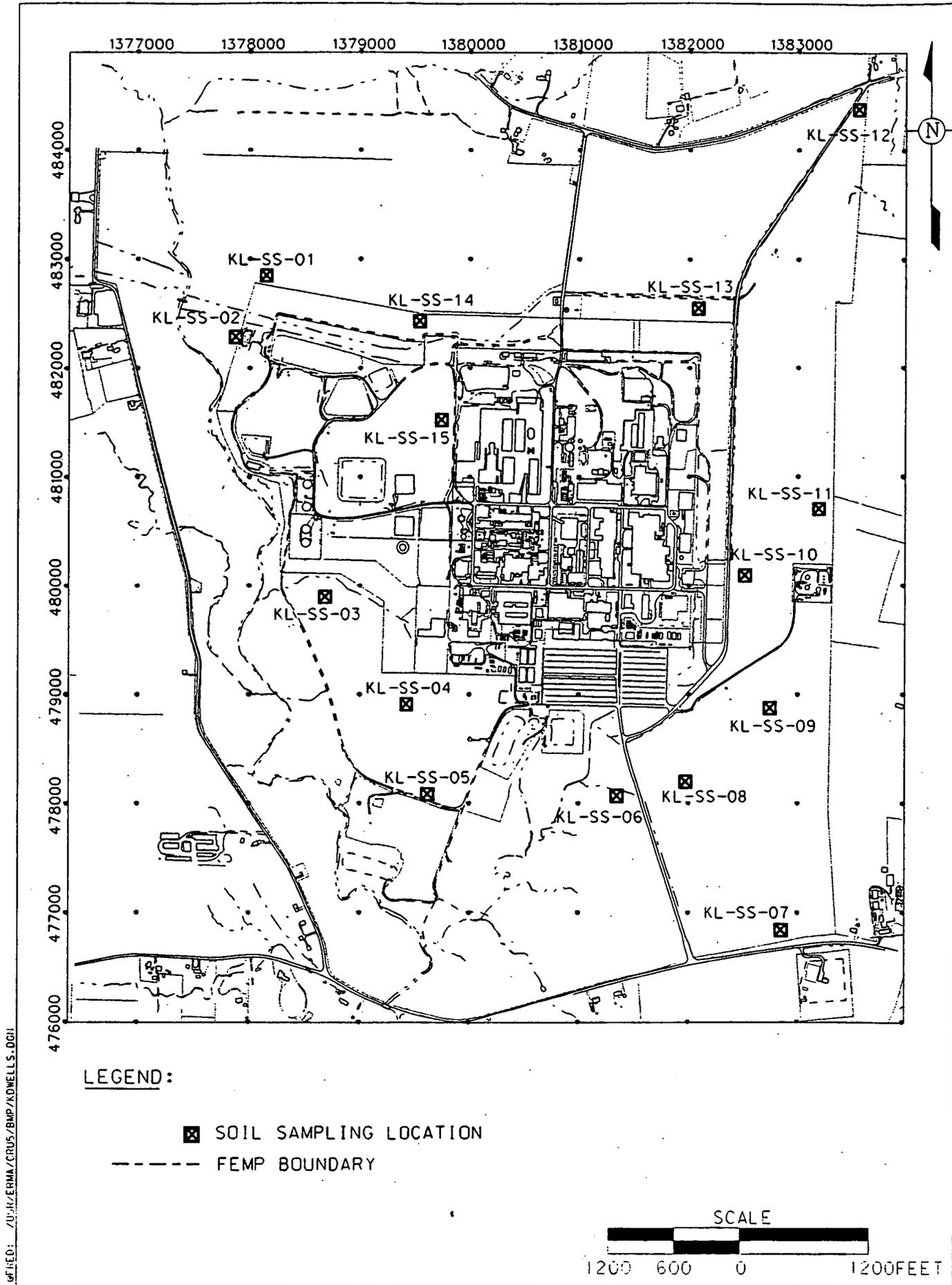
1.0 INTRODUCTION

The objective of this investigation is to gather additional information on the leachability of uranium in surface and subsurface soil that have been affected by air deposition outside the former production area of the Fernald Environmental Management Project (FEMP). This information is needed to refine preliminary remedial action levels (PRALs) and Waste Acceptance Criteria (WAC) for use in the Operable Unit 5 (OU 5) Feasibility Study (FS).

Fate and transport modeling is being conducted in the feasibility study to examine the potential for cross-media impacts to the Great Miami Aquifer from the presence of contaminants in the surface and subsurface soil. The leachability of the soil is a key component of the cross-media impact evaluation and is represented in the model by a source loading term (K_s). The rate of movement of the leached constituents in the subsurface is also a key component of the evaluation and is represented in the model through the soil-to-water partitioning coefficient (K_d). The work to be conducted through this Project Specific Plan (PSP) is focused on refining the K_s values for soil in lower-concentration contaminated areas that have been affected through the air deposition pathway. The information obtained from the investigation will be used to verify or refine the initial PRALs and WACs developed from the OU 5 Remedial Investigation (RI) data set.

Under this PSP, soil samples from six vertical intervals will be collected at 15 locations within the FEMP property boundary, but outside the former production area (Figure 1-1). The laboratory procedure to determine K_s from the collected samples is defined in Appendix A. The final draft of the OU 5 FS Report will utilize these data to verify or refine K_s as appropriate. Analytical data will also be collected to determine the effect of the soil matrix on the solubility of metals and the vertical profile of metals and radiological contamination from air deposition outside the former production area.

This PSP, an addendum to the OU 5 Remedial Investigation/Feasibility Study (RI/FS) Work Plan, has been developed under the specifications of the FEMP Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ). The PSP will guide field personnel in collection of samples required to meet the project specific data quality objectives (Appendix B). All field operations and data handling procedures will be consistent with the FEMP SCQ; sections of the SCQ are incorporated into this PSP by reference.



DATE: 7/2/82 ERMA/CROS/BMP/KDWELLS.DCH

FIGURE 1-1. K₁ SOIL SAMPLING LOCATIONS 000012

2.0 PROJECT ORGANIZATION

An Environmental Restoration Management Contract (ERMC) has been implemented at the FEMP site to manage the restoration activities, with Fernald Environmental Restoration Management Corporation (FERMCO), a wholly-owned subsidiary of Fluor Daniel, Inc., currently serving as the ERMC. FERMCO, reporting directly to the Department of Energy, Fernald Field Office (DOE-FN), will act as the main contractor for FEMP activities and coordinator of technical support and remediation subcontractors. Under the current FERMCO organizational structure, primary responsibility for implementation of the OU 5 RI/FS Work Plan Addenda will be the specific responsibility of the OU 5 Environmental Manager.

This PSP has been developed to fulfill data needs for the OU 5 FS. The OU 5 Environmental Manager has full responsibility and authority for the content and specifications in this PSP. Any changes to the activities specified in this PSP must have the approval of the OU 5 Environmental Manager prior to implementation.

Field activities are to be conducted by the Environmental Program Development and Field Operations Group (FOG) of the Environmental Division. Field activities include sample collection and preservation. Shipment and notification of the laboratories will be conducted by the Sample Management Office of the Environmental Division.

At the completion of field activities, a Task Closure Report will be prepared and submitted to the OU 5 Environmental Manager, which includes copies of all field forms, data sheets, and activity logs, as well as a written summary of the field activities noting any variances from either this PSP or SCQ procedures.

3.0 SAMPLING PROGRAM

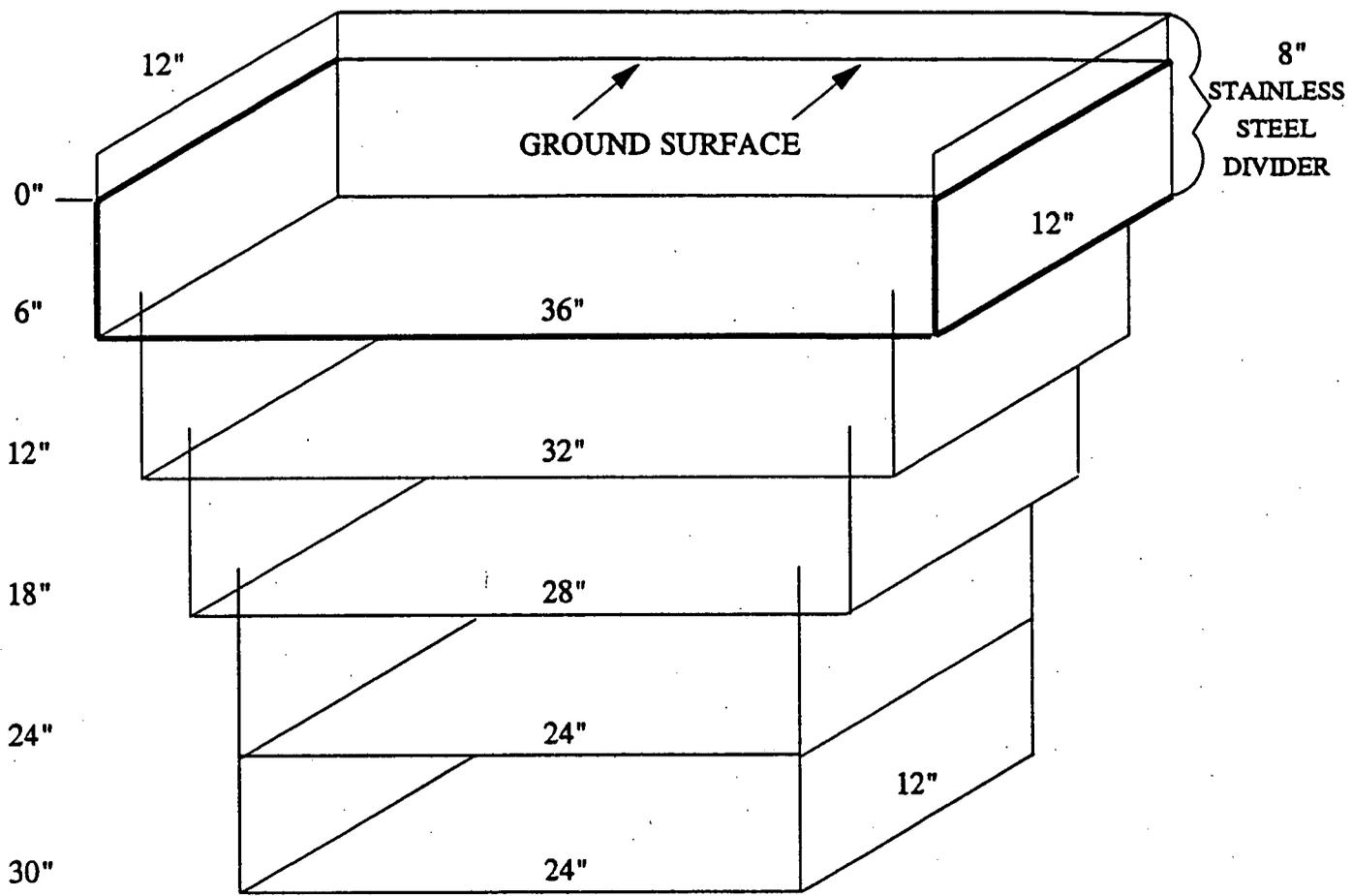
The 15 sampling locations identified in Figure 1-1 were chosen based on prevailing wind directions, source locations and soil type. Sampling locations are biased toward areas of known or suspected surface soil contamination. Soil samples will be collected at intervals from 0 to 2, 0 to 6, 6 to 12, 12 to 18, 18 to 24, and 24 to 30 inches from each sampling location. Soil intervals from 0 to 2, 6 to 12, 12 to 18, 18 to 24, and 24 to 30 inches will be collected from a trench wall outlined in Figure 3-1. The 2- to 6-inch intervals within the vertical sample column will not be analyzed and therefore will be returned to the top of the excavated area during abandonment of the sampling site. The 0- to 6-inch soil interval and soil samples for dry bulk density analysis will be collected adjacent to the vertical sample column. Further details are provided in Section 3.6.

In the event perched groundwater or other unexpected site conditions are encountered in any trench during sampling, the OU 5 Environmental Manager will be notified. An alternate sampling point will be chosen by the OU 5 Environmental Manager based on topographic considerations and distance from the original sampling point. A variance will be completed to document the sample point location change.

Table 3-1 lists the suite of analytical parameters to be performed on the soil samples. Because the analytical results will be used in risk assessment calculations, laboratory method detection limits (MDLs) and highest allowable minimum detectable concentrations have been set at or as near as technically feasible to the 10^{-6} cancer risk level for the Reasonable Maximum Exposure (RME) farmer/child risk scenario. In order for the off-site laboratory to achieve these low detection limits, large sample volumes are required for the radiological constituents. Approximately four to seven gallons of soil will be collected at each sample interval to provide an adequate sample volume for the specified analytical program. Refer to Table 3-1 for specific analytical volume/mass requirements. Table 3-2 presents the minimum amount of soil to be collected from each soil interval per location in order to achieve analytical requirements.

3.1 FIELD SCREENING

Each sample interval shall be field screened with a beta-gamma frisker and photoionization detector (PID). Field screening results for each interval shall be recorded in the "Remarks" section of the Sitewide Analysis Request/Custody Record (SWAR/CR), Sample Collection Logs and on all sample containers. All field screening equipment used during this investigation shall be operated and calibrated according to manufacturers' specifications. Written logs of equipment calibration will be documented in the project file.



Note:

1) " = Inches

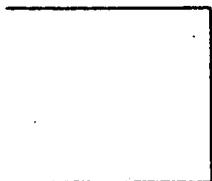
2) 0-2"

6-12"

12-18"

18-24"

24-30"



Soil from these intervals will be analyzed according to Table 3-1.

- 3) Soil from the 2-6" interval within the vertical sample column will be replaced at each location during abandonment of sampling site.
- 4) Soil from the 0-6" interval will be removed adjacent to the vertical sample column.
- 5) Soil for dry bulk density analysis will be removed adjacent to the vertical sample column.

FIGURE 3-1. EXCAVATION OF THE VERTICAL SAMPLE COLUMN

TABLE 3-1
SOIL SAMPLE ANALYTICAL PARAMETER REQUIREMENTS
K₁ SOIL SAMPLING & ANALYSIS PROGRAM

ANALYTE	LAB	ASL	NO. OF SAMPLES	MASS	HOLDING TIME	PRESERVATIVE	CONTAINER
SOIL SAMPLES:							
Total HSL Metals * (0 - 2 and 24 - 30)	R/C	D	32 †	250 grams	180 days (Hg 28 days)	Cool, 4° C	16 oz. Glass
TCLP HSL Metals * (0 - 2 and 24 - 30)	R/C	D	30	250 grams	180 days (Hg 28 days)	Cool, 4° C	16 oz. Glass
Radiological Suite ** (0 - 2 and 24 - 30)	TOS	D	30	3000 grams	180 days	None	1 1-gal. Glass
TCLP Radiological Suite ** (0 - 2 and 24 - 30)	TOS	D	30	7000 grams	180 days	None	2 1-gal. Glass
Total Organic Carbon (0 - 2 and 24 - 30)	R/C	B	30	100 grams	28 days	Cool, 4° C	4 oz. Amber Glass
Dry Bulk Density (0 - 6 and 24 - 30)	UC	N/A	30	900 grams	N/A	None	Butyrate Tube or Soil Block
Gross Alpha/Beta (0 - 2 and 24 - 30)	FEMP	A	30	100 grams	180 days	None	4 oz. Glass
KI (0 - 2 and 24 - 30)	FEMP	N/A	30	400 grams	N/A	None	16 oz. Glass
Total and Isotopic Uranium (0 - 2 and 24 - 30)	FEMP	B	15	800 grams	180 days	None	1 L. Glass
Total and Isotopic Uranium (0 - 6, 6 - 12, 12 - 18, and 18 - 24)	FEMP	B	75	800 grams	180 days	None	1 L. Glass
Total Uranium (KL-SS-11, 0 - 2) (KL-SS-09, 24 - 30)	TOS	D	2†	100 grams	180 days	None	4 oz. Glass

* HSL metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Tl, V, Zn.

** Radiological Suite includes: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-232, Th-230, U-234, U-235/236, U-238, U-Total.

† Includes two field duplicates [KL-SS-09 (24 - 30 inches) and KL-SS-11 (0 to 2 inches)].

() Sample interval in inches

N/A: Not Applicable

G/P: Glass or Plastic

R/C: RCRA/CERCLA Laboratory

TOS: Radiological Task Order Subcontract

FEMP: FERMCO Laboratory

UC: University of Cincinnati Geotechnical Laboratory (On-Site)

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TABLE 3-2
FIELD SOIL COLLECTION AND CONTAINERIZATION PER SAMPLE LOCATION

SOIL INTERVAL (inches)	CONTAINERS
0 - 2	7 1-gallon Glass
0 - 6	4 1-gallon Glass
6 - 12	4 1-gallon Glass
12 - 18	4 1-gallon Glass
18 - 24	4 1-gallon Glass
24 - 30	7 1-gallon Glass

Note: Additional core or soil block will be collected at each location for the 0- to 6-inch and the 24- to 30-inch intervals for dry bulk density.

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RJ/FS Work Plan Addendum

July 1994

FEMP RJ/FS Work Plan

3.2 FIELD EQUIPMENT

Equipment required to perform the tasks outlined in this PSP are listed in Appendix C. Any variance from the required sampling technique, PSP requirements, or standard operating procedures shall be approved prior to implementation by the OU 5 Environmental Manager and the FOG Manager as prescribed in Section 15.4 of the SCQ. Changes to the program shall be noted in the project files and on an approved Variance Request Form.

3.3 SAMPLE NUMBERS

The soil collected from each interval will be placed in one-gallon glass containers and custody sealed. Sample containers will be marked with the appropriate sample number (Appendix D), sample location, depth interval, sample date and time, field screening results, and samplers' initials. Soil collected for dry bulk density analysis will be either containerized in butyrate tubes or plastic, depending on sample methodology. Samples will be marked with sample number (Appendix D), sample location, depth interval, sample date and time, field screening results, and samplers' initials.

3.4 LOCATION SURVEY

Following sampling activities, the coordinates of each sample location will be surveyed to the nearest 0.01 foot relative to the 1927 State Planar Coordinates by a State of Ohio Registered Professional Land Surveyor. Surveyed points will be integrated into the existing FEMP Geographic Information System (GIS) and incorporated into the Sitewide Environmental Database (SED).

3.5 SAMPLE TRANSPORT

Each sample interval will be transported to the FERMCO Laboratory Building for sample preparation. The SWAR/CR will be completed in the field prior to transportation to the FERMCO Laboratory Building. The SWAR/CR completed in the field will be used to document, track, and ensure the integrity of material removed from the field until compositing and aliquoting for analysis.

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RI/FS Work Plan Addendum

July 1994

FEMP RI/FS Work Plan

3.6 SAMPLING METHODOLOGY OF VERTICAL SAMPLE COLUMN

A trench will be excavated with a backhoe at each of the 15 locations to expose a vertical soil column for sampling. The trench will be approximately 3.5 feet deep, 5 feet long, and 2.5 feet wide at the bottom. The trench wall opposite the wall designated for sampling will be graded away for safe access and egress. During excavation of the trench, the upper six inches of excavated soil will be maintained separately from soil removed at deeper elevations. The upper six inches of soil will be placed on plastic sheeting and returned to the top of the trench as the excavated material is replaced during abandonment of the sampling site.

Excavation areas will be backfilled as soon as possible after sample collection and shall not remain open over night. The trench wall to be sampled will be photographed and lithologically described on a Lithologic Log by the Field Geologist.

The trench wall to be sampled will be prepared by removing approximately one inch of soil (one inch into the trench wall face) from the trench wall using stainless steel scoops. Soil will be removed beginning at ground surface and working to the bottom of the trench. Removing this soil will reduce the chances of cross contamination which might have occurred as the trench was excavated.

At the ground surface, soil will be collected from an area approximately 3 feet wide by 1 foot deep into the trench wall. The size of this area may vary in order to collect enough soil from the 0- to 2-inch interval. The vertical sample wall will then taper inward slightly at each sample interval below ground surface in order to place nested three-sided stainless steel dividers into the sample column (Figure 3-1). The stainless steel dividers will isolate soil intervals, preventing cross contamination as sampling proceeds down the trench wall. Sampling scoops will be dedicated to discrete sample intervals to prevent cross contamination.

The 0- to 2-inch intervals will be collected from an area approximately 3 feet by 1 foot. Vegetation will be stripped from the sampling area, taking care to minimize the removal of soil. Following removal of vegetation from the sampling area, field screening will be performed as described in Section 3.1. The 0- to 2-inch soil interval shall be collected from the sampling area using stainless steel scoops marked at the 2-inch depth to ensure that the correct sample interval is removed. Samples will be collected in accordance with the requirements specified in Appendix K, Section 5.1 of the SCQ and placed in one-gallon glass containers.

The 2- to 6-inch intervals from the sample column will not be analyzed and will be placed on plastic to be returned to the area after backfilling has occurred. The 2- to 6-inch intervals will be removed as follows:

- The 2- to 5-inch intervals will be removed with stainless steel scoops.
- After soil is removed to five inches in depth, an eight-inch high, three-sided stainless steel divider will be placed in the resulting sample column and driven to a depth of six inches below the ground surface.
- A clean, decontaminated scoop will be used to remove the 5- to 6-inch intervals.

Depth measurements will be checked using scoops marked with the designated depth of soil to be removed. The 6- to 12-inch sample intervals and all subsequent sample intervals (12 to 18 inches, 18 to 24 inches and 24 to 30 inches) will be collected as follows:

- Before soil is removed, the top surface of the sample interval and the sample column face will be field screened as described in Section 3.1.
- The top five inches of the sample interval will be removed using a stainless steel scoop and placed directly into one-gallon glass containers.
- An eight-inch high, three-sided stainless steel divider will be placed in the sample column and driven down one inch to the bottom of the sample interval.
- The remaining one inch of each sample interval will be removed using a new scoop and placed into one-gallon glass containers.
- The sample containers will be custody sealed and labeled as specified in Section 3.3.

Depth measurements will be checked using scoops marked with the designated depth of soil to be removed (five inches or one inch). The sample interval depth will be checked periodically using a level and graded measuring tool.

3.6.1 DUPLICATE SAMPLE COLLECTION METHODOLOGY

Duplicate analyses will be performed on the soil samples collected at Location KL-SS-09 for the 24- to 30-inch interval and at Location KL-SS-11 for the 0- to 2-inch interval. The amount of soil described in Table 3-2 is sufficient to perform the required duplicate analyses. All soil will be homogenized with the respective sample intervals in the FERMCO Laboratory and split into duplicate samples. Duplicate samples will be analyzed for Hazardous Substance List (HSL) metals and total uranium at an off-site laboratory.

3.7 SAMPLING METHODOLOGY OUTSIDE THE VERTICAL SAMPLE COLUMN

The 0- to 6-inch intervals and the soil for the dry bulk density analysis will be collected adjacent to the vertical sample column, approximately within a three-foot radius. Soil will be collected by either using a stainless steel coring device or by using stainless steel scoops. The most appropriate time efficient sampling methodology will be determined by the Field Geologist.

Vegetation will be stripped from the sampling area, taking care to minimize the removal of soil during this process. If the coring device is used, approximately ten cores from 0 to 6 inches will be collected. If stainless steel scoops are used, the methodology described in Section 3.6 will be used. Enough soil will be collected, using either methodology, in order to fill four one-gallon glass containers. Soil will be collected in accordance with the requirements specified in Appendix K, Section 5.1 of the SCQ. The soil collected from 0 to 6 inches will be field screened according to Section 3.1, placed in one-gallon glass containers, custody sealed and labeled as described in Section 3.3.

Additional soil will be collected at the 0- to 6-inch and 24- to 30-inch intervals at each sample location to analyze for dry bulk density. Vegetation will be stripped from the sampling area, taking care to minimize the removal of soil. Either a coring device containing a butyrate tube or a stainless scoop will be used to remove approximately a 3- by 3- by 6-inch soil sample from the 0- to 6-inch and the 24- to 30-inch intervals.

If the coring device is used, it shall be advanced from 0 to 6 inches in depth immediately adjacent to the vertical sample column. The butyrate tube will then be removed from the borehole and shall be placed on clean plastic. The tube will be cut to retain the 6-inch soil sample. A coring device will then be used to remove soil from 6 to 24 inches in depth. This material will be placed aside and will be returned to the excavation during backfilling. A coring device containing a new butyrate tube will then be advanced from the 24 to 30 inches and removed from the borehole. The butyrate tube will be placed on plastic and the appropriate length of tube will be cut to retain the 24- to 30-inch sample. Both the 0- to 6-inch and the 24- to 30-inch intervals will then be field screened as defined in Section 3.1 on the top and bottom exposed surfaces of each core. The cores will then be capped, custody taped and labeled as described in Section 3.3.

If a stainless steel scoop is used, a 3- by 3- by 6-inch soil block will be removed from the trench wall adjacent to the vertical sample column. The soil from both the 0- to 6-inch and the 24- to 30-inch intervals will be field screened according to Section 3.1, wrapped in plastic, and labeled as defined in Section 3.3.

3.8 SAMPLE PREPARATION

Sample Preparation will be conducted by FERMC0 staff at the on-site laboratory.

3.8.1 Soil Sample Preparation (0- to 2-inch and 24- to 30-inch intervals) collected within Sample Column

Soil samples collected from the 0- to 2-inch and 24- to 30-inch intervals will be removed from the one-gallon sample containers and placed onto clean stainless steel pans to dry. The stainless steel drying pans will be dedicated to each interval (0 to 2 and 24 to 30 inches) and location. The soil will be broken up and dried (either by air or oven) for approximately 24 hours. Following drying, the remaining larger soil aggregates will be broken down and the total volume of soil from each sample interval will be weighed. The mass should be approximately 15,000 grams per interval to provide sufficient sample mass for the analytical program requirements specified in Table 3-1. Mass measurements will be recorded in the Field Activity Logs (FALs). If the mass is insufficient, the Field Geologist will be contacted to retrieve a core sample from the location and interval of interest.

Each soil sample will be passed through a No. 10 (2.00 millimeter) stainless steel sieve into a stainless steel container. Any material other than soil retained on the sieve will be considered waste and will be weighed and disposed of as indicated in Section 7.0. The mass will be recorded in the FALs.

Soil from each sample interval will then be homogenized using a sample splitter or a riffle sampler (Appendix C). The sample splitter/riffle sampler separates the sample into multiple fractions of approximately equal volume. The sample fractions will be combined and the process will be repeated for each sample interval. The soil from each interval will be passed through the sample splitter/riffle sampler twice. Stainless steel containers will be used to containerize soil as it is passed through the sieve and the sample splitter/riffle sampler. To reduce the potential for cross contamination, all sieves, sample splitters/riffle samplers, and stainless steel containers will be dedicated to the 0- to 2-inch intervals and the 24- to 30-inch intervals, respectively.

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After sample preparation is complete, the sample material will be placed into the containers specified in Table 3-1. Containers will be assigned Fernald Analytical Computerized Tracking System (FACTS) sample numbers. The SWAR/CR will be completed and the samples will be transported to FERMCO Sample Processing Laboratory (SPL).

Following sample preparation, any remaining soil will be containerized in one-gallon glass containers, and archived as described in Section 3.9. Homogenization equipment will be decontaminated prior to and after completion of the homogenization of each sample interval as defined in Section 5.0.

3.8.2 Duplicate Soil Sample Preparation Methodology

Duplicate analyses will be performed on samples collected at Locations KL-SS-09 and KL-SS-11 at the 24- to 30-inch intervals and the 0- to 2-inch intervals, respectively. The samples will be prepared as described in Section 3.8.1.

At Location KL-SS-09, a duplicate sample will be prepared for the 24- to 30-inch intervals. After all the soil from the 24- to 30-inch intervals has been prepared, the sample material will be containerized as specified in Table 3-1 with the addition of a duplicate sample for HSL metals and total uranium analyses.

At Location KL-SS-11, a duplicate sample will be prepared for the 0- to 2-inch intervals. After all the soil from the 0- to 2-inch intervals has been prepared, the sample material will be containerized according to Table 3-1 with the addition of a duplicate sample for HSL metals and total uranium analyses.

Duplicate samples will be placed in the containers specified in Table 3-1. Containers will be assigned FACTS sample numbers. The SWAR/CR will be completed and the samples will be transported to FERMCO SPL.

3.8.3 Sample Preparation for Dry Bulk Density Analysis

Either butyrate tubes or 3- by 3- by 6-inch soil blocks wrapped in plastic will contain the 0- to 6-inch and 24- to 30-inch intervals from each location to be analyzed for dry bulk density. FACTS sample numbers will be assigned and labels placed on each tube or soil block. The SWAR/CR will be completed and samples will be transported to SPL to be transported for on-site analysis of dry bulk density.

3.8.4 Soil Sample Preparation for the 0- to 6-inch, 6- to 12-inch, 12- to 18-inch , and 18- to 24-inch Intervals

After all 0- to 2-inch and 24- to 30-inch soil samples have been collected and homogenized for every location, the remaining intervals (0 to 6, 6 to 12, 12 to 18, and 18 to 24 inches) will be dried, weighed, sieved, and homogenized following the same preparation procedure described in Section 3.8.1. This soil will be analyzed for total and isotopic uranium.

3.9 ARCHIVE SAMPLE STORAGE

All archive sample containers will be stored in a secure location in accordance with Section 7.2.3 of the SCQ.

3.10 DOCUMENTATION REQUIREMENTS

In addition to the custody records, a Sample Collection Log shall be completed which summarizes all samples collected from a single borehole. All field work shall be documented in the FALs. A Lithologic Log shall be completed for each location.

Example field forms are contained in Appendix E. Copies of all completed field paperwork will be provided to the OU 5 Environmental Manager on a daily basis. All field documentation shall be completed by the Field Geologists.

3.11 ANALYTICAL PARAMETERS

Samples collected from 0 to 2 inches and 24 to 30 inches and field QA/QC samples will be analyzed at the FERMCO Laboratory for gross alpha/beta in order to be shipped to an off-site laboratory. The FERMCO Laboratory will analyze a portion of the soil samples collected from 0 to 2, 0 to 6, 6 to 12, 12 to 18, 18 to 24, and 24 to 30 inches for total and isotopic uranium. On-site analyses will also be performed for dry bulk density (0-to 6-inch and 24-to 30-inch intervals) and K_d (0- to 2-inch and 24- to 30-inch intervals).

Off-site laboratories will analyze the samples collected from 0 to 2 inches and 24 to 30 inches for total organic carbon (TOC) analysis, HSL metals, and the radiological suite listed in Table 3-1. An aliquot of the soil sample will undergo the Toxic Characteristic Leaching Procedure (TCLP) and the leachate analyzed for HSL metals and the same radiological suite as the soil samples.

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Rinsates, field blanks, and duplicates will be analyzed for HSL metals and total uranium at the off-site laboratory. A complete summary of parameters, Analytical Support Levels (ASL), container and preservation requirements, and sample holding times is provided in Tables 3-1 for soil duplicates and Table 3-3 for rinsates and field blanks.

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TABLE 3-3
FIELD QUALITY CONTROL SAMPLE PARAMETER REQUIREMENTS
K, SOIL SAMPLING & ANALYSIS PROGRAM

ANALYTE	LAB	ASL	NO. OF SAMPLES	MASS	HOLDING TIME	PRESERVATIVE	CONTAINER
RINSATE:							
Total HSL Metals	R/C	D	6	N/A	180 days (Hg 28 days)	Cool, 4° C HNO ₃ < 2	1 L G/P
Total Uranium	TOS	D	6	N/A	180 days	Cool, 4° C HNO ₃ < 2	1 L Glass
Gross Alpha/Beta	FEMP	A	6	N/A	180 days	None	120 ml G/P
FIELD BLANK:							
Total HSL Metals	R/C	D	15	N/A	180 days (Hg 28 days)	Cool, 4° C HNO ₃ < 2	1 L G/P
Total Uranium	TOS	D	15	N/A	180 days	Cool, 4° C HNO ₃ < 2	1 L Glass
Gross Alpha/Beta	FEMP	A	15	N/A	180 days	None	120 ml G/P

* HSL metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Tl, V, Zn.

** Radiological Suite includes: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-232, Th-230, U-234, U-235/236, U-238, U-Total.

N/A: Not Applicable

G/P: Glass or Plastic

R/C: RCRA/CERCLA Laboratory

TOS: Radiological Task Order Subcontract

FEMP: FERMC O Laboratory

UC: University of Cincinnati Geotechnical Laboratory (On-Site)

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4.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

All FOG sampling programs follow protocol established in the SCQ.

4.1 PROJECT REQUIREMENTS FOR SELF-ASSESSMENTS, SURVEILLANCES

Self-assessment and independent assessments of work processes and operations shall be undertaken to assure quality of performance. Self-assessment shall be performed by the Environmental Division. Self-assessment activities shall encompass technical and procedure requirements, and may be conducted at any point in the project.

Independent assessment shall be performed by the FEMP Quality Assurance (QA) organization by conducting surveillances. As a minimum, one surveillance shall be conducted, consisting of monitoring/observing on-going project activity and work areas to verify conformance to specified requirements. Surveillances shall be planned and documented in accordance with Section 12.3 of the SCQ.

4.2 FIELD QUALITY CONTROL SAMPLES

Three types of field quality control (QC) samples will be collected and analyzed: field blanks, equipment rinsates, and field duplicates.

A field blank will be prepared at each of the 15 locations in accordance with Section K.4.6 of the SCQ. The sample containers (Table 3-3) containing organic-free de-ionized water will remain open during sampling activities at the location. Field blanks will be analyzed for HSL metals and total uranium. Sample numbers are listed in Appendix D.

Equipment rinsate samples will be collected from decontaminated sampling and homogenization equipment in accordance with Section K.5.4 of the SCQ. Rinsate samples will be collected from equipment used at the initial sample collection location prior to commencement of sampling. In addition, rinsate samples shall be collected and analyzed at a frequency of 1 per 20 samples or any fraction thereof. One rinsate sample will also be collected prior to commencement of homogenization and at a frequency of 1 per 20 samples or fraction thereof. In summary, three rinsate samples will be collected during field collection and three rinsates will be collected during homogenization. Samples collected using the rinsed equipment following collection of the rinsate sample will be documented by sample numbers in FALs. Each rinsate sample will be analyzed for

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HSL metals and total uranium by the off-site laboratory. Sample parameters, container and preservative requirements, and holding times are summarized in Table 3-3. Sample numbers are listed in Appendix D.

Duplicate samples will be collected at Location KL-SS-09 from 24 to 30 inches and KL-SS-11 from 0 to 2 inches. The duplicate and actual sample will be aliquotted after preparation in the laboratory to assure homogeneity of the samples. Duplicate samples will be analyzed for HSL metals and total uranium by an off-site laboratory. Sample parameters, container and preservative requirements, and holding times are summarized on Table 2. Sample numbers are listed in Appendix D.

5.0 EQUIPMENT DECONTAMINATION

Decontamination is completed to limit the introduction of contaminants from equipment to sampled media, limit cross-contamination between sampling points, and protect worker safety and health. Wherever possible, dedicated sampling equipment will be used. Sampling equipment shall be thoroughly decontaminated prior to use and/or transport to the field sample site. The coring device will be thoroughly decontaminated after completion of each individual borehole. Homogenization equipment will be thoroughly decontaminated prior to and after completion of homogenization of each individual sample interval. The decontamination of all sampling equipment shall be performed to Level II decontamination, Section K.11 of the SCQ.

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6.0 HEALTH & SAFETY CONSIDERATIONS

FOG technicians will conform to all precautionary surveys performed by the employees representing site Safety, Industrial Hygiene, and Health Physics. Concurrence to all applicable safety permits (indicated by signature of the FOG technicians assigned to the prospective project) is expected of FOG technicians in the performance of their assigned duties.

The FOG Senior Technician and responsible sampling team lead will ensure that all EM technicians performing sampling related to any project has read all applicable surveys that protect worker safety and health. FOG technicians who do not sign the applicable health and safety survey forms shall not participate in the execution of sampling activities related to the completion of assigned project responsibilities. A copy of all applicable safety permits/surveys issued for worker safety and health shall be posted at the field locations. A Project-Specific Health and Safety Plan is contained in Appendix F.

Prior to implementation of field work, a FEMP Penetration Permit will be obtained. The permit process involves comparing proposed locations to the underground utility site database. No intrusive sampling will be conducted without a valid Penetration Permit being obtained prior to performance of the work.

Health and safety coverage of the field program will be provided by a technician monitoring the activities of the field crew. Proper equipment to be used for health and safety monitoring and personnel protection and criteria for the selection of monitoring equipment and protective clothing are outlined in the Project-Specific Health and Safety Plan contained in Appendix F.

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7.0 INVESTIGATION-DERIVED WASTES

During completion of sampling activities, FOG sampling teams may generate contact wastes and decontamination waste. Following completion of sampling, the FOG sampling team shall place all contact wastes into properly labeled bags and disposition in accordance with appropriate FEMP waste management policies.

Following completion of sampling, the FOG sampling team shall decant all decontamination solution into a 55-gallon drum at the exclusion area. Disposition of the investigation-derived wastes (IDW) will be completed according to Environmental Monitoring Procedure EP-SMS-013, "Disposition of Investigation-Derived Wastes" (Appendix G). No sampling locations for this investigation are within FEMP Hazardous Waste Management Unit or Solid Waste Management Units.

Sample material retained on the No. 10 sieve during the homogenization process will be containerized per sample location and returned to the sampling location. Excess sample material will be archived.

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8.0 PROJECT SCHEDULE

A schedule is contained in Appendix H.

APPENDIX A
K₁ LABORATORY PROCEDURE

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PROCEDURE FOR ANALYZING SOIL SAMPLES FOR URANIUM
K_i DETERMINATION

K_i SAMPLE PREPARATION

For collected samples, the leach water shall be pH adjusted by using 3500 ml of deionized (DI) water to pH between 4.5 and 5.0 using a mixture of sulfuric acid and nitric acid. This water will be referred to as pH adjusted water. 400 grams (dry weight) of soil will be placed in a 4.0 liter reactor along with 3500 ml of pH adjusted water.

SAMPLE MIXING

The samples will be placed in a rotating tumbler and mixed continuously until completion of the testing. The tumbler shall be operated at 29 +/- 2 rpm.

COLLECTION OF SAMPLES DURING TESTING

Samples of the leachate will be collected after stopping the tumbler for a sufficient time period (minimum of 10 minutes) to allow the solids to settle. A volume of the leachate will be decanted from the reactor and filtered through a .45 micron filter paper. The volume of decant removed will be based upon the requirements for analytical testing (approx. 20 ml). After the removal of the decant, 20 ml of pH adjusted water will be added back to the reactor. Any solids transferred during the separation step will be returned to the reactor.

Intermediate samples will be collected at approximately 72, 144, 168, 240, 288, 360, and 384 hours following initiation of the reaction and analyzed at the FEMP laboratory for total uranium. The reaction may be stopped earlier if the data indicate that equilibrium conditions between the soil and liquid have been achieved. Equilibrium will be determined by maintaining a plot of concentration vs. time for each reaction.

After the results indicate an equilibrium condition, a final sample will be collected and split for analysis by both the FEMP laboratory and an off-site laboratory. The final sample will be analyzed for isotopic uranium. If a sample does not reach equilibrium after 384 hours, a decision of whether to terminate the testing will be made.

After completion of the first batch test, a second test will be run for each sample using fresh leach water and the soil produced from the first reaction. Identical batch testing procedures will be followed for the second test. At completion of the second batch test, a soil sample will be collected from the tumbler and split for analysis by both the FEMP laboratory and an off-site laboratory.

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APPENDIX B
DATA QUALITY OBJECTIVES

2830

DQO SL-015

Contact Mark Cherry

Group CRU5

DQO Approval Date 6/20/94



DQO Coordinator

6/20/94

Date

DATA QUALITY OBJECTIVE
LOGIC FLOW PROCESS WORKSHEET

1. State the Problem or the Situation to be Resolved

In order to assess predicted future impacts of surface soils contaminated by air deposition of uranium on groundwater, the need exists to quantify the solubility of uranium in these soils as reflected in the leaching coefficient (K_f). Additionally, analytical data will be collected to examine the association of metals and other radiological contaminants in areas affected by air deposition of uranium.

This information will be input into the groundwater fate and transport model used during the evaluation of remedial alternatives and the development of preliminary remediation goals.

2. Identify the Decisions to be Made that Affect the Situation

If accurate laboratory-derived uranium K_f values and matrix characteristics are not obtained, then the fate and transport modeling will not accurately represent contaminant transport.

3. Identify Inputs that Affect the Decision

Soil samples will be collected from 0 to 2 inches and 24 to 30 inches at 15 sample locations. Each soil sample will be analyzed for total metals, dry bulk density, total organic carbon, radiological parameters, TCLP metals, and TCLP radiological parameters. Liquid samples collected during the K_f procedure, a desorption batch test for uranium, will be analyzed at the FERMCO lab for total uranium.

Additional volumes of soil will be collected at 6 inch intervals from the surface to a depth of 30 inches at each location. Sufficient volumes of soil will be collected to analyze for all project parameters. A portion of each soil sample will be analyzed for total and isotopic uranium at the FERMCO laboratory; the remaining soil will be archived.

The analytical data will be used to characterize the soil matrix effects on organic compounds, radiological constituents and metals mobility, and the K_f of uranium in surface soils.

4. Define the Boundaries of the Situation

Fifteen sampling locations (see Figure 1) within the FEMP property boundaries have been chosen based on prevailing wind directions, source locations, soil type. Sampling locations are biased towards areas of known or suspected surface soil contamination; areas affected anthropogenically have been avoided.

The data from this investigation and subsequent desorption tests is necessary for inclusion into the Operable Unit 5 FS submitted to the U.S. EPA in November 1994. Sampling, analysis, and data processing must be completed before this date.

5. Develop a Logic Statement

All data derived from this investigation will be used to support groundwater fate and transport modeling to predict future impacts to groundwater. This information will assist Operable Unit 5 in evaluating remedial alternatives and strategies for surface soils impacted by air deposition of uranium.

If analytical results indicate a high leachability for uranium in surface soils located in the target areas, then preliminary remediation goals and soil volume estimates for remediation will have to be re-evaluated.

6. Establish Constraints on the Uncertainty of the Decision

A false positive error would be a soil sample result that indicate a higher than actual solubility. The consequences of this type of error would be overestimating the impacts of surface contamination on the groundwater and possibly driving more aggressive remediation of these areas.

A false negative error, of greater environmental and health and safety concern, would result in underestimating the mobility of contaminants from the soils to the groundwater and, ultimately, provide inadequate characterization of the contaminant fate and transport.

No regulatory action levels are applicable to this investigation; therefore, standard computer programs cannot be used to quantify acceptable percent errors. Laboratory and field quality controls measures shall be instituted to minimize errors. A 90 percent data recovery is deemed acceptable for this project. If sufficient valid data points are not obtained to meet project objectives, then samples collected for archive are available for analysis providing individual parameter hold times have not expired.

Errors in the sampling will be controlled through thorough review of the sampling plan requirements with sampling technicians, providing on-site technical guidance by Operable Unit 5 technical staff during the sampling operation, and the use of field quality control samples.

Errors in the laboratory analysis will be controlled through the use of QA/QC samples. QA/QC samples will be analyzed for metals and radiological parameters.

7. Optimize a Design for Obtaining Quality Data

Optimization is achieved by focusing on areas affected by air deposition based on the evaluation of available soils data and historical uranium releases to the air pathway.

Data quality will be realized through adherence to SCQ sampling and analytical protocols. Training and technical oversight for field staff will be documented.

With the exception of total uranium and isotopic uranium analyzed by the on-site laboratory which will be validated to an ASL B, radiological parameters will be validated to an ASL D. Radiological laboratory QA/QC requirements for ASL D will include method blanks and laboratory control samples. Laboratory samples for ASL B will include method blanks, matrix spikes, and laboratory control samples. The QA/QC sample performance criteria are defined in the SCQ Radiochemical Analysis Performance Specifications (Appendix G).

Laboratory QA/QC requirements for the TCLP and total metals analysis, validated to an ASL D, include method blanks, matrix spikes and laboratory control samples.

In order to meet the ASL D field QC requirements the following field QC samples will be collected:

- Field blanks - One field blank will be collected at each sampling location for a total of 15 samples.
- Rinsate samples - Six rinsate samples will be prepared from field equipment and sample preparation equipment.
- Duplicate samples - A total of 2 duplicate samples will be collected. For ASL D, duplicate samples are collected at a ratio of one per 20 samples or fraction thereof.

The field QC samples outlined above will be analyzed for HSL metals and total uranium. Due to the large volumes of sample required to meet the low radiological detection limits specified for this program, it is impractical to generate the field QC sample volumes required for a full radiological analysis (e.g., rinsate volumes would approach 20 gallons). Because sampling locations have been biased to areas affected by air deposition of uranium, total uranium analysis will be used as the field QC indicator for the radiological components of this sampling program.

DATA QUALITY OBJECTIVE NUMBER
REQUEST FORM

To be completed by the Sampling Project Team Leader:

1. Date Requested:

April 27, 1994

2. Project Name:

W.B.S. 50.03.27 K, Soil Sampling and Analysis Program

3. Area to be Sampled:

Surface soils at the FEMP that either have, or potentially have been subject to deposition of uranium through airborne emissions.

4. Media to be Sampled (If more than one, please Specify):

Surface Soil

5. Purpose for sampling:

The objective of this work scope is to determine contaminant solubility of surface soil in areas suspect of having above background levels of uranium as a result of airborne deposition. This information is necessary in assessing predicted future impacts on groundwater during the evaluation of remedial alternatives and the development of preliminary remediation goals.

6. Existing DQOs that completely or partially fulfill the sampling requirements:

None.

7. Sampling Project Team Leader's Name and Phone Number:

Mark Cherry 738-6816

8. Sampling Project Team Members:

To be assigned by Site Characterization

FOR ENV USE ONLY

DQO No. Assigned:

Name of Assignor:

Comments:

DQO SUMMARY FORM

Revision: 0
Effective Date: 6/20/94

1.A. Task/Description:

CRU # 5

Soil Sampling to determine the uranium leaching coefficient and the effects of the soils matrix on the solubility of metals and organic compounds.

1.B. Project Phase: (Put an X in the appropriate selection.)

RI FS RD RA R_A OTHER Specify:

1.C. DQO No.: SL-015 DQO Reference No.: _____

2. Media Characterization: (Put an X in the appropriate selection.)

Air Biological Groundwater Sediment Soil

Waste Wastewater Surface water Other (specify) _____

3. Data Use with Analytical Support Level (A-E): (Put an X in the appropriate Analytical Support Level selection(s) beside each applicable Data Use.)

Site Characterization
A B C D E

Risk Assessment
A B C D E

Evaluation of Alternatives
A B C D E

Engineering Design
A B C D E

Monitoring during remediation activities
A B C D E

Other (Explain) _____
A B C D E

4.A. Drivers: CERCLA

4.B. Objective: Determine the coefficient of distribution for uranium and the effect of the soils matrix on the mobility of metals combinations. This data is necessary for the baseline risk assessment for the Operable Unit 5 Feasibility Study.

5. Site Information (Description): Surface soils at various locations on FEMP property within the Operable Unit 5 boundaries.

DQO SUMMARY FORM

Revision: 0
Effective Date: 6/20/94

DQO Number: SL-015

6.A. Data Types with appropriate Analytical Support Level Equipment Selection and SCQ Reference: (Place an "X" to the right of the appropriate box or boxes selecting the type of analysis or analyses required. Then select the type of equipment to perform the analysis if appropriate. Please include a reference to the SCQ Section.)

- 1. pH [] Temperature [] Specific Conductance [] Dissolved Oxygen []
2. Uranium [X] Full Radiologic [X] Metals [X] Cyanide [] Silica []
3. BTX [] TPH [] Oil/Grease []
4. Cations [] Anions [] TOC [X] TCLP [X] CEC [] COD []
5. VOA [] ABN [] Pesticides [] PCB []
6. Other (specify) Dry Bulk Density

6.B. Equipment Selection and SCQ Reference:

- Equipment Selection Refer to SCQ Section
ASL A SCQ Section:
ASL B Criterion 27:Pulsed Laser Phosphorimetry SCQ Section: Appendix G
ASL C SCQ Section:
ASL D Analytical Equipment SCQ Section: Append.G
ASL E SCQ Section:

7.A. Sampling Methods: (Put an X in the appropriate selection.)

- Biased [] Composite [] Environmental [X] Grab [X] Grid []
Intrusive [X] Non-Intrusive [] Phased [] Source []

Other (specify): 000042

DQO SUMMARY FORM

Revision: 0
Effective Date: 6/20/94

DQO Number: SL-15

7.B. Sample Work Plan Reference: (List the samples required. Reference the work plan or sampling plan guiding the sampling activity, as appropriate.)

Background samples: Project Specific Plan for KI Soil Sampling and Analysis

7.C. Sample Collection Reference: (Please provide a specific reference to the SCQ Section and subsection guiding sampling collection procedures.)

Sample Collection Reference: Appendix K, Sections 4 and 5

8. Quality Control Samples: (Place an "X" in the appropriate selection box.)

8.A. Field Quality Control Samples:

- | | | | |
|-------------------------|-------------------------------------|--------------------------------|-------------------------------------|
| Trip Blanks | <input type="checkbox"/> | Container Blanks | <input type="checkbox"/> |
| Field Blanks | <input checked="" type="checkbox"/> | Duplicate Samples | <input checked="" type="checkbox"/> |
| Equipment Rinse Samples | <input checked="" type="checkbox"/> | Split Samples | <input type="checkbox"/> |
| Preservative Blanks | <input type="checkbox"/> | Performance Evaluation Samples | <input type="checkbox"/> |

Other (specify) _____

8.B. Laboratory Quality Control Samples:

- | | | | |
|--------------|-------------------------------------|----------------------------|-------------------------------------|
| Method Blank | <input checked="" type="checkbox"/> | Matrix Duplicate/Replicate | <input checked="" type="checkbox"/> |
| Matrix Spike | <input checked="" type="checkbox"/> | Surrogate Spikes | <input type="checkbox"/> |

Other (specify) Laboratory Control

9. Other: Please provide any other germane information that may impact the data quality or gathering of this particular objective, task or data use.

APPENDIX C
PROJECT EQUIPMENT LIST

0333

PROJECT EQUIPMENT LIST

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DOCUMENTS

Required
Penetration Permit
Health and Safety Plan
Radiological Worker Permit
Training Certification Card
Radiological Survey
Equipment Inspection (for Backhoe)
Project-Specific Plan

Blank Forms

Tailgate Safety Meeting
FAL
Lithologic Log
Sample Collection Log
Site-Wide Analysis Request/
Chain of Custody
Material Evaluation Form

Storage

Metal Clipboard Box
File Box

SAMPLING SUPPLIES

Stainless Steel Scoops and Trowels
Stainless Steel Dividers
1-Gallon Glass Containers
Sample Labels
Permanent Indelible Markers
Sampling Table
Coolers/Artificial Ice
1-liter Glass Containers
120-mL Plastic Containers

METERS/DETECTORS

Beta Gamma Detector(Frisker)
Photoionization Detector (Microtip)

TAPES & PLASTICS

Silver Duct Tape
Yellow Radiological Tape
Clear Tape
Herculite
Roll of Clear Plastic
Custody Tape

MISCELLANEOUS TOOLS

Scissors
Screwdriver
Hammer
Box Knife
Tape Measure/Yardstick
Carpenters Level

EXCLUSION ZONE SUPPLIES

Caution Tape
Wooden Stakes
Danger/Caution Signs/Flags

DECONTAMINATION SUPPLIES

Stainless Steel 5-Gallon Pails
Container for Decontaminating Trowels
Bowls, and Dividers
Alconox
Elbow-length Nitrile Gloves
Brushes
Stainless Steel Water Sprayer
Deionized Water
Clear Plastic Sheeting

PERSONAL PROTECTION EQUIPMENT

Coveralls
Steel-Toed Boots
Safety Glasses
Dosimeter
Latex Gloves
Cotton Glove Liners
Leather Work Gloves
Ice Vests/Ice

IDW SUPPLIES

Plastic Trash Bags
55-Gallon Steel Drums
Stencils
White & Black Spray Paint

PERSONAL SUPPLIES

Water Dispenser
Paper Cups
Drinking Water
Ice

EMERGENCY SAFETY SUPPLIES & EQUIPMENT

Radio
Emergency Eyewash Station
5-10 Extra Gallons of
Deionized Water for
Emergency
Decontamination
First Aid Kit

GEOLOGICAL SUPPLIES

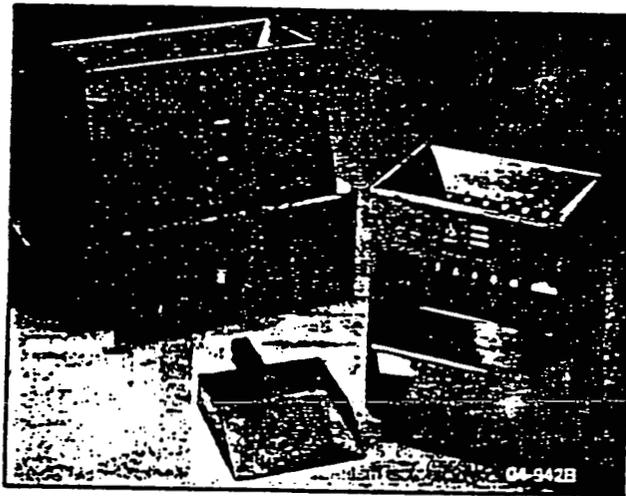
Munsell Color Chart
Pocket Penetrometer

HOMOGENIZATION EQUIPMENT

No. 10 Stainless Steel Sieves
Stainless Steel Riffles
Stainless Steel Pans
Stainless Steel Spoons
Glass or Plastic Sample
Containers
Latex Gloves
Sample Labels
Custody Tape
Permanent Indelible Markers
Pens
Stainless Steel Grinder
Stainless Steel Knife
Oven
Fume Hoods
Clear Plastic Sheeting

000045

Riffle Samplers



Enclosed Drawer Riffle Sampler

APPENDIX D
SAMPLE NUMBERS

TABLE D-1

**SAMPLE NUMBERS FOR KL-SS-01
K, SOIL SAMPLING AND ANALYSIS**

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200001	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200002	24" - 30"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200003	0 - 6"	On-site	Total and Isotopic Uranium
200004	0 - 6"	On-site	Dry Bulk Density
200005	0 - 6"	-	Archive
200006	6" - 12"	On-site	Total and Isotopic Uranium
200007	6" - 12"	-	Archive
200008	12" - 18"	On-site	Total and Isotopic Uranium
200009	12" - 18"	-	Archive
200010	18" - 24"	On-site	Total and Isotopic Uranium
200011	18" - 24"	-	Archive
200012	0 - 2"	-	Archive
200013	24" - 30"	On-site	Dry Bulk Density
200014	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Tl, V, Zn

TABLE D-2

**SAMPLE NUMBERS FOR KL-SS-02
K, SOIL SAMPLING AND ANALYSIS**

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200015	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200016	24" - 30"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200017	0 - 6"	On-site	Total and Isotopic Uranium
200018	0 - 6"	On-site	Dry Bulk Density
200019	0 - 6"	-	Archive
200020	6" - 12"	On-site	Total and Isotopic Uranium
200021	6" - 12"	-	Archive
200022	12" - 18"	On-site	Total and Isotopic Uranium
200023	12" - 18"	-	Archive
200024	18" - 24"	On-site	Total and Isotopic Uranium
200025	18" - 24"	-	Archive
200026	0 - 2"	-	Archive
200027	24" - 30"	On-site	Dry Bulk Density
200028	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Tl, V, Zn

000049

TABLE D-3

**SAMPLE NUMBERS FOR KL-SS-03
K, SOIL SAMPLING AND ANALYSIS**

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200029	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200030	24" - 30"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200031	0 - 6"	On-site	Total and Isotopic Uranium
200032	0 - 6"	On-site	Dry Bulk Density
200033	0 - 6"	-	Archive
200034	6" - 12"	On-site	Total and Isotopic Uranium
200035	6" - 12"	-	Archive
200036	12" - 18"	On-site	Total and Isotopic Uranium
200037	12" - 18"	-	Archive
200038	18" - 24"	On-site	Total and Isotopic Uranium
200039	18" - 24"	-	Archive
200040	0 - 2"	-	Archive
200041	24" - 30"	On-site	Dry Bulk Density
200042	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Tl, V, Zn

TABLE D-4

**SAMPLE NUMBERS FOR KL-SS-04
K, SOIL SAMPLING AND ANALYSIS**

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200043	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200044	24" - 30"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200045	0 - 6"	On-site	Total and Isotopic Uranium
200046	0 - 6"	On-site	Dry Bulk Density
200047	0 - 6"	-	Archive
200048	6" - 12"	On-site	Total and Isotopic Uranium
200049	6" - 12"	-	Archive
200050	12" - 18"	On-site	Total and Isotopic Uranium
200051	12" - 18"	-	Archive
200052	18" - 24"	On-site	Total and Isotopic Uranium
200053	18" - 24"	-	Archive
200054	0 - 2"	-	Archive
200055	24" - 30"	On-site	Dry Bulk Density
200056	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Ti, V, Zn

TABLE D-5
SAMPLE NUMBERS FOR KL-SS-05
K, SOIL SAMPLING AND ANALYSIS

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200057	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200058	24" - 30"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200059	0 - 6"	On-site	Total and Isotopic Uranium
200060	0 - 6"	On-site	Dry Bulk Density
200061	0 - 6"	-	Archive
200062	6" - 12"	On-site	Total and Isotopic Uranium
200063	6" - 12"	-	Archive
200064	12" - 18"	On-site	Total and Isotopic Uranium
200065	12" - 18"	-	Archive
200066	18" - 24"	On-site	Total and Isotopic Uranium
200067	18" - 24"	-	Archive
200068	0 - 2"	-	Archive
200069	24" - 30"	On-site	Dry Bulk Density
200070	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Tl, V, Zn

TABLE D-6

**SAMPLE NUMBERS FOR KL-SS-06
K, SOIL SAMPLING AND ANALYSIS**

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200071	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200072	24" - 30"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200073	0 - 6"	On-site	Total and Isotopic Uranium
200074	0 - 6"	On-site	Dry Bulk Density
200075	0 - 6"	-	Archive
200076	6" - 12"	On-site	Total and Isotopic Uranium
200077	6" - 12"	-	Archive
200078	12" - 18"	On-site	Total and Isotopic Uranium
200079	12" - 18"	-	Archive
200080	18" - 24"	On-site	Total and Isotopic Uranium
200081	18" - 24"	-	Archive
200082	0 - 2"	-	Archive
200083	24" - 30"	On-site	Dry Bulk Density
200084	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Tl, V, Zn

000053

TABLE D-7

SAMPLE NUMBERS FOR KL-SS-07
K, SOIL SAMPLING AND ANALYSIS

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200085	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200086	24" - 30"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200087	0 - 6"	On-site	Total and Isotopic Uranium
200088	0 - 6"	On-site	Dry Bulk Density
200089	0 - 6"	-	Archive
200090	6" - 12"	On-site	Total and Isotopic Uranium
200091	6" - 12"	-	Archive
200092	12" - 18"	On-site	Total and Isotopic Uranium
200093	12" - 18"	-	Archive
200094	18" - 24"	On-site	Total and Isotopic Uranium
200095	18" - 24"	-	Archive
200096	0 - 2"	-	Archive
200097	24" - 30"	On-site	Dry Bulk Density
200098	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Ti, V, Zn

TABLE D-8

**SAMPLE NUMBERS FOR KL-SS-08
K, SOIL SAMPLING AND ANALYSIS**

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200099	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals; TOC
		On-site	Total and Isotopic Uranium
200100	24" - 30"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200101	0 - 6"	On-site	Total and Isotopic Uranium
200102	0 - 6"	On-site	Dry Bulk Density
200103	0 - 6"	-	Archive
200104	6" - 12"	On-site	Total and Isotopic Uranium
200105	6" - 12"	-	Archive
200106	12" - 18"	On-site	Total and Isotopic Uranium
200107	12" - 18"	-	Archive
200108	18" - 24"	On-site	Total and Isotopic Uranium
200109	18" - 24"	-	Archive
200110	0 - 2"	-	Archive
200111	24" - 30"	On-site	Dry Bulk Density
200112	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Ti, V, Zn

000055

TABLE D-9

**SAMPLE NUMBERS FOR KL-SS-09
K₁ SOIL SAMPLING AND ANALYSIS**

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200113	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200114	24" - 30"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200115	0 - 6"	On-site	Total and Isotopic Uranium
200116	0 - 6"	On-site	Dry Bulk Density
200117	0 - 6"	-	Archive
200118	6" - 12"	On-site	Total and Isotopic Uranium
200119	6" - 12"	-	Archive
200120	12" - 18"	On-site	Total and Isotopic Uranium
200121	12" - 18"	-	Archive
200122	18" - 24"	On-site	Total and Isotopic Uranium
200123	18" - 24"	-	Archive
200124	0 - 2"	-	Archive
200125	24" - 30"	On-site	Dry Bulk Density
200126*	24" - 30"	Off-site	Total Uranium, HSL Metals
200127	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Tl, V, Zn

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TABLE D-10

**SAMPLE NUMBERS FOR KL-SS-10
K, SOIL SAMPLING AND ANALYSIS**

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200128	0 - 2"	Off-site On-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC Total and Isotopic Uranium
200129	24" - 30"	Off-site On-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC Total and Isotopic Uranium
200130	0 - 6"	On-site	Total and Isotopic Uranium
200131	0 - 6"	On-site	Dry Bulk Density
200132	0 - 6"	-	Archive
200133	6" - 12"	On-site	Total and Isotopic Uranium
200134	6" - 12"	-	Archive
200135	12" - 18"	On-site	Total and Isotopic Uranium
200136	12" - 18"	-	Archive
200137	18" - 24"	On-site	Total and Isotopic Uranium
200138	18" - 24"	-	Archive
200139	0 - 2"	-	Archive
200140	24" - 30"	On-site	Dry Bulk Density
200141	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Ti, V, Zn

000057

TABLE D-11

**SAMPLE NUMBERS FOR KL-SS-11
K, SOIL SAMPLING AND ANALYSIS**

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200142	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total-Rads, HSL-Metals, TOC
		On-site	Total and Isotopic Uranium
200143	24" - 30"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200144	0 - 2"	On-site	Total Uranium and HSL Metals
200145	0 - 6"	On-site	Total and Isotopic Uranium
200146	0 - 6"	On-site	Dry Bulk Density
200147	0 - 6"	-	Archive
200148	6" - 12"	On-site	Total and Isotopic Uranium
200149	6" - 12"	-	Archive
200150	12" - 18"	On-site	Total and Isotopic Uranium
200151	12" - 18"	-	Archive
200152	18" - 24"	On-site	Total and Isotopic Uranium
200153	18" - 24"	-	Archive
200154	0 - 2"	-	Archive
200155	24" - 30"	On-site	Dry Bulk Density
200156	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Ti, V, Zn

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TABLE D-12

**SAMPLE NUMBERS FOR KL-SS-12
K, SOIL SAMPLING AND ANALYSIS**

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200157	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200158	24" - 30"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200159	0 - 6"	On-site	Total and Isotopic Uranium
200160	0 - 6"	On-site	Dry Bulk Density
200161	0 - 6"	-	Archive
200162	6" - 12"	On-site	Total and Isotopic Uranium
200163	6" - 12"	-	Archive
200164	12" - 18"	On-site	Total and Isotopic Uranium
200165	12" - 18"	-	Archive
200166	18" - 24"	On-site	Total and Isotopic Uranium
200167	18" - 24"	-	Archive
200168	0 - 2"	-	Archive
200169	24" - 30"	On-site	Dry Bulk Density
200170	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Ti, V, Zn

TABLE D-13

**SAMPLE NUMBERS FOR KL-SS-13
K, SOIL SAMPLING AND ANALYSIS**

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200171	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200172	24" - 30"	Off-site	TCLP Rads, TCLP HSI Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200173	0 - 6"	On-site	Total and Isotopic Uranium
200174	0 - 6"	On-site	Dry Bulk Density
200175	0 - 6"	-	Archive
200176	6" - 12"	On-site	Total and Isotopic Uranium
200177	6" - 12"	-	Archive
200178	12" - 18"	On-site	Total and Isotopic Uranium
200179	12" - 18"	-	Archive
200180	18" - 24"	On-site	Total and Isotopic Uranium
200181	18" - 24"	-	Archive
200182	0" - 2"	-	Archive
200183	24" - 30"	On-site	Dry Bulk Density
200184	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Ti, V, Zn

TABLE D-14

**SAMPLE NUMBERS FOR KL-SS-14
K, SOIL SAMPLING AND ANALYSIS**

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200185	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200186	24" - 30"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200187	0 - 6"	On-site	Total and Isotopic Uranium
200188	0 - 6"	On-site	Dry Bulk Density
200189	0 - 6"	-	Archive
200190	6" - 12"	On-site	Total and Isotopic Uranium
200191	6" - 12"	-	Archive
200192	12" - 18"	On-site	Total and Isotopic Uranium
200193	12" - 18"	-	Archive
200194	18" - 24"	On-site	Total and Isotopic Uranium
200195	18" - 24"	-	Archive
200196	0 - 2"	-	Archive
200197	24" - 30"	On-site	Dry Bulk Density
200198	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Ti, V, Zn

TABLE D-15

**SAMPLE NUMBERS FOR KL-SS-15
K, SOIL SAMPLING AND ANALYSIS**

SAMPLE NUMBER	SAMPLE INTERVAL	LABORATORY	PARAMETER LIST
200199	0 - 2"	Off-site	TCLP Rads, TCLP HSL Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200200	24" - 30"	Off-site	TCLP Rads, TCLP Metals, Total Rads, HSL Metals, TOC
		On-site	Total and Isotopic Uranium
200201	0 - 6"	On-site	Total and Isotopic Uranium
200202	0 - 6"	On-site	Dry Bulk Density
200203	0 - 6"	-	Archive
200204	6" - 12"	On-site	Total and Isotopic Uranium
200205	6" - 12"	-	Archive
200206	12" - 18"	On-site	Total and Isotopic Uranium
200207	12" - 18"	-	Archive
200208	18" - 24"	On-site	Total and Isotopic Uranium
200209	18" - 24"	-	Archive
200210	0 - 2"	-	Archive
200211	24" - 30"	On-site	Dry Bulk Density
200212	24" - 30"	-	Archive

Total Rads include: Cs-137, Np-237, Pu-238, Pu-239/240, Pu-241, Ra-226, Ra-228, Sr-90, Tc-99, Th-227, Th-228, Th-230, Th-232, U-234, U-235/236, U-238, Total Uranium

HSL Metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn, Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si, Ag, Ti, V, Zn

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TABLE D-16

FIELD QC SAMPLE NUMBERS
K, SOIL SAMPLING & ANALYSIS

QC TYPE	SAMPLE NUMBER	ANALYTICAL PARAMETERS
Field Blanks	200214 200215 200216 200217 200218 200219 200220 200221 200222 200223 200224 200225 200226 200227 200228	HSL Metals Total Uranium
Rinsates	200229 200230 200231 200232 200233 200234	HSL Metals Total Uranium

HSL metals include: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Cn,
Hg, Fe, Pb, Mg, Mn, Mo, Ni, K, Na, Se, Si,
Ag, Ti, V, Zn

APPENDIX E
EXAMPLE FIELD FORMS

2830 -

CONTROL NUMBER:

FEMP LITHOLOGIC LOG

Page _____ of _____

PROJECT NAME: _____ PROJECT NUMBER: _____

BORING NUMBER: _____ COORDINATES: _____ RELATED PAL NUMBERS: _____

SURFACE ELEVATION: _____ GROUNDWATER LEVEL: _____ DATE: _____ TIME: _____ DATE STARTED: _____

GEOLOGIST: _____ GROUNDWATER LEVEL: _____ DATE: _____ TIME: _____ DATE COMPLETED: _____

WATER USED DURING DRILLING: _____ DRILLING CONTRACTOR: _____ DRILLING EQUIPMENT: _____ DRILLER/HELPER: _____

DEPTH (FEET)	SAMPLE TIME, DATE, AND NUMBER	BLOWS (per 6 inch)	RECOVERY (inches)	DESCRIPTION (Colors identified per Munsell Color Chart)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0							
1							
2							
3							
4							
5							
6							
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47							
48							
49							
50							

INSTRUMENT	BACKGROUND	DATE	TIME	NOTES: _____ _____ _____ _____
PID				
ALPHA			000066	
BETA/GAMMA				

* Samples collected per ASTM Standard Penetration test.

FEMP
SAMPLE COLLECTION LOG - SAMPLE CODES

PRESERVATIVES CODE		QA/QC SAMPLE DESIGNATION CODE		SAMPLE TYPE CODE	
P00	None Required	Q01	Preservation Blank	M100	Ground Water
P01	Cool, 4° C	Q02	Container Blank	M101	Surface Water
P02	Freeze, <0° C	Q03	Temperature Blank	M102	Milk
P03	Filter on site	Q04	Trip Blank	M103	Soil
P04	Filter on site/HNO ₃ to pH < 2	Q05	Field Blank	M104	Sediment
P05	Filter on site/Cool, 4° C	Q06	Rinse	M105	Vegetation
P06	Filter on site/Cool, 4° C/H ₂ SO ₄ to pH < 2	Q07	Duplicate Sample	M107	Algae
P07	H ₂ SO ₄ to pH < 2	Q08	Split Sample	M108	Meat
P08	H ₂ SO ₄ to pH < 2/Cool, 4° C	Q09	Deionized Water Blank	M109	Fish (total)
P09	HCl to pH < 2	Q10	Matrix Spike	M110	Fish (edible fillets)
P10	HCl to 1%	Q11	Matrix Spike/Matrix Spike Duplicate	M111	Sludge
P11	HNO ₃ to pH < 2			M112	Air Filter
P12	HNO ₃ to 1%			M118	Miscellaneous (specific description addressed in remark field)
P13	HNO ₃ to pH < 2/Cool, 4° C			M300	Tank Contents (water)
P14	NaOH to pH > 12/Cool, 4° C			M301	Tank Contents (organic)
P15	Na ₂ S ₂ O ₅ (10% soln) to 1%			M302	Tank Contents (unknown)
P16	Na ₂ S ₂ O ₅ 100 mg/L			M305	Concrete
P17	Cool, 4° C/2mL ZnOAc + NaOH to pH > 9			M310	Liquid (unknown)
				M314	Oils
				M317	Rocks/Bricks
				M322	Solid (unknown)
				M333	Deionized Water
				M334	Drill Cuttings

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APPENDIX F

PROJECT-SPECIFIC HEALTH AND SAFETY PLAN

**FERNALD ENVIRONMENTAL
 RESTORATION MANAGEMENT CORPORATION**
PROJECT SPECIFIC HEALTH AND SAFETY PLAN
FOR
K₁ SOIL SAMPLING AND ANALYSIS PROJECT
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

RI/FS WBS NUMBER 50.03.27

REVISION 2 (revisions shaded)

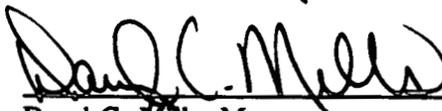
EMERGENCY PHONE: 738-6511

RADIO: CONTROL

July 11, 1994

APPROVAL:


 _____ 7/12/94
 David Brettschneider, Project Director Date
 CERCLA/RCRA Unit #5


 _____ 7/12/94
 Daryl C. Mills, Manager Date
 Occupational Safety and Health Compliance

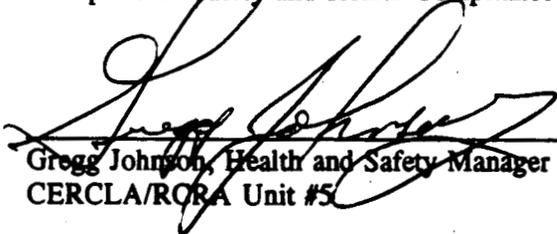

 _____ 7/12/94
 Gregg Johnson, Health and Safety Manager Date
 CERCLA/RORA Unit #5

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LIST OF ATTACHMENTS

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A	Project Specific Health and Safety Requirements Matrix
B	Personnel Environmental Monitoring and Action Levels
C	FEMP Rally Points
D	Location of FEMP Medical Facility
E	Work Area Material Safety Data Sheets (MSDSs)
F	Work Area Map
G	OSHA and DOE Employee Rights Poster
H	Acknowledgement Form
I	Excavation and Trenching Permit
J	Work Permit
K	Open Flame & Welding, Hazardous Work Permit
L	Trench Inspection Log
M	Subcontractor Health and Safety Requirements

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1.0 INTRODUCTION

This Project Specific Health and Safety Plan (PSHSP) is for the field sampling of soil and subsoil materials in support of CERCLA/RCRA Unit 5 (CRU5). Compliance with this plan is required by all personnel who perform field sampling and field support activities in association with this project.

All field personnel who enter the Exclusion Zones for this project must be trained to the requirements of this PSHSP. Also, all personnel must be trained to the requirements of the Health and Safety Requirements Matrix, which is shown as Attachment A of this PSHSP. All personnel must signify that they have received training to this PSHSP, understand the PSHSP requirements, and will abide by the provisions of the plan. This affirmation verification shall be documented on an Acknowledgement Log (Attachment H) which is to be signed by all project personnel. Acknowledgement Logs shall be controlled by FERMCO health and safety personnel.

1.1 PROJECT-SPECIFIC DESCRIPTION AND HISTORY

The purpose of this project is to collect soil samples at 15 locations for K_1 (Leachate Coefficient), in support of the CRU5 RI/FS. Field sampling locations in support of this project are shown as Attachment F of this PSHSP.

1.2 WORK AREA DESCRIPTION

All sampling locations are shown on the map, which is Attachment F of this PSHSP. All sampling points are located within the boundary of the FEMP.

The following description of the soil and subsoil sampling locations is as follows:

- K_1 -SS-01** This sampling point is located in the Northwest part of the FEMP boundary. It is outside the Process Area and is located approximately 400 feet North of Waste Pit #5.
- K_1 -SS-02** This sampling point is located in the Northwest part of the FEMP property. It is outside the Process Area, but is within the Waste Pits area. It is located approximately 100 feet West of Waste Pit #5.
- K_1 -SS-03** This sampling point is located in the West central area of the FEMP property. It is outside the Process Area, and is located approximately 1500 feet due South of the Bionitrification Surge Lagoon.
- K_1 -SS-04** This sampling point is located in the Southwest area of the FEMP property. It is outside the Process Area, and is located approximately 1000 feet South of the Pilot Plant.
- K_1 -SS-05** This sampling point is located in the Southwest area of the FEMP property. It is outside the Process Area, and is located approximately 600 feet South of sampling point K_1 -SS-04.

- K_t-SS-06** This sampling point is located in the South central area of the FEMP property. It is outside the Process Area, and is located approximately 1400 feet South of the Storm Water Retention Basin.
- K_t-SS-07** This sampling point is located in the Southeast corner of the FEMP property. It is outside the Process Area, and is located approximately 300 feet North of the electrical substation on Willey Road. Underground pipelines exist in the vicinity of this sampling point. The pipeline location will be identified during Penetration Permit acquisition.
- K_t-SS-08** This sampling point is located in the Southeast area of the FEMP property. It lies outside the Process Area, and is approximately 1500 feet South of the FEMP Skeet Range building. Further information regarding the potential for inorganic contamination at the surface is discussed in Section 3.1 of this PSHSP. Underground pipelines exist in the vicinity of this sampling point. The pipeline location will be identified during Penetration Permit acquisition.
- K_t-SS-09** This sampling point is located in the Southeast area of the FEMP property. It lies outside the Process Area, and is approximately 300 feet East of the FEMP Skeet Range building. Further information regarding the potential for inorganic contamination at the surface is discussed in Section 3.1 of this PSHSP. Underground pipelines exist in the vicinity of this sampling point. The pipeline location will be identified during Penetration Permit acquisition.
- K_t-SS-10** This sampling point is located in the Eastern area of the FEMP property. It lies outside the Process Area, and is approximately 400 feet West of the Sewage Treatment Plant. An FEMP natural gas pipeline is in the vicinity of the sampling point. The pipeline location will be identified during Penetration Permit acquisition.
- K_t-SS-11** This sampling point is located in the Eastern area of the FEMP property. It lies outside the Process Area, and is approximately 800 feet North of the Sewage Treatment Plant.
- K_t-SS-12** This sampling point is located in the Northeast corner of the FEMP property. It lies outside the Process Area, and is approximately 600 feet South of the North Access Road.
- K_t-SS-13** This sampling point is located in the Northeast area of the FEMP property. It lies outside the Process Area, and is approximately 800 feet North of the Scrap Metal Pile.
- K_t-SS-14** This sampling point is located in the North central area of the FEMP property. It lies within the Waste Pit Area, and is located approximately 600 feet Southeast of Waste Pit #6.

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RI/EG PSHSP

July 11, 1994

Revision: 2

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K₁-SS-15 This sampling point is located in the North central area of the FEMP property. It lies outside the Process Area, and is approximately 300 feet Northeast of the Sanitary Landfill.

As field sampling is completed, sample containers will be removed to the FEMP Analytical Laboratory for homogenization.

1.3 WORK DESCRIPTION

As is demonstrated by the project map, the proposed sampling is to be done at 15 separate locations. At each location the vegetation cover will be removed, and samples obtained from two discrete horizons (0 - 2 inches, and 24 - 30 inches) at each location. Sampling will be performed by trenching with a construction backhoe and sampling soil material by access from the trench wall. All sampling locations are within the FEMP boundary.

Additional soil samples will be collected at 6-inch intervals (0 - 6 in., 6 - 12 in., 12 - 18 in., 18 - 24 in., and 24 - 30 in.). These samples will be archived.

During soil sampling, sampled media will be containerized, field screened, and sent to the FEMP Analytical Laboratory for drying, homogenization, re-containerization, and shipment off-site for laboratory analysis. All samples will be field screened for the presence of radiological constituents.

Equipment and personnel decontamination or replacement shall be performed between sampled locations and horizons.

Following sampling, all trenches and holes will be backfilled with material removed from the trench and/or hole to the natural landscape surface. Supplemental clean fill will be added as necessary to fill any remaining depressions.

Sample preparation in the FEMP Analytical Laboratory will consist of drying the soil, mixing the soil samples from the separate sample containers, material size separation, and containerization of the sample media in preparation for shipment. Drying the soil samples will be accomplished in a GRIEVE model PL-326 laboratory oven at approximately 140°F.

2.0 ORGANIZATION STRUCTURE AND KEY PERSONNEL RESPONSIBILITIES

The following table shows key personnel, including primary and alternates, for performance of this project.

TITLE	PRIMARY	ALTERNATE
Manager, Occupational Safety and Health Compliance	Daryl Mills	Ken Miller
Manager, Construction Health & Safety Compliance	Ken Miller	Daryl Mills
Project Director, CRU5	Dave Brettschneider	Mark Jewett
Manager, CERCLA/RCRA Unit 5 Health and Safety	Gregg Johnson	Kevin Murrin
CRU5 Health and Safety Officer/Assistant	Jeff Middaugh	Greg Lastoria
Environmental Division, Site Characterization Department Manager	Doug Harmel	Linda Rogers
Field Program Development Manager	Karen Voisard	Dan Stropes

3.0 SITE CONTROL

Prior to mobilization and actual performance of project field activities, a walkdown of each sampling location will be performed. Staff who participate in this walkdown include representatives from Industrial Hygiene, Radiation Control, the Field Operations Manager, and the CRU5 Health and Safety Officer/Assistant or designee. During the location walkdown, any specific hazards not previously identified will be noted. During the project training, these hazards, if any, will be identified and explained to the field project staff.

In addition, as part of the normal pre-project preparation activities, FEMP Standard Penetration Permits (PP) will be obtained for each sampling location. RWPs will be issued where required according to Radiation Control Technician surveys.

The PP will identify any subsurface features, such as buried utility, sewer, electrical or other types of installed conduits which could negatively impact the project or create a safety hazard during performance of the field work.

The RWP will identify any levels of radiological constituents at the ground surface which may constitute a radiological exposure hazard to project field staff.

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3.1 WORK AREA REQUIREMENTS

At the beginning of each work day and prior to field staff departing into the field, the FEMP Communications Center (non-emergency number, 6295) will be notified of the area at the FEMP where the work is to be performed, and the number of personnel at that location.

3.1.1 Radiological Areas

Entrances to and perimeters of radiological areas will be defined by yellow and magenta rope or, where practical, by physical structures such as fences or buildings. All radiological areas will be identified by signs having the standard radiation symbol, the trifoil, on a yellow background.

The following lists the types of radiological areas to be encountered during the performance of activities covered by this PSHSP:

Controlled Area - A controlled area is any area, room, or enclosure to which access is controlled to protect individuals from exposure to radiation or radioactive materials, or where radioactive materials may be present. Surface contamination, radiation, and airborne contaminants are less than applicable limits for further posting.

Soil Contamination Area - Soil Contamination Areas are areas where soils have been exposed to radioactive contamination.

Radioactive Material Area - A Radioactive Material Area is an area where radioactive material is used, handled, or stored.

Contamination Area - A Contamination Area is an area where removable radiological contamination is greater than DOE surface contamination guidelines for the isotope of concern.

3.1.2 Exclusion Zones

An Exclusion Zone will be established around each sampling location. The Exclusion Zone shall have one ingress and egress point. Access to the Exclusion Zone will be limited to sampling technicians, project field management staff, IH Technicians, and RCTs. Exclusion Zone barricades will consist of yellow caution tape. All other field activities not directly related to sampling (decontamination, sample homogenization, containerization and temporary storage) will be performed outside the Exclusion Zone boundary.

The Exclusion Zone shall have a sign posted to specify the hazard(s) within if deemed necessary by the responsible Radiation Control Technician.

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3.1.3 Inorganic Contamination Areas

No project sampling location is within an area of known inorganic contamination, with the exception of Locations K_L-SS-07, K_L-SS-08 and K_L-SS-09. These locations, respectively are in close proximity to the FEMP Skeet Shooting Range. All other soil sampling locations are in areas where there is no history of any inorganic contaminants being either disposed or handled.

Locations K_L-SS-07, K_L-SS-08 and K_L-SS-09 are in close proximity to where lead wastes are known to potentially occur. The lead source is from the periodic discharge of firearms, and subsequent deposition of lead in the form of spent lead shot. However, the solubility of lead in this form is such that it is essentially insoluble under standard conditions of ambient air temperature, and pressure expected to be encountered during sampling.

It is, however, possible that disintegrated lead shot or particles could be entrained into the atmosphere and sampler's breathing zones during field sampling activities. If the IH Technician notes that dust is generated during sampling, a fine mist of deionized water, applied by a hand-held portable aerosol sprayer, will be applied to control the dust.

3.1.4 Organic Contamination Areas

Although all sampling locations are in areas where no known organic contamination levels which exceed any Action Level exist, field staff will perform routine field screening of sampled media for the presence of organic constituents if any unusual odors are noted during sampling, or if any unusual soil stains, or patches of dead or no vegetation are observed. Field screening will be accomplished with a Photoionization Detector (PID), which provides real time information. If the PID displays an organic vapor reading of 5 parts per million or greater, IH will be notified immediately.

4.0 TRAINING

The Project Specific Health and Safety Requirements Matrix, produced in conjunction with the PSHSP, gives training as well as other requirements for each task involved in the sampling project. This Matrix is included with this PSHSP as Attachment A.

4.1 HAZARD COMMUNICATION

4.1.1 Material Safety Data Sheets (MSDSs)

Two project field activities will use materials having an MSDS. These activities include preserving liquid sample aliquots with nitric acid, and decontamination of equipment with Alconox decontamination solution. The nitric acid, lead, and Alconox MSDSs are included in Attachment E of this PSHSP.

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4.1.2 Job Briefings/Safety Meetings

All personnel involved in this project shall be given PSHSP safety briefing (project training) prior to receiving authorization to begin work. The PSHSP safety briefing shall include review of this PSHSP. Also, personnel will be briefed on Radiological Control and RWP requirements by the RCT covering the sampling activities prior to commencement of field activities. In addition, a Tailgate Safety Meeting shall be held for all field staff at the beginning of each work day for the duration of this sampling project.

The job briefing/safety meeting shall be conducted by the CRU5 Health and Safety Officer/Assistant or designee. The frequency of job briefing/safety meeting sessions shall be determined by the FERMCO Site Characterization Department, Field Operations Manager. Daily Tailgate Safety Meetings shall be conducted by the FERMCO Site Characterization Department, Field Operations Manager and the ES&H, Industrial Hygiene (IH) Technician assigned to the field project.

All personnel involved in this project shall attend all project training sessions.

Written documentation of the briefings and tailgate safety meetings, in the form of attendance sheets, will be maintained, and retained as part of the project permanent record. File copies shall be forwarded to the CRU5 Health and Safety Officer/Assistant for review.

4.2 RECORDS

Documentation of training classes attended shall be by all attendees signifying by their signature on the Acknowledgement Form, which is Attachment H of this PSHSP.

Verification of project field staffs' attendance of all required OSHA, FEMP and FERMCO site training courses shall consist of employee training records on file within the FERMCO Training Department, FERMCO Medical Services, and the CRU5 and Environmental Division Training Coordinators.

4.3 VISITORS

Anyone accessing the field sampling locations for the sole purpose of observation or viewing the field work in progress (hands off inspections) is considered to be a "visitor." Visitors cannot operate any equipment, participate in the ongoing field activities, or supervise/oversee any field work activity.

All visitors shall be orientated to the hazards of the site and the control measures through the same means as all other project personnel. Visitors who are required to enter the Exclusion Zone shall also be dressed in the same types of Level **D** PPE as the field sampling staff.

Visitors will comply with the training requirements specified for the activities in progress. These requirements are specified on the project Health and Safety Matrix which is shown as Attachment A of this PSHSP.

Visitors who need to enter the contamination area (or Radiation or airborne Radioactivity Area) must receive prior authorization from the Manager of Radiological Control, and the Manager of Radiological Compliance.

Visitors who are required to enter the Exclusion Zone must receive authorization from the CRUS Health and Safety Officer/Assistant.

5.0 MEDICAL MONITORING AND SURVEILLANCE

5.1 REQUIREMENTS

All personnel engaged in the performance of project field activities are required to participate in the FEMP medical monitoring program.

5.2 RECORDS

The FERMCO Medical Services Department will maintain copies of all employee medical records.

6.0 HAZARD ASSESSMENT

This section addresses the identified health and safety hazards associated with the conduct of field activities covered by this PSHSP.

Potential hazards to field sampling personnel may originate from the chemical, physical, radiological, biological, and safety hazards known or suspected to be present at the sampling locations. Additional hazards to personnel during soil sample mixing are limited to hazards associated with the soil mechanical mixing apparatus, and dust generation if the soil being mixed is dry enough to generate dust during mixing.

6.1 RADIOLOGICAL ISSUES

Uranium can be found at the surface at various locations on the FEMP. In general, uranium concentrations should decrease with increasing depth below the land surface. Based on the information available at the time of preparation of this PSHSP, none of the sampling locations are known to be within an area where the Action Level for radiation from uranium is exceeded.

Uranium is a radioactive material and in its soluble forms is highly toxic. Soluble uranium is absorbed through the skin and can affect the kidneys. Insoluble uranium is an inhalation and radioactive hazard.

6.2 INDUSTRIAL HYGIENE ISSUES

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6.2.1 Heat Stress

All field personnel could potentially be affected by heat stress. In addition to the overall physical condition of field personnel, other factors such as temperature, relative humidity, work function, intake of fluids, PPE and duration of time exposed to the sun can greatly affect the degree of heat stress on an individual.

All FERMCO personnel have been trained to be able to identify the four stages of heat stress, and to be aware of the warning signs and symptoms. The four stages of heat stress, descriptions and symptoms are as follows:

Heat Rash - Often referred to as "Prickly Heat," is characterized by tiny, raised vesicles on the skin, or blister-like eruptions under the skin. Treatment includes the application of a mild drying lotion to the skin, and seeking medical attention.

Heat Cramps - Characterized by painful muscle spasms. Treatment includes administering liquids, and seeking medical attention.

Heat Exhaustion - Symptoms include pale, cool, moist, skin, heavy sweating, dizziness, nausea, and fainting. Treatment includes rest in a reclining position until water balances are restored, the administration of fluids (no caffeine) and seeking immediate medical attention.

Heat Stroke - By far the most dangerous, and potentially deadly stage of heat stress, is recognized by red, hot, dry skin, a lack of perspiration, nausea, dizziness and confusion, and a strong, rapid pulse. Treatment includes seeking immediate medical attention, and cooling down the affected person by immersion in cool water or by wrapping in a wet sheet with vigorous fanning with cool, dry air.

Sunburn - This hazard of outdoor summertime work is caused by prolonged exposure to ultraviolet light. Symptoms range from first degree to second degree burns. A suitable sunscreen on exposed areas will help to prevent sunburn.

Fluid Intake During Hot/Humid Weather - With the sudden arrival of very hot weather, everyone needs to consciously increase their fluid intake to compensate for increased losses of body water primarily through sweating. Many fluid types can help, however, the National Institute for Occupational Safety and Health (NIOSH) and most scientific studies have determined the best way to maintain hydration and help prevent heat-related illnesses is the frequent consumption of water.

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Water is more rapidly absorbed than fluids containing sugar and/or salts. Soft drinks have a large amount of sugar which slow the body's uptake of water. So-called "sports drinks" like Gatorade™, have both sugar and high salt content. They are marketed as a method to replace salts lost in sweat and provide calories in the form of sugar. While the sweat of people first exposed to heat does contain considerable salt, after 3-14 days of heat exposure, the body adjusts by sweating more but with much less salt loss. The average American diet contains more than enough salt to meet the need.

Sports drinks are therefore not recommended as the solution for replacement of body water and salts. The best replacement fluid remains water. Employees who wish to consume other fluids such as Gatorade™ should be aware of the short-comings but may obtain and use these fluids at their own expense.

Field staff will be instructed to notify IH when the ambient air temperature reaches 80 degrees Fahrenheit. At that time the mechanism of heat stress control will be mutually determined by IH and Environmental Division, Site Characterization Department staff.

Field staff will be supported by IH Technicians who will periodically measure the relative humidity and temperature to determine the time interval which field staff can perform work and when they should be on a break. All prescribed work/break intervals specified by the IH Technicians will be followed by the field staff.

6.2.2 Contact Burns

Laboratory personnel will use a laboratory oven, at approximately 140°F, to dry soil samples. Contact Burns are a hazard of using this oven. Insulated oven mitts will be used when inserting or removing soil containers so that no bare skin will contact a hot oven component.

6.2.3 Chemical Contaminants

Lead can be found at the surface at Locations K₁-SS-07, K₁-SS-08, and K₁-SS-09. However, as discussed in Section 3.1.3 of this PSHSP, the form of lead anticipated to be encountered which sampling staff could be exposed to would be in the form of particulates entrained in the atmosphere. Lead, in the form of lead shot is essentially insoluble under the ambient conditions of temperature and pressure to be encountered during sampling.

Alconox will be used as an equipment decontamination solution.

Nitric acid: approximately 1.0 ml/l of HNO₃ will be used to preserve liquid sample aliquots. The sampling staff may be exposed to splashes from accidental spills of sample aliquots containing nitric acid.

6.2.4 Biological Hazards

Biological hazards which could potentially affect field workers are limited to plants, insects and animals. The following subsections describe the nature of the hazards.

Plants - Plant life which has the highest potential for affecting project field workers includes poison ivy, poison oak, and poison sumac. Staff will be briefed during the project training sessions about what these poisons look like, and to avoid them if at all possible. If they know or suspect that an exposure has taken place, then they will be instructed to wash the affected body area as soon as possible following exposure. If the exposed body area does not respond to washing, or if the employee seems to display a hypersensitivity to poison exposure, then the employee will be sent to FERMCO Medical Services for treatment, or removed from the project.

Insects/Animals - A variety of insects, to include ticks, mosquitos, bees, wasps, and chiggers are the major insects of concern at the project field sampling locations. As is well evidenced by human reactions to most insect bites or stings, reactions are usually limited to skin irritations which may range from mild to extreme. Many humans display a hypersensitivity to such exposures. However, in many instances it may be virtually impossible to anticipate the reaction of an affected individual until after the exposure has occurred.

Staff who knowingly have a history of hypersensitivity to insect bites or stings should take the appropriate precautions through FERMCO Medical Services prior to the performance of field work where the potential for insect-related exposure is great.

In order to minimize the potential for health and safety related problems associated with insects, field staff will be instructed to:

- Wear FERMCO issued coveralls
- Avoid areas if high vegetation growth, if possible

- Avoid or minimize skin contact with any vegetation
- Avoid sitting on vegetation
- Use a manually operated weed cutter to clear the area prior to sampling, if necessary
- Take showers during the day, mandatory showering times are to be at lunch and at the end of shift
- Avoid the use of personal hygienic strongly fragrant items such as deodorant, perfume, cologne, etc., as these items often attract some insects
- Allow field staff to tape their coveralls at the ankles, if so desired, to control insects

Staff are free to use insect repellents, which are available through FERMCO Medical Services, and will be provided if requested.

Animal concerns consist predominantly of snakes. Both poisonous and nonpoisonous snakes are found in Southwest Ohio. Staff will be instructed that since snakes have no sense of hearing but respond readily to vibrations, if there is any concern that they may be entering an area where a snake may be located, simply take a rock, a handful of pebbles or other similar fairly heavy item and simply toss it into the area of concern. This should be adequate to frighten off any snakes in the area. Additionally, staff will be instructed to use caution when moving something which may have a void space which could contain a snake.

An additional animal concern to some people is the cattle that may be in the vicinity of the sampling locations. Cattle, especially dairy cattle are naturally curious animals who associate the presence of humans with either being fed, watered, or milked. Thus, it is not unusual for cattle to move towards humans. However, some people unfamiliar with cattle can, and often do become concerned about their own safety. Cattle can easily be frightened by a loud noise, such as shouting, or hand clapping. However, do not use any cattle intimidation tactics besides loud noises, as the cattle are privately owned, and we do not want to risk injuring the cattle or antagonizing the owners. If any field staff are still concerned and intimidated by the presence of cattle, they may be reassigned to another project.

6.3 SAFETY ISSUES

The following safety issues have been evaluated during the preparation of this PSHSP. Although many of the safety issues do not apply to this project, their evaluation has been performed to ensure that the issues have been considered.

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6.3.1 Physical Hazards

6.3.1.1 Lifting

Due to the nature of the field work associated with this project, any one employee lifting more than 50 pounds without assistance is highly unlikely. One possibility, the lifting of the sample cooler containing samples, will be performed by one than one person.

6.3.1.2 Electrified Fences

No sampling point is situated in close proximity to an electrified livestock fence. Sampling personnel and equipment, however, will be required to breach such fences, at established crossing points, to reach some of the sampling points. Personnel should take precautions to use the provided insulated disconnect handles when passing through electrified fences, and to avoid contact with other portions of the fence.

6.3.1.3 Power Backhoe

A construction backhoe will be used to excavate an access trench adjacent to one side of the sample square. Sampling technicians and other affected personnel shall remain separated from the backhoe, at a minimum distance of twice the maximum horizontal reach of the backhoe boom and bucket, when the backhoe is operating. The backhoe operator will place the bucket upon the excavated soil pile or natural soil surface, remove his or her hands and feet from the backhoe operating controls, and give a prearranged signal when persons may approach the excavation for measuring or other non-sampling purposes. The backhoe will be shut down and secured when sampling takes place. An Excavation and Trenching Permit, included as Attachment I, is required prior to trenching. Health and Safety requirements for subcontractors are found in Attachment M.

6.3.1.4 Sampling Trench

A trench for sampling purposes will be installed along one side of the sampling square. The trench will be approximately 3.5 feet deep, 2.5 feet wide, and 5 feet long. The trench back face, or face opposite the sampling face, will be sloped at a 1.5:1 angle to facilitate ingress and egress to and from the trench. A Work Permit, included as Attachment J, and a Hazardous Work Permit, included as Attachment K, are required prior to any work being performed in a trench. The designated Competent Person will inspect the trench to determine the potential for cave-in of trench sides, and will fill out a Daily and Prior to Work Trench Inspection Log, included as Attachment L, for every trench completed for sampling.

A competent person will be at the job site and shall be capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has

the authorization to take prompt corrective measures to eliminate them and to have the "stop work authority." This person(s) shall be fully aware of all the requirements of 29CFR1926 Subpart P, Excavations.

Excavations shall be inspected prior to the start of work daily and as needed throughout the shift. Inspections shall be made after each rainstorm or other hazard increasing occurrence. All inspections shall be documented and maintained until the trench is backfilled or work is completed. All inspections shall be completed by a competent person.

All excavations/trenches shall have barricades and/or guard rails installed to prevent falling into the depression. No excavation shall be open at the close of daily operations.

6.3.1.5 Sanitation

An adequate supply of potable water shall be provided at the work location. Containers used to dispense drinking water shall be capable of being tightly closed, and equipped with a tap. Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not for any other purpose.

All drinking water locations within a radiological controlled area shall be reviewed by the FERMCO Radiological Control Department prior to use. Personnel shall be provided with a means of getting to site toilet facilities. Under no circumstances will any employee be physically located greater than 5 minutes from toilet facilities.

If employee exposure to contaminants is suspected, an adequate supply of potable water will be available for their personal use.

6.3.1.6 Underground Utilities

All underground utilities will be identified during the acquisition of the Penetration Permit.

6.3.2 Fire Protection

The potential for explosion during the performance of project field work is nearly nonexistent. The only possible source of an explosion hazard is from the vehicles used to access the work site. With normal use of the vehicles, and by following established FEMP and common sense work practices, explosions should not be a problem.

The potential for fires, as with explosions, is nearly nonexistent. In addition to the potential for fire hazard from location access vehicles, the primary additional fire source is dry vegetation in the vicinity of the sampling sites. Personnel will be instructed to avoid smoking or parking the vehicles in locations where potentially combustible materials could be ignited.

Please insert the following section after Section 6.3.1.6 on page 14 of the K_L Soil Sampling Project PSHSP.

6.3.1.7 *In Vitro* Soil Preparation

Dried soil will be pulverized in the lab prior to homogenization using a 1-liter capacity Waring^R blender with a 7 amp motor. The blender container and blades are stainless steel and the cap is rubber and plastic. The blender components will be decontaminated between samples.

Soil pulverizing with the blender will be performed in a ventilated lab hood. Five hundred (500) milliliters of soil will be the maximum amount pulverized in one operation.

Other combustible materials, such as dirty PPE, and sampling related debris will be removed at daily intervals during the course of sampling. Disposal of such material shall be in accordance with established FERMCO waste disposal requirements.

7.0 HAZARD CONTROL

7.1 ENGINEERING/ADMINISTRATIVE CONTROLS

When feasible, engineering controls will be used to control physical, chemical and radiological hazards. Engineering controls anticipated to be used during the work covered by this PSHSP shall include:

- Limited ingress and egress to the sampling location
- Establishment of zones surrounding the work sites
- Containment of inorganic or radiologically contaminated equipment and PPE
- Restricted access by personnel if dust entrainment at sampling locations is noted by the IH technician
- Air purifying respirators for field personnel if determined to be necessary by RCT/IH technicians
- Decontamination of equipment and personnel genuinely or potentially affected by the presence of inorganic contamination
- The use of PPE typically used for Level D field work, including steel toed safety boots, standard issue FERMCO work clothing, gloves and safety glasses
- The use of deionized water mist as a dust suppressant, if required during sampling
- Ensure that only a Qualified Operator is assigned to operate the backhoe during trench excavation.

Additionally, field staff will be instructed to wash their hands thoroughly prior to eating, drinking, and smoking.

7.2 PERSONAL PROTECTIVE EQUIPMENT/RESPIRATORY PROTECTION

The level of personal protective equipment and respiratory protection to be worn by field personnel performing project activities is defined on an activity basis in the Health and Safety Requirements Matrix. Modifications to the described PPE ensembles may be necessary for some field activities if conditions change.

Should conditions change and a subsequent change of PPE become necessary, changes will be made based on a review of specific hazards, weather, work conditions, operating requirements, and air monitoring at the work location. Additionally, respiratory protection may be upgraded or downgraded, as deemed appropriate by the CRU5 Health and Safety

Officer/Assistant or designee and the IH Technician within the constraints of this PSHSP. With written approval of the CRU5 Health and Safety Officer/Assistant, substitution of some PPE items may be appropriate. Approved written revisions will be made in the PSHSP.

The IH Technician, in addition to Project personnel, shall be responsible for ensuring that all personnel are wearing the appropriate level of PPE for their respective work function.

8.0 DECONTAMINATION

8.1 SITE DECONTAMINATION REQUIREMENTS

8.1.1 Personal

Sampling personnel are required to contact Radiological Control Technicians in the event of a personnel contamination incident. Detection of a count rate above background with a field portable GM monitoring instrument ("frisker") should alert personnel of possible contamination. Ambient background count rate is not to exceed 300 counts per minute (CPM) in the location of the personnel monitoring. If background levels exceed 300 CPM, proceed to an area of lower background to perform the personal monitoring of the potentially contaminated individual. Ideal background levels would be less than 100 CPM. Responding RCTs are to follow the instructions given in ES&M procedures OSH-P-35-017, "Procedure for Personnel Decontamination" and SP-P-35-031, "Event Notification and Reporting of Radiological Control Occurrences." Personnel involved in the incident are to follow the instructions given in Section 4.3 of this Health and Safety Plan for bioassay evaluation of potential internal radiation hazard from possible inhalation, ingestion, or absorption of radioactive materials.

8.2 LOCATION AND VERIFICATION OF NEAREST WATER

8.2.1 Location

Location of the nearest water for decontamination and eye washing will be verified by the CRU5 Health and Safety Officer/Assistant prior to any sampling activities. Location is the sampling equipment/supply truck or van.

8.2.2 Verification of Operability

Operability of water source and eye wash station will be verified prior to start of work by the Project Team Leader.

8.3 EQUIPMENT

Equipment to be used during soil media sampling shall be decontaminated in accordance with the Project Specific Plan and Sitewide CERCLA Quality Assurance Project Plan (SCQ) requirements. A 2 percent solution of Alconox will be used for equipment decontamination. Decontamination shall be performed at a frequency which is required to maintain sample integrity and to avoid the possibility of cross-contamination from one discrete sampling location or horizon to another discrete sampling location or horizon.

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Between equipment decontamination events, a RCT shall monitor the equipment contamination of radiological constituents when the equipment being transferred to an area of lesser control. In addition, a number of equipment rinsate samples, as stated in the PSP, shall be collected to verify the adequacy of decontamination.

Equipment for the decontamination of radiological or inorganic hazards shall be kept available in the area surrounding the controlled areas. Upon exiting the work area, workers will be instructed by RCTs and/or IH about how to frisk, in which containers to place disposable and washable PPE, and what to do if personal radioactive contamination is detected.

9.0 EMERGENCY/CONTINGENCY PLANS

9.1 REPORTING

9.1.1 Emergency Numbers

NAME	FEMP TELEPHONE NUMBER	RADIO *
Ambulance	738-6511	CONTROL
Hospital	738-6511	CONTROL
Fire	738-6511	CONTROL
Security	738-6511	CONTROL
Emergency Response	738-6511	CONTROL
CRUS Health & Safety Manager	738-6897/6789	307/Freq 6
Industrial Hygiene	738-6207	357
Radiological Control	738-9744/6433	350
2nd and 3rd shift	355	
Fire and Safety Inspectors	738-6235	303
Assistant Emergency - Duty Manager (AEDO)	738-6295 / 6431	202
Accountability	738-6202	

* Call numbers listed are for FERMCO Frequency 2.

9.1.2 Site Notification Procedures

All FEMP emergencies shall be reported to the FERMCO "Communication Center" to ensure rapid response. A means to report an emergency shall be available at all work locations whenever personnel are working. This may be accomplished by one of the following methods:

- Phone 738-6511
- Radio to "Control"

Any injury, no matter how minor, shall be reported immediately to FEMP Medical for evaluation or treatment. The injured employee shall be accompanied to medical by the supervisor in charge or designee. The FERMCO CRUS Director, Environmental Division Director, and CRUS Health and Safety Officer/Assistant shall be notified as soon as possible after the injury/accident has occurred.

Employees working will be notified of emergency or abnormal conditions by the plant wide alarm system and radio announcements. This announcement follows the sounding of the site alarm horn signal, 3-3.

9.1.3 What to Report

The following are examples of emergencies that would justify calling and reporting an emergency:

- Serious injury
- Injury Complicated by Contamination
- Chemical/Radiation Release
- Chemical Splash (Eye and Skin)
- Any Fire
- Major Property Damage
- Detrimental Weather Conditions
- Property Damage
- Unusual Occurrence(s)

When an emergency or abnormal condition is observed, personnel shall contact the Communications Center at extension 6511 or via radio (CONTROL) for emergencies. Stay on the phone line until the dispatcher hangs up.

The following information must be given to the Communications Center operator:

- Name
- Badge number
- Location where emergency has occurred
- Nature of the emergency
- Number of personnel with injuries
- Unusual conditions (odors, symptoms, vapors, smoke)
- Current status of the emergency

9.2 EVACUATION ROUTES/ACCOUNTABILITY

9.2.1 Rally Point Accountability

Should a situation require an emergency evacuation of the work area, all equipment should be turned off (if possible) and left in place. On-site personnel should immediately proceed to the nearest established rally point as identified on the map found in Attachment C. If field staff are not in close proximity to an established Rally Point, the field staff supervisor shall establish a rally point at an established location which all field staff will be made aware of.

9.2.2 In-Place Accountability

When in-place accountability is required, employees shall contact their supervisor and report their current position. The supervisor in charge shall report the names of any unaccounted personnel to his or her management within 10 minutes.

9.3 EMERGENCY EQUIPMENT

9.3.1 FEMP Site Equipment

The FEMP Medical Facility is staffed and equipped to handle most types of medical emergencies that would occur during a task. The medical facility is staffed with Emergency Medical Technicians (EMTs) and is equipped with an ambulance to transport the injured person to the nearest off-site hospital should extended or specialized treatment be necessary.

The FEMP Medical Facility is located at the east end of the first floor of the ES&H Building (Building 53). The location of the FEMP Medical Facility is shown on the map which is Attachment D.

9.4 EMERGENCY RESPONSE

The FEMP Emergency Services will handle all on-site emergencies. Any request for emergency help should be requested by telephone (738-) 6511 or on any FEMP radio frequency by calling "CONTROL."

9.4.1 Medical Emergencies

The FEMP Medical Department and emergency site ambulance shall serve as the first-aid person, as they can respond within 3-4 minutes to FEMP site emergencies.

9.4.2 Fire Emergencies

All work sites shall maintain effective communication to summon fire fighting assistance. Access to the work area shall be maintained at all times to permit fire trucks and fire fighting crews to safely approach the fire emergency.

Only trained personnel shall attempt to operate any fire fighting equipment and only when the fire is clearly within the capability of the fire fighting equipment. All sampling vehicles are equipped with hand-operated fire extinguishers.

The FEMP Emergency Response Team (ERT) will also respond to all on-site fire emergencies. For any fire emergency at the FEMP, call (738-) 6511.

9.4.3 Explosion Emergencies

When an explosion has occurred the following actions are to be taken:

- Activate nearest fire alarm if possible

"NOTE": Other affected employees must be notified of a fire by alternate methods if a fire alarm is not available.

- Evacuate building or work area
- Proceed to an appointed rally point
- If qualified, render first aid to any injured personnel
- Instruct all persons in transit to avoid the work area and surrounding area
- Contact CONTROL by radio or phone (6511)
- Call for medical assistance if necessary
- Report to supervisor for accountability

9.4.4 Chemical Emergencies

9.4.4.1 Splashes

Project activities are such that chemicals will be used for decontamination activities and sample preservation. This decontamination solution, Alconox, is the material which has the highest potential for being involved in a chemical splash incident. Nitric acid, at 1 ml per liter as a sample preservative, has somewhat less of a potential of being in a splash incident. These MSDSs are included as part of this PSHSP in Attachment E.

Should a project employee be involved in a chemical splash incident with a chemical other than Alconox, the clothing affected will be immediately removed. Then, the area of skin affected will be flushed with clean water for 15 minutes. Then, the affected employee will report to FERMC O Medical Services.

9.4.4.2 Personal Contamination

Due to the limited nature of project field activities, equipment and materials involved, personal contamination from either caustic or corrosive materials is highly unlikely. However, should such a contamination event occur, the action would be to flush the affected area with clean water for a minimum of 15 minutes. Then the affected employee will immediately report to FERMC O Medical Services.

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When personal contamination occurs from other than caustic or corrosive materials, immediately contact Industrial Hygiene and remain at the work location until a representative of Industrial Hygiene arrives and provides further instructions.

9.4.5 Radiological Emergencies

9.4.5.1 Releases

If a release of suspect or known radiological contaminants takes place, the release area shall be evacuated. The supervisor in charge, Assistant Emergency Duty Officer Radiological Control Technicians, and the CRU5 Health and Safety Officer/Assistant shall be notified of the release.

9.4.5.2 Personal Contamination

Contamination should be avoided when possible by minimizing contact with the contaminant. All instances of personnel radiological contamination must be reported to Radiological Control, CRU5 Health and Safety Officer/Assistant, FERMCO Project Manager, and the Assistant Emergency Duty Officer.

9.4.6 Weather Limitations/Adverse Conditions

Any outside work will be suspended if warnings for high winds, lightning, thunderstorms, or tornadoes are sounded. If field personnel are not able to find shelter in a fixed structure, then they shall utilize their work vehicles as temporary shelter.

9.4.7 Accident Investigation

Any injury or accident shall require the supervisor to complete an accident report. This report shall be completed within 24 hours of the event and forwarded to the FERMCO Worker's Compensation Coordinator at site mail stop #31. Should a serious accident/injury occur, the involved area should not be disturbed until approved by the CRU5 Health and Safety Officer/Assistant.

10.0 CHANGES/AMENDMENTS TO THE PSHSP

This PSHSP for CRU5 field activities is based on information available at the time of preparation. It is important that personnel protective measures be routinely reassessed by supervision, project management and the CRU5 Health and Safety Officer/Assistant. In addition, unexpected conditions/events may arise which require reassessment of the health and safety issues. Downgrading of precautions, personal protective equipment, etc. identified in this plan must be approved in writing by the CRU5 Health and Safety Officer/Assistant, or designee. Amendments to this plan are not required for such changes in activity; however, formal documentation of the change must be made.

Unplanned operations and/or changes in work scope shall require a review and may require an amendment to the PSHSP. All amendments must be approved by the CRU5 Director, CRU5 Health and Safety Officer/Assistant and the Manager of Occupational Safety and Health.

10.1 CONTROL OF HEALTH AND SAFETY PLAN

For the purpose of ensuring that all personnel are informed of any changes in the scope of this PSHSP, CONTROLLED copies of this document shall be maintained by ES&H Document Control. Only essential personnel shall maintain controlled copies of this document. The following table is the list of personnel with the controlled copies of this PSHSP.

TITLE	PRIMARY	ALTERNATE
Manager, Occupational Safety and Health Compliance	Daryl Mills	Ken Miller
Manager, Construction Health & Safety Compliance	Ken Miller	Daryl Mills
Project Director, CRU5	Dave Brettschneider	Mark Jewett
Manager, CERCLA/RCRA Unit 5 Health and Safety	Gregg Johnson	Kevin Murrin
CRU5 Health and Safety Officer/Assistant	Jeff Middaugh	Greg Lastoria
Environmental Division, Site Characterization Department Manager	Doug Harmel	Linda Rogers
Field Program Development Manager	Karen Voisard	Dan Stropes

Changes, corrections and/or additions not directed through ES&H Document Control will not be considered "controlled and approved." Operations conducted under such plans will be subject to work stoppage until control numbers are assigned.

10.2 REVIEW OF CONTENTS

This PSHSP will be reviewed at a frequency determined by the CRU5 Health and Safety Officer/Assistant for currency and applicability to job tasks. Required revisions (only affected pages) will be submitted to ES&H Document Control for update and distribution.

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ATTACHMENT A
PROJECT-SPECIFIC
HEALTH AND SAFETY REQUIREMENTS
MATRIX

HEALTH AND SAFETY REQUIREMENTS MATRIX
 Project Name: K, SOIL SAMPLING AND ANALYSIS RI/FS WBS NO.: 50.03.27

ACTIVITY (TASKS)	HAZARD IDENTIFICATION	FREQUENCY & TYPE OF AIR AND PERSONNEL MONITORING REQUIRED	PERSONNEL PROTECTIVE EQUIPMENT	TRAINING REQUIREMENTS	MEDICAL MONITORING & SURVEILLANCE REQUIREMENTS	ADMINISTRATIVE & ENGINEERING CONTROL MEASURES	PERMIT	DECONTAMINATION & DISPOSAL PROCEDURES
1.0 Minimum Project Requirements	1.1 CERCLA Site	Dosimeter (TLD)		<ul style="list-style-type: none"> Site Worker and Refresher Site Specific Orientation Red I or Red II as shown below 	<ul style="list-style-type: none"> FERMCO or approved physical Initial, annual, and termination In-Vivo 	Visitor escort	General Work Permit	
	1.2 Basic Soil Media Sampling		Safety glasses with rigid side shields, steel-toed shoes	Construction rules/regulations, GET & refresher, OSHA 500 (supervisors)				
	1.3 Hub and Stake Installation						Penetration	
	1.4 Buried Utilities						Penetration	
2.0 Conduct Task-Specific Training	2.1 Backhoe operation and trench inspection			Competant Person training		Will document all training		
3.0 Conduct Readiness Review								
4.0 Mobilization								
5.0 Excavation and Trenching	5.1 Being Struck by Backhoe/Boom/Bucket			The Competant Person shall be trained to the OSHA standards for operating a backhoe		Sampling Personnel shall remain twice the distance of the extended boom away from the operating backhoe		
	5.2 Falling into Trench					Barracade tape erected around excavation		

The requirements of this document are based upon current conditions and/or planned or current operations in areas near the planned construction zone. This Document is to be used as an aid in conjunction with the Project Specific Health and Safety Plan and assist the contractor in understanding the requirements of the project. This PSH&S Plan will provide more detail for certain aspects of this document. This document does not relieve the contractor of planning for or providing a safe work site. This document does not relieve the contractor from recognizing and complying with all appropriate Local, State and Federal regulations.

HEALTH AND SAFETY REQUIREMENTS MATRIX
 Project Name: K, SOIL SAMPLING AND ANALYSIS RI/FS WBS NO.: 50.03.27

ACTIVITY (TASKS)	HAZARD IDENTIFICATION	FREQUENCY & TYPE OF AIR AND PERSONNEL MONITORING REQUIRED	PERSONNEL PROTECTIVE EQUIPMENT	TRAINING REQUIREMENTS	MEDICAL MONITORING & SURVEILLANCE REQUIREMENTS	ADMINISTRATIVE & ENGINEERING CONTROL MEASURES	PERMIT	DECONTAMINATION & DISPOSAL PROCEDURES
	5.3 Collapsing Trench			The Competant Person shall be trained to the OSHA standards for excavation/trenching safety		Permit evaluation by Competant Person	Excavation and Trenching Permit, Trench Inspection Log, Hazardous Work Permit	
	5.4 Airborne Dust	As Required by IH	As Required			Deionized water spray and/or plastic underlayment and covering of excavated material will be used for dust control		
6.0 Sample From Trench Using Scoop - 15 Locations	6.1 Uranium Contamination		Level D	RAD II and Refresher	Urinalysis every 60 days	Contamination zone established, covering of excavated material	RWP	
	6.2 Lead Exposure		Gloves (Latex)			Wash hands and face before eating or smoking	Penetration	
	6.3 Plant/Animal Exposure							
	6.4 Underground Utilities						Penetration permit for work	
	6.5 Heat Stress			Ice Vest			Contact IH at 80° F	
	6.6 Inclement Weather						Exit area if lightning occurs	

The requirements of this document are based upon current conditions and/or planned or current operations in areas near the planned construction zone. This Document is to be used as an aid in conjunction with the Project Specific Health and Safety Plan and assist the contractor in understanding the requirements of the project. This PSH&S Plan will provide more detail for certain aspects of this document. This document does not relieve the contractor of planning for or providing a safe work site. This document does not relieve the contractor from recognizing and complying with all appropriate Local, State and Federal regulations.

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HEALTH AND SAFETY REQUIREMENTS MATRIX
 Project Name: K, SOIL SAMPLING AND ANALYSIS RI/FS WBS NO.: 50.03.27

ACTIVITY (TASKS)	HAZARD IDENTIFICATION	FREQUENCY & TYPE OF AIR AND PERSONNEL MONITORING REQUIRED	PERSONNEL PROTECTIVE EQUIPMENT	TRAINING REQUIREMENTS	MEDICAL MONITORING & SURVEILLANCE REQUIREMENTS	ADMINISTRATIVE & ENGINEERING CONTROL MEASURES	PERMIT	DECONTAMINATION & DISPOSAL PROCEDURES
	6.7 Confined Space					Trench depth \leq 42", backside sloped 2:1; not confined space		
	6.8 Hazard injury to personnel in trench			The competent person shall be trained to the OSHA standards for excavation/trenching safety		Competent person shall inspect prior and during soiling sampling to ensure safe trench conditions	General work permit. Open flame, welding and hazardous work permit. Excavation permit	
	6.9 Hazard - Nitric acid - injury to personnel		goggles and chemical resistant gloves			Personnel not involved will be removed from area. Eye wash will be made available		
7.0 Prepare Samples	7.1 Uranium Contamination (dust)		Level D	RAD II and refresher	Urinalysis every 60 days		RWP	
	7.2 Dry Soil Samples		heat-resistant oven "mitts" for handling soil drying pans			Personnel not involved will not approach drying oven.		
	7.3 Mix Soil Samples in Laboratory							
	7.4 Package Sample Containers							
	7.5 Archived Samples							

The requirements of this document are based upon current conditions and/or planned or current operations in areas near the planned construction zone. This Document is to be used as an aid in conjunction with the Project Specific Health and Safety Plan and assist the contractor in understanding the requirements of the project. This PSH&S Plan will provide more detail for certain aspects of this document. This document does not relieve the contractor of planning for or providing a safe work site. This document does not relieve the contractor from recognizing and complying with all appropriate Local, State and Federal regulations.

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Please insert the following into page 2 of Attachment A, Project-Specific Health and Safety Requirements Matrix of the K_L Soil Sampling Project PSHP.

ACTIVITY (TASKS)	HAZARD IDENTIFICATION	FREQUENCY & TYPE OF AIR AND PERSONNEL MONITORING REQUIRED	PERSONNEL PROTECTIVE EQUIPMENT	TRAINING REQUIREMENTS	MEDICAL MONITORING & SURVEILLANCE REQUIREMENTS	ADMINISTRATIVE & ENGINEERING CONTROL MEASURES	PERMIT	DECONTAMINATION & DISPOSAL PROCEDURES
7.0 Prepare Samples	7.6 Pulverize soil - injury from blender blades		Level D			Blender lid will be in place when blender is in operation	RWP	
	7.7 Pulverize soil - dust	As required by IH and/or RC	Level D		Urinalysis every 60 days	Blender will be used in lab hood.		

ATTACHMENT B
PERSONNEL ENVIRONMENTAL
MONITORING ACTION LEVELS

RADIOLOGICAL CONTROL ACTION LEVEL

MEASUREMENT	LEVEL	ACTION/RESPIRATORY PROTECTION <small>NOTE 1,5,7</small>
Alpha Probe	1,000 dpm/100cm ²	Contact Radiological Control Technician @ ext. 6889.
Beta/Gamma Probe	1,000dpm/100cm ²	Contact Radiological Control Technician @ ext. 6889.
U-238, Th-230, and Th-232	> 0.10 x DAC ^{note 4}	Area posted as "Airborne Radioactivity Area"
U-238, Th-230, and Th-232	> 0.25 x DAC	Full-faced air purifying respirator
U-238, Th-230, and Th-232	> 1.0 x DAC	Full-faced air purifying respirator with anti-C hood
U-238, Th-230, and Th-232	> 5.0 x DAC	Hooded air-supplied respirator
U-238, Th-230, and Th-232	> 10.0 x DAC	Contact Radiological Engineering
U-238, Th-230, and Th-232	> 40.0 x DAC	Invivo and/or Invitro sampling required by RC Dosimetry.
Rn-220	> 0.1 WL	Area posted as "Airborne Radioactivity Area"
Rn-220 daughters	< 0.25 Work Level (WL)	None
Rn-220 daughters	0.25 - 5.0 WL	Full-faced air purifying respirator (Hood required)
Rn-220 daughters	> 5.0 WL	Hooded air supplied respirator
	> .033 WL	Area posted as "Airborne Radioactivity Area"
Rn-222 daughters	< 0.075 WL	None
Rn-222 daughters	0.075 - 1.65 WL	Full-faced air purifying respirator (Hood required)
Rn-222 daughters	> 1.65 - 33.0 WL	Hooded air-supplied respirator
Rn-222 daughters	> 33.0 WL	SCBA or air-supplied bubble suit

0882

ACTION LEVELS FOR AIRBORNE RADIOACTIVITY

RADIONUCLIDE	1 DAC ^{NOTE 8} (uCi/ml)	10% DAC ^{NOTE 8} (uCi/ml)	25% DAC ^{NOTE 8} (uCi/ml)	WITHDRAW ^{NOTE 7,8 & 9} (uCi/ml)
Th-230	3 E-12	3 E-13	7.5 E-13	1.5 E-11
Th-232	5 E-13	5 E-14	1.25 E-13	2.5 E-12
U-238	2 E-11	2 E-12	5.0 E-12	1.0 E-10
Rn-220	8 E-09*	0.1 WL	0.25 WL	5.0 WL
Rn-222	3 E-08*	0.033 WL	0.0825 WL	1.65 WL

* Assumed 100% equilibrium with radon daughter products. If air sampling is performed for radon daughter

concentrations (i.e., Working Level measurements), the DACs are:

Rn-220 (thoron) daughter activity: 1.0 WL

Rn-222 (radon) daughter activity: 0.33 WL

INDUSTRIAL HYGIENE ACTION LEVELS

MEASUREMENT	LEVEL	ACTION
PID*	Detection to 10 ppm	Note 2
PID*	10 - 25 ppm	Supplied -Air Respirator
PID*	> 25 ppm	Withdraw
CGI	Lower Explosion Limit	Withdraw
CGI	2% of the LEL or greater	Note 6
Oxygen Meter	Oxygen < 20.5% or > 21.5%	Withdraw
Oxygen Meter	Sulfide > 3 ppm, or Carbon Monoxide > 10ppm Oxygen < 20.1% or > 21.9%	Withdraw
Asbestos	0.01 f/cc	Withdraw

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Notes

1. Area shall be posted as an "Airborne Radioactivity Area" by Radiological Control. Full-faced air purifying (magenta filter cartridge) respirator required until air monitoring data can verify < 25% DAC or the potential does not exist to exceed 25% DAC.
2. Combination particulate and organic vapor/acid gas filter (yellow and magenta) cartridge required.
3. See Section 1 for job specifics.
4. ~~Derived Air Concentrations (DAC) for radionuclide(s) of interest.~~
5. Air sample results which indicate that individuals may have been exposed to 40 DAC-hours or more per week shall trigger internal dosimetry assessment (e.g. invitro and/or invivo assessments).
6. For a range of 2% to 10% contact Industrial Hygiene. For greater than 10% contact Fire Safety.
7. Invitro and/or invivo assessments may be required at levels less than 40 DAC-hours per week, if deemed necessary by the Radiological Control department.
8. Currently, real-time monitoring for long-lived (U-238, Th-230, and Th-232) airborne radioactivity, in the presence of short-lived radon/thoron daughter activity, is not always possible. Refer to "retrospective" seven day count (long-lived) data for the affected area, if this data is available. Otherwise, assigned respiratory protection shall be based on the potential to exceed the Action Levels, or on confirmation of the airborne radioactivity levels present by special counting methods.
9. The "Withdraw" values are based on 5.0 x DAC. Hooded Air Supplied Respirator is required at those levels. If airborne radioactivity levels can exceed 10.0 x DAC, contact Radiological Engineering.

• - Industrial Hygiene will be notified if PID readings are greater than 5ppm.

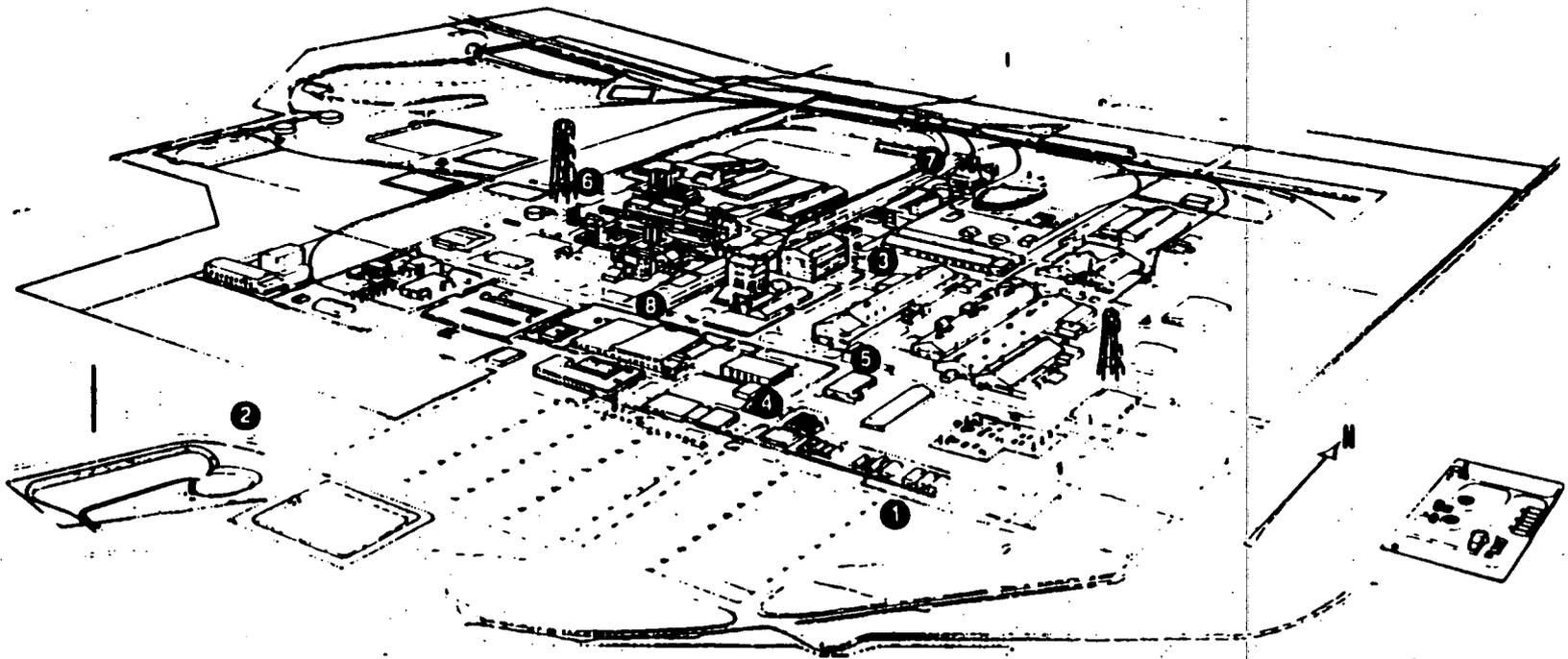
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ATTACHMENT C
FEMP RALLY POINTS

000107



FEMP RALLY POINTS



The FEMP maintains eight Rally Points.

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ATTACHMENT D
LOCATION OF FEMP MEDICAL FACILITY

000109

ATTACHMENT E

WORK AREA MATERIAL SAFETY DATA SHEETS (MSDSs)

000111

Material Safety Data Sheet
Required under USOC Safety and Health Regulations
for Hazardous Employment (29 CFR 1910.120)

ALCONOX POWDER DETERGENT
U.S. Department of Labor
Occupational Safety and Health Administration

10106

OSHA No. 1216-0074
Expiration Date 06/31/88

PREPARED 1/2/85

Section I

Manufacturer's Name
ALCONOX, INC.

Address (Number, Street, City, State, and Zip Code)
**215 PARK AVENUE SOUTH
NEW YORK, N.Y. 10003**

Emergency Telephone Number
(212) 473-1300

Chemical Name and Synonyms
N.A.

Trade Name and Synonyms
ALCONOX

Chemical Family
ANIONIC DETERGENT N.A.

Section II - Hazardous Ingredients

Percent by Weight	TLV (A) (mg/m ³)	TLV (T) (mg/m ³)	TLV (C) (mg/m ³)
None			

Section III - Physical Data

Boiling Point (°F) **NONE**

Vapor Pressure (mm Hg) **N.A.**

Vapor Density (Air=1) **N.A.**

Specific Gravity (4/4) **N.A.**

Percent Volatile by Volume (V) **N.A.**

Evaporation Rate **N.A.**

Stability in Water **APPRECIABLE**

Appearance and Color **WHITE POWDER INTERSPERSED WITH CREAM COLORED FLAKES - ODORLESS**

RECEIVED
AUG 1985
RECEIVED

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used) **NONE**

Flammable Limits **N.A.**

Explosion Limits **N.A.**

Extinguishing Media **WATER, CO₂, DRY CHEMICAL, FOAM, SAND/EARTH**

Special Fire Fighting Procedures
FOR FIRES INVOLVING THIS MATERIAL, DO NOT ENTER WITHOUT PROTECTIVE EQUIPMENT AND SELF CONTAINED BREATHING APPARATUS

Unusual Fire and Explosion Hazards
NONE

HYGIENE AND SAFETY PRACTICES EMPLOYED WITH ANY INDUSTRIAL CHEMICAL.

NO SPECIAL REQUIREMENTS OTHER THAN THE GOOD INDUSTRIAL

PREVENT CARING

SHOULD BE STORED IN A DRY AREA TO

NOT REQUIRED

USEFUL - NOT REQUIRED

USEFUL - NOT REQUIRED

N.A.

N.A.

N.A.

NORMAL

DUST MASK

FOR NON-HALOGENOUS DETERGENT QUANTITIES SHOULD BE DISPOSED OF ACCORDING TO LOCAL REQUIREMENTS

SMALL QUANTITIES MAY BE DISPOSED OF IN SEWER - LARGE

BIODEGRADABLE

AS MUCH AS POSSIBLE, RISE REMAINDER TO SEWER. MATERIAL IS COMPLETELY

MATERIAL FOAMS PROPERLY. SHOVEL AND RECOVER

MAY RELEASE CO2 GAS ON BURNING

AVOID STRONG ACIDS

NONE

TO DILUTE MATERIAL. GET MEDICAL ATTENTION FOR DISCOMFORT.

PLENTY OF WATER. INGESTION - DRINK LARGE QUANTITIES OF WATER

EYES - FLUSH WITH PLENTY OF WATER FOR 15 MINUTES. SKIN-FLUSH WITH

PROLONGED EXPOSURE TO DUST MAY IRRITATE MUCOUS MEMBRANES

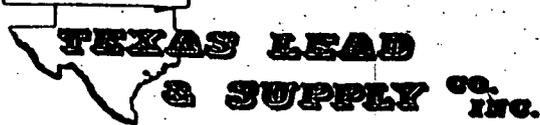
NO DATA AVAILABLE - TREAT AS NUISANCE DUST

Handwritten: Hazardous
44-377-88150

05830

10324
LEAD

WE NEVER COMPROMISE QUALITY FOR QUANTITY



Phone 713 683-3800
1400 CENTRAL CREST
HOUSTON, TEXAS 77068

DEC 17 1991



MATERIAL SAFETY DATA SHEET

VENDOR AND THIRD PERSONS ASSUME THE RISK OF INJURY PROXIMATELY CAUSED BY THE MATERIAL IF REASONABLE SAFETY PROCEDURES ARE NOT FOLLOWED AS PROVIDED FOR IN THE DATA SHEET, AND VENDOR SHALL NOT BE LIABLE FOR SUCH INJURY. FURTHERMORE, VENDOR SHALL NOT BE LIABLE FOR INJURY TO YEMER OR THIRD PERSONS PROXIMATELY CAUSED BY ABNORMAL USE OF THE MATERIAL EVEN IF REASONABLE SAFETY PROCEDURES ARE FOLLOWED.

ALL PERSONS USING THIS PRODUCT, ALL PERSONS WORKING IN AN AREA WHERE THIS PRODUCT IS USED, AND ALL PERSONS HANDLING THIS PRODUCT SHOULD BE FAMILIAR WITH THE CONTENTS OF THIS DATA SHEET. POSTING THIS DOCUMENT FOR EMPLOYEE NOTIFICATION IS RECOMMENDED BY THE VENDOR.

TRADE NAMES		Soft Lead
SYNONYMS		Calcium, Strontium and/or Tin Lead Alloy; Pure Lead
INTENDED USE		Industrial
II HAZARDOUS INGREDIENTS		
MATERIAL OR COMPONENT (CAS#)	WEIGHT %	HAZARD DATA
Lead (CAS# 7439-92-1)	97-100	<i>500 mg/m³</i>
Calcium (CAS# 7440-70-2)	0-3	5 mg/m ³ *
Strontium (CAS# 7440-24-6)	0-3	N/A
Tin (CAS# 7440-31-5)	0-3	2 mg/m ³ **
Copper (CAS# 7440-50-8)	0-1	100 mg/m ³ *
Aluminum (CAS# 7429905)	0-1	5 mg/m ³ *
*Ref: Occupational Safety & Health Standards, General Industry Standards Part 1910 **1981 ACGIH Threshold Limit Values		
III PHYSICAL DATA		
BOILING POINT @ 760 MM Hg	Greater than 2709°F	MELTING POINT 621-1112°F
SPECIFIC GRAVITY (H ₂ O = 1)	11.0 - 11.3	VAPOR PRESSURE Not Applicable
VAPOR DENSITY (AIR = 1)	Not Applicable	SOLUBILITY IN H ₂ O (% BY WT) Negligible
% VOLATILES BY VOL	Not Applicable	EVAPORATION RATE (BUTYL ACETATE = 1)
APPEARANCE AND ODOR	Metallic silver-gray; no apparent odor	

IV HEALTH HAZARD INFORMATION

1126

Routes of Exposure When Processing or Handling

Inhalation	Dust, vapor and/or fume may be irritating to the respiratory system, and can result in both acute and chronic overexposure.
Skin Contact	Dust, vapor and/or fume may cause irritation.
Skin Absorption	Dust, vapor and/or fume are not readily absorbed through the skin.
Eye Contact	Dust, vapor and/or fume may cause irritation.
Ingestion	Dust, vapor and/or fume may be absorbed by the digestive system, and can result in both acute and chronic overexposure.

Effects of Overexposure

Acute Overexposure	If left untreated: headache, chills, nausea, weakness, vomiting, loss of appetite, uncoordinated body movements, convulsions, stupor, and possibly coma.
Chronic Overexposure	If left untreated: weakness, insomnia, hypertension, slight irritation to skin and eyes, metallic taste in mouth, anemia, constipation, headache, muscle and joint pains, metal fume fever, ulceration of nasal septum, neuromuscular dysfunction, possible paralysis and encephalopathy.

Emergency and First Aid Procedures

Eyes	Flush with copious quantities of water. Get immediate medical attention.
Skin	Wash thoroughly with soap and water.
Inhalation	Remove from exposure. Get medical attention if experiencing effects of overexposure.
Ingestion	Get immediate medical attention.

Notes to Physician

Lead and its inorganic compounds are neurotoxins which may produce peripheral neuropathy. For an overview of the effects of lead exposure, consult Occupational Safety and Health Administration, Appendix A of Occupational Exposure to Lead (29CFR1910.1025). Tin and its inorganic compounds are primary chemical irritants of the skin, and stannic oxide has been shown to cause benign pneumoconiosis. Calcium and strontium compounds should be considered toxic only when they contain toxic substances. Calcium oxide and strontium oxide can be irritating to the skin, eyes and mucous membranes. Inhalation of copper dust has caused, in animals, hemolysis of the red blood cells, deposition of hemofusin in the liver and pancreas, and injury to the lung cells. Copper is not normally toxic when ingested orally in amounts expected from occupational exposure. Exposure to copper dust, vapor or fumes may cause metal fume fever. Aluminum powder causes pneumoconiosis in humans when inhaled as a very fine powder in massive concentrations.

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V FIRE AND EXPLOSION DATA

Flash Point (Test Method)	Not Applicable	Auto-ignition Temperature	Not Applicable
Flammable Limits in Air (% By Vol)	Not Applicable	Upper	Not Applicable
Extinguishing Media	Dry chemical or carbon dioxide should be used on surrounding fire. Do not use water on fires where molten metal is present.		
Special Fire Fighting Procedures	Use full body protective clothing and self contained breathing apparatus operated in a positive pressure mode.		
Unusual Fire and Explosion Hazard	Molten metal produce fumes, vapor and dust that may be toxic and/or respiratory irritants. The products of the metal can react vigorously with strong oxidizing agents.		

VI REACTIVITY DATA

Conditions Contributing To Instability	Not Applicable
Incompatibility	Strong oxidizers and this product may release hydrogen gas.
Hazardous Decomposition Products	High temperatures may produce toxic fumes, vapor and/or dust.
Conditions Contributing to Hazardous Polymerization	Not Applicable

VII SPILL OR LEAK PROCEDURES

Steps To Be Taken If Material is Released or Spilled
 Dust material should be vacuumed, or wet swept where vacuuming is not feasible. Particulate matter should be stored in dry containers for later disposal. Do not use compressed air for dry sweeping as a means of cleaning.

Neutralizing Chemicals	Not Applicable
Waste Disposal Method	Dispose of toxic substances and hazardous wastes in accordance with local, state and federal regulations.

VIII SPECIAL PROTECTION INFORMATION

Ventilation Requirements
 Ventilation, as described in the Industrial Ventilation Manual produced by the American Conference of Governmental Industrial Hygienists, shall be provided in those areas where exposures are above the permissible exposure limits or threshold limit values specified in OSHA or other local, state and federal regulations.

SPECIFIC PERSONAL PROTECTION EQUIPMENT
Respiratory
 As specified by 29CFR 1910.1025 Subpart (F) of the Federal Occupational Safety and Health Administration Standard for Occupational Exposure to Lead. Other local and state regulations may also apply.

Eye Face shield or vented goggles should be used around molten metal.
Glove Gloves should be worn when handling the product is necessary.

Other Clothing and Equipment
 Coveralls, or other full body clothing, shall be worn during production and properly laundered after use, with the wash water disposed of, in accordance with local, state and federal regulations. Hard hat, safety boots and other safety equipment should be worn as appropriate for the industrial environment. Personal clothing and shoes should be protected from contamination with this product.

IX SPECIAL PRECAUTIONS

PRECAUTIONARY STATEMENTS

- There are two major means of heavy metal absorption; namely, inhalation and ingestion. Most inhalation problems can be prevented with adequate use of aforementioned ventilation and respirator information. Always exercise normal, good personal hygiene prior to smoking or eating. Smoking and eating should be confined to non-contaminated areas.
- Work clothes and equipment should remain in designated lead contaminated areas, and never taken home or laundered with personal clothing. Launder contaminated clothing before reuse.
- Wash hands, face, neck and arms thoroughly before eating or smoking.
- The product is intended for industrial use only, and should be isolated from children and their environment.

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OTHER HANDLING AND STORAGE REQUIREMENTS

- Store in dry area where accidental contact with acids is not possible.
- Avoid skin contact.
- Adhere to all personal protection equipment procedures when handling, and ventilation requirements when heavy metal exposures are above permissible exposure limits or threshold limit values.
- Before Using This Product Be Familiar With The Information Contained In:
 The Federal Standard for Occupational Exposure to Lead (29CFR 1910.1025): Published in the Federal Register on Tuesday, November 14, 1978, by the Occupational Safety and Health Administration.

PREPARED BY: TEXAS LEAD & SUPPLY CO., INC

ADDRESS: P.O. Box 10901, 5800 Central Express, Houston, TX 77018

Mallinckrodt Material Safety Data

Emergency Phone Number: 314-982-5000

Mallinckrodt provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. Individuals receiving this information must exercise their independent judgment in determining its appropriateness for a particular purpose.

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Mallinckrodt, Inc., Science Products Division, P.O. Box M, Paris, KY 40361.

NITRIC ACID, 70%

PRODUCT IDENTIFICATION:

Synonyms: Aqua Fortis; Azotic Acid; Nitric Acid 70%

Formula CAS No.: 7697-37-2

Molecular Weight: 63.00

Chemical Formula: HNO_3

Hazardous Ingredients: Nitric acid

PRECAUTIONARY MEASURES

DANGER: STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. INHALATION MAY CAUSE LUNG DAMAGE.

Do not get in eyes, on skin, or on clothing.

Avoid breathing mist.

Use only with adequate ventilation.

Wash thoroughly after handling.

Keep from contact with clothing and other combustible materials.

Do not store near combustible materials.

Store in a tightly closed container.

Remove and wash contaminated clothing promptly.

This substance is classified as a POISON under the Federal Caustic Poison Act.

EMERGENCY/FIRST AID

In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. If swallowed, DO NOT INDUCE VOMITING!

Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases call a physician.

SEE SECTION 5.

DOT Hazard Class: Oxidizer

SECTION 1 Physical Data

Appearance: Clear, colorless to slightly yellow liquid.

Odor: Suffocating acrid.

Solubility: Infinite in water.

Boiling Point: 122°C (252°F)

Melting Point: -34°C (-29°F)

Specific Gravity: 1.41

Vapor Density (Air=1): 2-3 approximately

Vapor Pressure (mm Hg): 62 @ 20°C (68°F)

Evaporation Rate: No information found.

SECTION 2 Fire and Explosion Information

Fire:

Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Can react with metals to release flammable hydrogen gas.

Explosion:

Reacts explosively with combustible organic or readily oxidizable materials such as: alcohols, turpentine, charcoal, organic refuse, metal powder, hydrogen sulfide, etc.

Fire Extinguishing Media:

If involved in a fire, use water spray.

Special Information:

Increases the flammability of combustible, organic and readily oxidizable materials. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

SECTION 3 Reactivity Data

Stability:

Stable under ordinary conditions of use and storage. Containers may burst when heated.

Hazardous Decomposition Products:

When heated to decomposition, emits toxic nitrogen oxides fumes and hydrogen nitrate. Will react with water or steam to produce heat and toxic and corrosive fumes.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

A dangerously powerful oxidizing agent, concentrated nitric acid is incompatible with most substances, especially strong bases, metallic powders, carbides, hydrogen sulfide, turpentine, and combustible organics.

SECTION 4 Leak/Spill Disposal Information

Isolate or enclose the area of the leak or spill. Clean-up personnel should wear protective clothing and respiratory equipment suitable for toxic or corrosive fluids or vapors.

Small Spills: Flush with water and neutralize with alkaline material (soda ash, lime, etc.). Sewer with excess water.

Larger spills and lot sizes: Neutralize with alkaline material, pick up with absorbent material (sand, earth, vermiculite) and dispose in a RCRA-approved waste facility or sewer; the neutralized slurry with excess water if local ordinances allow. Provide forced ventilation to dissipate fumes.

Reportable Quantity (RQ)(CWA/CERCLA): 1000 lbs.

Ensure compliance with local, state and federal regulations.

NFPA Ratings: Health: 3 Flammability: 0 Reactivity: 0 Other: Oxidizer

Effer

06-89 Supersedes 10-21-86

NITRIC ACID, 70%

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PHONE No. : Jun. 29 1994 12:59PM P01

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From :

PHONE No. : :
Jun. 29 1994 1:02PM P02

Mallinckrodt Material Safety Data

Emergency Phone Number: 314-982-5000

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SECTION 5 Health Hazard Information

A. EXPOSURE / HEALTH EFFECTS

Inhalation:

Corrosive! Inhalation of vapors can cause breathing difficulties and lead to pneumonia and pulmonary edema, which may be fatal. Other symptoms may include coughing, choking, and irritation of the nose, throat, and respiratory tract.

Ingestion:

Corrosive! Swallowing citric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract.

Skin Contact:

Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and stain skin a yellow or yellow-brown color.

Eye Contact:

Corrosive! Vapors are irritating and may cause damage to the eyes. Splashes may cause severe burns and permanent eye damage.

Chronic Exposure:

Long-term exposure to concentrated vapors may cause erosion of teeth. Long term exposures seldom occur due to the corrosive properties of the acid.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye disease may be more susceptible to the effects of this substance.

B. FIRST AID

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:

DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Exposure:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Eye Exposure:

Wash eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

C. TOXICITY DATA (RTECS, 1986)

Inhalation (Rat) LC50: 244 ppm
(NO₂)/30M

SECTION 6 Occupational Control Measures

Airborne Exposure Limits:

-OSHA Permissible Exposure Limit (PEL):
2 ppm (TWA), 4 ppm (STEL)
-ACGIH Threshold Limit Value (TLV):
2 ppm (TWA); 4 ppm (STEL)

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

Personal Respirators: (NIOSH Approved)

If the TLV is exceeded, wear a supplied air, full-facepiece respirator, airline hood, or self-contained breathing apparatus. Nitric acid is an oxidizer and should not come in contact with cartridges and canisters that contain oxidizable materials, such as activated charcoal.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

SECTION 7 Storage and Special Information

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect from physical damage and direct sunlight. Isolate from incompatible substances. Protect from moisture.

NITRA

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Mallinckrodt Material Safety Data

Emergency Phone Number: 314-982-5000

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Mallinckrodt, Inc., Science Products Division, P.O. Box M, Paris, KY 40361.

Addendum to Material Safety Data Sheet

REGULATORY STATUS

This Addendum Must Not Be

Detached from the MSDS

Identifies SARA 313 substance(s)

Any copying or redistribution of the MSDS

must include a copy of this addendum

(Chem.Key: NITRA)

Product or Components
of Product:

NITRIC ACID, 70% (7697-37-2)

Hazard Categories for SARA
Section 311/312 Reporting

Acute	Chronic	Fire	Pressure	Reactive
X	X			X

SARA EHS Sect. 302 RQ (lbs.)	TPQ (lbs.)	SARA Section 313 Chemicals Name List	Chemical Category	CERCLA Sec. 103 RQ (lbs.)	RCRA Sec. 261.33
1000	1,000	Yes	No	1000	No

SARA Section 302 EHS RQ: Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.

SARA Section 302 EHS TPQ: Threshold Planning Quantity of Extremely Hazardous Substance. An asterisk (*) following a Threshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity = 10,000 lbs.

SARA Section 313 Chemicals: Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.

CERCLA Sec. 103: Comprehensive Environmental Response, Compensation and Liability Act (Superfund). Releases to air, land or water of these hazardous substances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center, (800-424-8802); Listed at 40 CFR 302.4

RCRA: Resource Conservation and Reclamation Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33

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PHONE No. :

Jun. 29 1994 1:05PM P03



Mallinckrodt
Mallinckrodt Inc.
100116

Mallinckrodt Inc.
Science Products Division
P.O. Box 8
Paris, Kentucky 40361

Emergency Telephone Number
316-987-5000

Effective Date: 09-21-85

IDENTIFICATION:

Synonyms: Aqua Regia, Azotic Acid, Nitric Acid 70%

Formula CAS No.: 7697-37-2

Molecular Weight: 63.00

Hazardous Ingredients:
Mix Application

Chemical Formula: HNO₃

PRECAUTIONS - HAZARDS

AVOID CONTACT WITH OTHER MATERIALS. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE.
CAUSES SEVERE BURNS. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED.

Do not get in eyes, on skin, or on clothing.
Avoid breathing acid.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep from contact with oxidizing and other combustible materials.
Do not store near combustible materials.
Store in a tightly closed container.
Wash and wash contaminated clothing promptly.
This substance is classified as a POISON under the Federal Caustic Poison Act.

FIRST AID MEASURES

In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases call a physician.
SEE SECTION 2.

See Hazard Class. Indicator

Physical Data

SECTION 1

Appearance: Clear, colorless to slightly yellow liquid.

Odor: Suffocating acid.

Solubility: Infinite in water.

Boiling Point: 220°C (292°F)

Vapor Density (Air=1): 2.1 approximately

Melting Point: -16°C (7°F)

Vapor Pressure (mm Hg): 67 @ 20°C (68°F)

Specific Gravity: 1.4

Evaporation Rate: No Information Found

Fire and Explosion Information

SECTION 2

Fire:

Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Can react with metals to release flammable hydrogen gas.

Explosion:

Reacts explosively with combustible organic or readily oxidizable materials such as: alcohols, turpentine, charcoal, organic refuse, metal powder, hydrogen sulfide, etc.

Fire Extinguishing Media:

If involved in a fire, use water spray.

Special Information:

Increases the flammability of combustible, organic and readily oxidizable materials. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

Reactivity Data

SECTION 3

Stability:

Stable under ordinary conditions of use and storage. Containers may burst when heated.

Hazardous Decomposition Products:

When heated to decomposition, emits toxic nitrogen oxide fumes and hydrogen nitrate. Will react with water or steam to produce heat and toxic and corrosive fumes.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

A dangerously powerful oxidizing agent, concentrated nitric acid is incompatible with most substances, especially strong bases, metallic powders, carbides, hydrogen sulfide, turpentine, and combustible organics.

Leak/Spill/Disposal Information

SECTION 4

Isolate or enclose the area of the leak or spill. Clean-up personnel should wear protective clothing and respiratory equipment suitable for toxic or corrosive fluids or vapors.

Small Spills: Flush with water and neutralize with alkaline material (soda ash, lime, etc.). Sewer with excess water.

Large spills and inc. sizes: Neutralize with alkaline material, pick up with absorbent material (sawdust, earth, vermiculite) and dispose in a RCRA-approved waste facility or sewer the neutralized slurry with excess water if local ordinances allow. Provide forced ventilation to dissipate fumes.

Reportable Quantity (RQ) (RCRA/CEMCLA): 1000 lbs

Ensure compliance with local, state and federal regulations.

000119

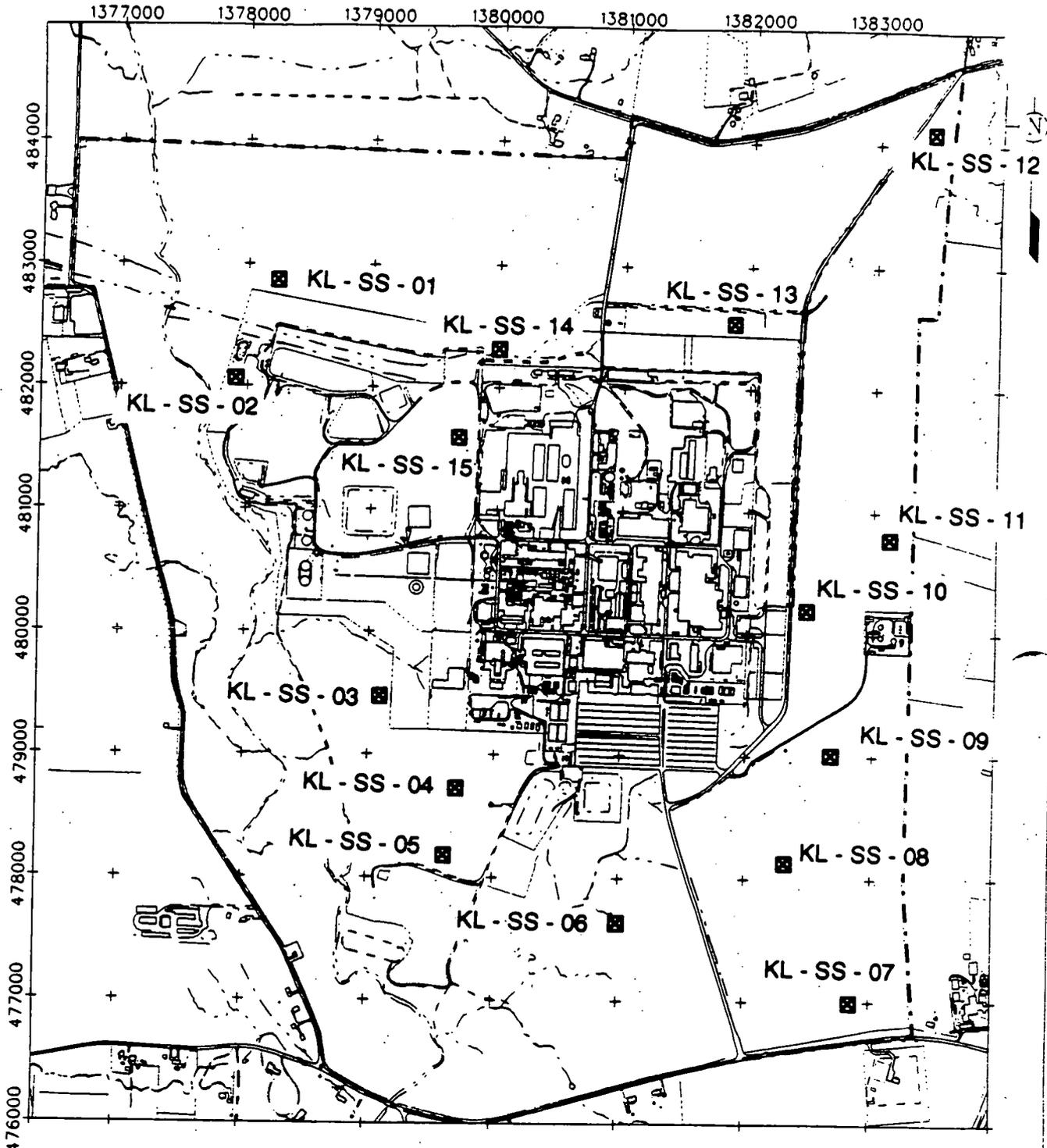
10176

5830

ATTACHMENT F
WORK AREA MAP

000120

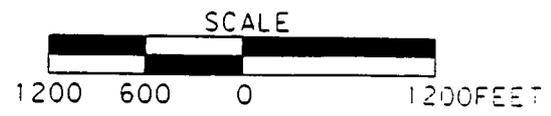
000121



LEGEND:

- SOIL SAMPLING LOCATION
- - - FEMP BOUNDARY

000121



OF RED: /USR/ERMA/CRUS/BMP/ADBELLS.DGN

K₁ SOIL SAMPLING LOCATIONS

ATTACHMENT G
OSHA AND DOE EMPLOYEE RIGHTS POSTER

Occupational Safety and Health Protection for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities

Policy:

U.S. Department of Energy (DOE) contractor employees shall be provided with safe and healthful working conditions in accordance with the standards prescribed pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, and the Department of Energy Organization Act of 1977; said standards shall be consistent with those promulgated under the Occupational Safety and Health Act of 1970, Public Law 91-596. Please refer to the Order DOE 5483.1A for details.

DOE Contractors:

DOE has determined that

is subject to DOE Acquisition Regulation (DEAR), Subpart 970.23, and is, therefore, required to comply with applicable DOE-prescribed Occupational Safety and Health Administration (OSHA) standards listed therein. This Order and the standards are available for employee review at

SAFETY & HEALTH BUILDING #53

As delineated by the Order DOE 5483.1A, the DOE contractor is required to:

1. Furnish to employees, employment and a place of employment which are as free from occupational safety and health hazards as possible.

2. Establish and implement programs and procedures to comply with the Order DOE 5483.1A. These shall include programs and procedures to monitor the workplace for known toxic materials and harmful physical agents which are used or produced at the facility, and maintain records of the data. As part of these programs and procedures:

(a) Advise employees or their representatives that they are to be provided with an opportunity to (1) observe monitoring or measuring for toxic materials or harmful physical agents, and (2) have access to the results thereof.

(b) Provide to each employee, former employee, or designated representative, within 15 days of the receipt of a written request, access to or copies of any monitoring or bioassay records relevant to the employee's potential exposure to toxic materials or harmful physical agents during employment.

(c) Notify employees promptly of any information indicating that an exposure to toxic materials or harmful physical agents may have exceeded the limits specified by the DOE prescribed OSHA standards.

(d) Provide to each employee, former employee, or designated representative, within 15 days of the receipt of a written request, access to or copies of the employee's cumulative recorded occupational radiation dose during employment.

(e) Notify employees promptly of any information indicating that a radiation dose may have exceeded the limits specified by the DOE prescribed OSHA standards.

*For purposes of access to an employee's monitoring, bioassay, or radiation exposure records, if the representative is not the recognized/certified collective bargaining agent, then he or she must have the employee's written authorization for such access.

Employees:

All employees are required to:

1. Observe the DOE prescribed OSHA standards applicable to their work.
2. Report promptly to the contractor any condition which may lead to a violation of these standards.
3. Respond to warning signals which may be activated in the event of fire, radiation, or other possible emergencies.
4. Report emergencies using established procedures.

Inspections:

All activities under this contract are subject to inspection by DOE. When an inspection under the Order DOE 5483.1A is conducted, a contractor management representative and a representative authorized by the employees will be given an opportunity to accompany the DOE inspector.

Where there is no representative authorized by the employees, the DOE inspector will consult with a reasonable number of employees concerning safety and health conditions in the workplace.

Complaints:

Employees may file a complaint with the contractor management or with the local DOE office using the form DOE F 5480.4 to request an inspection of the workplace. Complaints also may be filed by letter, telegram, or oral means. DOE F 5480.4 is available from

NEAR THE SOUTH ENTRANCE OF THE CAFETERIA

When an employee requests anonymity from the contractor, DOE shall honor this request.

Imminent Danger

For any condition or practice which presents an immediate hazard that could reasonably be expected to cause death or serious physical harm (permanent or prolonged impairment of the body or temporary disablement requiring hospitalization), the contractor and/or DOE shall take immediate and effective remedial actions to remove employees from the hazard and/or eliminate the hazard. As soon as possible, an inspection shall be conducted by the contractor and/or DOE to assure that appropriate actions have been taken to preclude recurrence of the hazard.

Nondiscrimination:

No contractor shall discharge or in any manner discriminate against any employee by virtue of the filing of a complaint, or in any other fashion exercising on behalf of himself or herself or others any action set forth in the Order DOE 5483.1A.

Inquiries:

Inquiries should be addressed to the contractor; however, additional inquiries may be addressed to the following local DOE official:

J. Phil Harnic

Fernald Office
U. S. Department of Energy
P. O. Box 398705
Cincinnati, Ohio 45239-8705

Posting Requirements:

Copies of this notice must be posted in a sufficient number of places in Government-owned plants and facilities operated by DOE contractors subject to DOE Acquisition Regulation (DEAR), Subpart 970.23, to permit employees working in or frequenting any portion of the plant to observe a copy on the way to or from their workplace.



U.S. Department of Energy

ATTACHMENT H
ACKNOWLEDGEMENT FORM

0837

ATTACHMENT I
EXCAVATION AND TRENCHING PERMIT

000127



EXCAVATION AND TRENCHING PERMIT
(OSHA Section 1926.900)

DATE _____	TIME _____	DATE EXPIRES _____
JOB DESCRIPTION AND LOCATION (Be Specific)		

BEFORE TRENCHING AND EXCAVATION

<input type="checkbox"/> SOIL CLASSIFICATION <input type="checkbox"/> STABLE <input type="checkbox"/> TYPE A <input type="checkbox"/> TYPE B <input type="checkbox"/> TYPE C ROCK <input type="checkbox"/> REQUIREMENTS HAVE BEEN MET AND REQUIRED DATA DOCUMENTED. <input type="checkbox"/> PROXIMITY TO UTILITIES, BUILDINGS, FOOTINGS OR PILES AND SOURCES OF VIBRATION. <input type="checkbox"/> OWNERS OF UTILITIES, SERVICE OR TRANSMISSION PIPES, ETC. (Gas, Water, Telephone, Sewer)	<input type="checkbox"/> CHECK FOR PREVIOUSLY DISTURBED GROUND. <input type="checkbox"/> ADEQUACY AND AVAILABILITY OF ALL EQUIPMENT, INCLUDING PERSONAL PROTECTIVE GEAR, SHIELDING MATERIAL, SIGNS, BARRICADES AND MACHINERY. <input type="checkbox"/> OTHER KNOWN OBSTRUCTIONS (e.g., Piling, concrete caissons, etc.). <input type="checkbox"/> ALLOWABLE SLOPE.
---	---

COMMENTS

BEFORE TRENCHING AND EXCAVATION

<input type="checkbox"/> SIZE OF EXCAVATION DEPTH _____ WIDTH _____ LENGTH _____ <input type="checkbox"/> CHANGING GROUND CONDITIONS, PARTICULARLY AFTER RAIN FALL. <input type="checkbox"/> MONITOR FOR POSSIBLE OXYGEN DEFICIENCY OR GAS-LESS CONDITIONS. <input type="checkbox"/> ADEQUACY OF SHIELDING AND/OR SLOPING AS WORK PROGRESSES. <input type="checkbox"/> ENTRANCE AND EXIT FACILITIES <input type="checkbox"/> STAIRWAY <input type="checkbox"/> LADDERS <input type="checkbox"/> RAMP <input type="checkbox"/> CHANGE IN VEHICULAR AND MACHINERY OPERATION PATTERNS <input type="checkbox"/> WATER REMOVAL EQUIPMENT AND OPERATION	<input type="checkbox"/> PROTECTIVE SYSTEMS DEPTH OF A TRENCH OR EXCAVATION OF 5 FEET OR MORE. CHECK THE APPLICABLE OSHA APPROX. BELOW: <input type="checkbox"/> S - Shoring and Shoring <input type="checkbox"/> C - Timber Shoring for Trenches <input type="checkbox"/> D - Aluminum Hydraulic Shoring for Trenching <input type="checkbox"/> E - Alternatives to Timber Shoring <input type="checkbox"/> F - Selection of Protective Systems <input type="checkbox"/> RPE - Designed Shoring (this must be filed on file) NOTE: SLOPING OR SHIELDING FOR EXCAVATIONS GREATER THAN 20 FEET DEEP SHALL BE DESIGNED BY A STATE REGISTERED PROFESSIONAL ENGINEER. <input type="checkbox"/> ADEQUACY OF PORTABLE TRENCH BOXES OR TRENCH SHIELDS.
---	--

COMMENTS

SIGNATURES AND DATES

COMPETENT PERSON	CIVIL ENGINEER	CIVIL SUPERINTENDENT
ELECTRICAL	SUPERVISOR	EQUIPMENT FOREMAN
EQUIPMENT OPERATOR	MECHANICAL SUPERVISOR	OTHER APPROVAL, IF REQUIRED BY CIVIL ENGINEER OR STATE REGISTERED PROFESSIONAL ENGINEER

ATTACHMENT J
FEMP WORK PERMIT

000129

**FERMCO
WORK PERMIT**

WORK PERMIT NUMBER

SECTION A - BACKGROUND INFORMATION (Completed by Supervisor-in-Charge)

NRMC NUMBER	JOB START DATE	ESTIMATED COMPLETION DATE
CONSTRUCTION WORK ORDER NUMBER	COMPANY	TRACT LOCATION
EXACT DESCRIPTION OF WORK		
SUPERVISOR-IN-CHARGE NAME	BADGE NUMBER	PHONE/RADIO NUMBER
PROJECT ENGINEER/CONSTRUCTION COORDINATOR	BADGE NUMBER	PHONE/RADIO NUMBER

SECTION B - TYPES OF PERMITS REQUIRED (Completed by Supervisor in Charge)

<input type="checkbox"/> OUTAGE	<input type="checkbox"/> PENETRATION
<input type="checkbox"/> ASBESTOS (posted)	<input type="checkbox"/> CHEM/HAZ MATERIAL (posted)
<input type="checkbox"/> CONFINED SPACE (posted)	<input type="checkbox"/> OPEN FLAME/WELDING (posted)
<input type="checkbox"/> HAZARDOUS WORK (posted)	<input type="checkbox"/> RADIATION (posted)

SECTION C (CONTINUED)

EGRESS/FALL PROTECTION	REQ'D.	DRA
32. Ladder	<input type="checkbox"/>	<input type="checkbox"/>
33. Scaffolds/Railings	<input type="checkbox"/>	<input type="checkbox"/>
34. High Lift Platform	<input type="checkbox"/>	<input type="checkbox"/>
35. Safety Belt	<input type="checkbox"/>	<input type="checkbox"/>
36. Safety Harness	<input type="checkbox"/>	<input type="checkbox"/>
37. Safety Line	<input type="checkbox"/>	<input type="checkbox"/>
38. Tripod/Retrieval System	<input type="checkbox"/>	<input type="checkbox"/>
39.		
40.		

SECTION C - GENERAL PRECAUTIONS (Completed by Supervisor-in-Charge)

PRELIMINARY	REQ'D.	DRA
1. Check for Utilities	<input type="checkbox"/>	<input type="checkbox"/>
2. Health & Safety Plan	<input type="checkbox"/>	<input type="checkbox"/>
3. Work Plan	<input type="checkbox"/>	<input type="checkbox"/>
4. Working surface safe for load (especially roof work)	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>
ENERGY CONTROL (Lock & Tag)		
6. Electrical	<input type="checkbox"/>	<input type="checkbox"/>
7. Chemical	<input type="checkbox"/>	<input type="checkbox"/>
8. Mechanical	<input type="checkbox"/>	<input type="checkbox"/>
9. Other (Steam, etc.)	<input type="checkbox"/>	<input type="checkbox"/>
10. Specific Equipment Plan Required	<input type="checkbox"/>	<input type="checkbox"/>
11.	<input type="checkbox"/>	<input type="checkbox"/>
ACCIDENT PREVENTION		
12. Fire Extinguisher	<input type="checkbox"/>	<input type="checkbox"/>
13. Safety Shower Operable & Less Than 100 Ft. Away	<input type="checkbox"/>	<input type="checkbox"/>
14. Eye Wash Operable & Less than 100 Ft. Away	<input type="checkbox"/>	<input type="checkbox"/>
15. Spill Protection	<input type="checkbox"/>	<input type="checkbox"/>
16. Communications	<input type="checkbox"/>	<input type="checkbox"/>
17. Magnetic Survey for Buried Utilities/Objects	<input type="checkbox"/>	<input type="checkbox"/>
18.	<input type="checkbox"/>	<input type="checkbox"/>
19.	<input type="checkbox"/>	<input type="checkbox"/>
AREA ISOLATION		
20. Area Barricades	<input type="checkbox"/>	<input type="checkbox"/>
21. Signs (PPE)	<input type="checkbox"/>	<input type="checkbox"/>
22. Signs (Warning)	<input type="checkbox"/>	<input type="checkbox"/>
23.	<input type="checkbox"/>	<input type="checkbox"/>
24.	<input type="checkbox"/>	<input type="checkbox"/>
OTHER CONTROLS		
25. Exhaust Ventilation	<input type="checkbox"/>	<input type="checkbox"/>
26. Supplied Air Ventilation	<input type="checkbox"/>	<input type="checkbox"/>
27. GFCI	<input type="checkbox"/>	<input type="checkbox"/>
28. Screen/Shield	<input type="checkbox"/>	<input type="checkbox"/>
29. Non-Sparking Tools	<input type="checkbox"/>	<input type="checkbox"/>
30. Intrinsically Safe Equipment	<input type="checkbox"/>	<input type="checkbox"/>
31.	<input type="checkbox"/>	<input type="checkbox"/>

SECTION D1 - TASK/AREA/LOCATION (If PPE requirements depend on these)

1.
2.
3.
4.

SECTION D2 - PPE REQUIRED (Completed by OS&H)

HEAD PROTECTION	<input type="checkbox"/> None	___ Hard Hat	___ Face Shield	___ Glasses
		___ Goggles	___ Welding Goggles	
GLOVES	<input type="checkbox"/> None	___ Cotton	___ Leather Palm	___ Rubber
		___ Nitrile	___ Vinyl	___ Neoprene
		___ Vinyl Liner	___ Other:	
PROTECTIVE CLOTHING	<input type="checkbox"/> None	___ Level A	___ Paper	___ Acid Splash Suit
		___ Level B	___ Tyvek	___ Fire Retardant
		___ Level C	___ Saranex	___ Shoe Covers
		___ Level D	___ Other:	
RESPIRATOR	<input type="checkbox"/> None	___ Full Face	___ Belt-Mounted Half Mask	___ Hooded Air Line
		___ Half Mask	___ Air Line w/Escape	___ SCBA
		___ PAPR	___ Air Line w/Dual Flow	
CARTRIDGE	<input type="checkbox"/> None	___ HEPA	___ Organic/HEPA Comb	___ Acid Gas
		___ MF Canister	___ Organic Vapor	___ Mercury
		___ Ammonia		
OTHER	<input type="checkbox"/> None	___ Ear Plugs	___ Cool Vest	___ Steel-Toe Boots
		___ Ear Muffs		

SUPERVISOR-IN-CHARGE SIGNATURE:	BADGE NUMBER:	DATE:
TEAM SIGNATURE:	BADGE NUMBER:	DATE:

WORK TASK REVIEWED, APPROVAL TO PERFORM WORK

FACILITY OWNER'S SIGNATURE:	BADGE NUMBER:	DATE:
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IN CASE OF EMERGENCY: CALL "CONTROL" BY RADIO, PHONE 6511, OR USE NEAREST FIRE ALARM BOX.

PERMIT TERMINATION (WORK COMPLETED/JOB CONDITIONS HAVE CHANGED)

SUPERVISOR-IN-CHARGE SIGNATURE:	DATE:
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NO.	DISTRIBUTION OF COPIES
1	Post at Job (OS&H Copy)
2	Supervisor in Charge
3	OS&H Field Copy

0882

ATTACHMENT K

**OPEN FLAME AND WELDING
HAZARDOUS WORK PERMIT**

000131

FERMCO OPEN FLAME AND WELDING, HAZARDOUS WORK PERMIT

FERMCO WORK PERMIT NO. _____

SECTION A - BACKGROUND INFORMATION This permit is only valid when it is attached to a FERMCO Work Permit.

EMPLOYEE:	Today's Date	Time	Est. Completion Date:
	LEVEL:	COORDINATION:	PLANT JOB NO.:

SECTION B - OPEN FLAME/WELDING PERMIT			
PRECAUTIONS	YES	NO	DNF
1. Combustibles, magnesium, and urethans removed, covered or shielded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Flammable liquids removed or isolated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Wall and floor openings covered or protected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Flame retardant tarp suspended underneath work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Combustible gas check.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Combustibles removed from opposite sides. (work on walls or ceilings)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Fire watch will remain posted during breaks and for 30 minutes after work is completed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Fire watch has an extinguisher and knows how to activate the nearest alarm.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Fire & Safety Inspector shall be present during the burning operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Fire & Safety Inspector shall be present to monitor when the system is initially opened.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COMBUSTIBLE GAS TEST RESULTS _____ %LEL			
EQUIPMENT/AREA CHECKED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. SPECIAL INSTRUCTIONS/PRECAUTIONS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. MSDS REVIEWED (10)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FERMCO WORK PERMIT "C" Name _____ checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applicable PPE in use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Signature - "Fire Watch has required training"	Date:		
SI Signature	Date:		
FW Signature	Date:		
Permit Issue Date:	Time:		
Permit Expiration Date:	Time:		

NO.	DISTRIBUTION COPIES
1	POST AT JOB
2	SUPERVISOR-IN-CHARGE
3	IND. HYGIENE/IND. SAFETY
4	EMPLOYEE REP.

SECTION C - HAZARDOUS WORK			
	YES	NO	DNF
Excavations (proceed to hole)			
1. Shored or Sloped to 34 degrees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Maximum vertical step 24 inches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
"Competent person" authorizing excavation to "T" or "F" above			
3. Ladder(s) in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Atmospheric Tests Required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Erected Work (greater than 6 feet)			
1. Railings, toeboards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Solid footing under scaffold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Ladders tied off	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Erected Work			
1. Nominal voltage _____			
2. Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crane Work			
1. PM Data O.K.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Electric lines deenergized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FERMCO WORK PERMIT "C" Name _____ checked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applicable PPE in use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FW Signature	Date:		
Permit Issue Date:	Time:		
Permit Expiration Date:	Time:		

SECTION D - SIGNATURES (employees assigned to job)		
I HAVE READ AND UNDERSTAND ALL REQUIREMENTS OF THIS PERMIT.		
Employee Signature:	Date:	Time:
1.		
2.		
3.		
4.		
5.		
6.		
WORK AUTHORIZATION REVIEWED AND FOUND ACCEPTABLE FOR USE		
Supervisor Signature:	Date:	Time:

IN CASE OF EMERGENCY, CALL "CONTROL" BY RADIO, PHONE 6511, OR USE NEAREST FIRE ALARM BOX.

2830

ATTACHMENT L
TRENCH INSPECTION LOG

000133

DAILY & PRIOR TO WORK TRENCH INSPECTION LOG

K₁ SOIL SAMPLING AND ANALYSIS PROJECT

EXACT LOCATION _____ DATE _____

SAMPLE NUMBER _____ Work Crew Leader _____

1. Measurements of trench:
 - Depth _____ (not more than 42")
 - Length _____
 - Width _____ (30" min for footing)
2. Soils will be class "C" soils- YES or NO
3. Water Conditions- WET DAMP DRY
Any standing water in trench- YES or NO
4. Confined Space permit completed (required) YES or NO
5. Are the "GENERAL WORK PERMIT" and "OPEN FLAME, WELDING, AND HAZARDOUS WORK PERMIT" complete and posted- YES or NO
6. Excavated material (soil) stored two (2) feet from trench edge
YES or NO
7. Any hazards noted with trench- YES or NO
If so, corrected- YES or NO
8. Safe access to trench- YES or NO
9. Is trench safe to access and work in- YES or NO
10. Any unattended trench properly barricaded- YES or NO
11. Competent Person has the authority to stop work and remove personnel from trench during this project if any hazard is found- YES or NO

COMMENTS: _____

Signed by COMPETENT PERSON

DATE & TIME

000135

ATTACHMENT M
SUBCONTRACTOR HEALTH AND SAFETY
REQUIREMENTS

000135

**PART 8 - ENVIRONMENTAL,
HEALTH AND SAFETY AND TRAINING
REQUIREMENTS**

5830

PART TITLE

- A. General Site Requirements
- B. Training
- C. Attachment 1 - Subcontract Training and Medical Schedule and Locations

**ES&H AND TRAINING
Model Subcontract**

PREFACE

This ES&H and Training Subcontract Model is issued to guide the creation of Construction Subcontract Part 8. The section should be tailored to the specific requirements of each subcontract.

**PART 8 - ENVIRONMENTAL,
HEALTH AND SAFETY AND TRAINING
REQUIREMENTS**

A. GENERAL SITE REQUIREMENTS

1. Subcontractor's attention is called to General Provision, Article "Safety" and "Accident Prevention". All work on this project shall be performed in accordance with the Environmental, Safety and Health (ES&H) requirements of the U.S. Department of Energy (DOE) Order DOE5480.4. "Environmental, Protection, Safety and Health Protection Standards," and Order DOE5480.9, "Construction Safety and Health Program," OSHA (29CFR 1926 and applicable portions of 29CFR 1910), state and local regulations and FERMCO ESH-1-1000. DOE Orders and FERMCO ESH-1-1000 requirements are delineated in these subcontract documents.
2. Subcontractors attention is called to the Project Specific Health and Safety Plan which shall be read, understood and signed by the subcontractor and accepted for use on this subcontract. Subcontractor employees shall be oriented on the plan and use of the Health and Safety Requirements Matrix and sign an acknowledgement sheet signifying that they understand the requirements.
3. FERMCO will supply the following Personal Protective Equipment:
 - Steel toed leather safety shoes
 - Coveralls, underwear, and socks
 - Winter coats
 - Sweat pants and shirts
 - Dosimeter badge
 - Air line respirators and/or self-contained breathing apparatus
 - Latex Rubber Shoe Covers
4. Inspection of Tools and Equipment prior to site access.
 - 4.1 The subcontractor shall notify the FERMCO Construction Coordinator at least two (2) working days prior to bringing tools and equipment including fuel storage tanks (See Special Conditions - Notification of Fuel Storage Tanks) on site.
 - 4.2 When OSHA requires equipment inspection by a competent person, the certification of inspection must accompany the equipment.
 - 4.3 Equipment and tools will be subject to inspection by FERMCO upon arrival at the site. Inspection shall include but not be limited to the following: OSHA compliance, damage that could render the item inoperable, oil, hydraulic or other fluid leaks. Tools or equipment may be radiologically checked if there is a possibility they were used on other radiologically contaminated sites.
 - 4.4 The equipment operating manual must be on site with the equipment.

5. Hazardous Material Reporting

Within 20 calendar days after award, the subcontractor shall submit a list of all hazardous material to be brought on-site including the quantity to be brought on-site and the quantity to be used. Material Safety Data Sheets (MSDS) copies shall also be attached. This list shall be kept current throughout the project. Material in excess of project requirements shall not be brought on site.

6. Bioassay - Radiation Worker II Trained Personnel

6.1 The form titled "Required Urinalysis Sampling" (Attachment 3) shall be completed and submitted to FERMCO by 10:00 a.m. on the fifteenth (or closest working day) of each month for the preceding work period. This form shall be completed for the subcontractor and its lower-tier subcontractors. Required information shall be reported for all workers qualified under FERMCO Radiation II Training that have worked at the Project site during the reporting period.

6.2 All personnel qualified under FERMCO Radiation Worker II Training are required to leave a Bioassay after every sixty (60) day period in which the individual has performed work in a contamination zone and at the end of work on the subcontract. The information submitted above will allow FERMCO to generate Bioassay cards for all personnel reported. Bioassay cards will be provided to the prime subcontractor for distribution to all affected employees. Employees who will be leaving the job prior to the next sampling date are required to leave a sample just before final departure.

6.3 All workers receiving a Bioassay card will be required to report to the Bioassay station in the ES&H Building (Bldg. 53) by the date shown on the card. Failure to report to the Bioassay station within the required time period may result in the employee's badge being withheld until the requirement is fulfilled

6.4 It is the subcontractor's responsibility to confirm that it has received Bioassay cards for all affected employees. Missing cards must be reported immediately to the FERMCO construction representative responsible for the subcontract.

7. Emergency Communications

7.1 A means to communicate any emergency condition must be available at all times during any work activity. This may be one of the following:

On-site work: Site telephone or cellular phone.
2-way radio on FEMP channel.
Site manual fire alarm pull station (when within 200 feet on the same elevation).

Off-site work: Public telephone or cellular phone.

7.2 Cellular phones, if required, will be furnished by the subcontractor. Associated charges will be the responsibility of the subcontractor.

7.3 A two-way radio Motorola MTX Series Model B7 shall be furnished by the subcontractor for this subcontract. The subcontractor is responsible for programming per FERMCO specifications by Mobilcomm, Cincinnati, Ohio (phone 742-5555). The radio will be turned over to FERMCO at completion of the subcontract.

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7.4 To report emergencies on site by phone, dial 6511 or by radio, switch to Channel 7 and call CONTROL. When off-site, call 911.

8. Required Safety Meetings

8.1 Prior to starting work on the project, each subcontract employee shall attend a pre-work safety meeting presented by FERMCO to review the Project Specific Health and Safety Plan.

8.2 The subcontractor and lower tier subcontractors shall hold a weekly tool box safety meeting to emphasize safety and to discuss a safety topic related to the project. To supplement the subcontractor's safety topics, FERMCO will provide safety bulletin's and safety videos for use in those meetings. A record of attendance and topics covered shall be maintained by the subcontractor.

9. Required Medical Monitoring

In accordance with 29 CFR 1910.120, Occupational Safety and Health Standards, all personnel assigned to a FEMP project and performing actual tasks are required to participate in the FERMCO medical surveillance and biologic monitoring program.

If an outside medical resource is utilized to provide any portion of the surveillance and monitoring program, the subcontractor must receive prior written authorization from the FERMCO Medical Director who shall have final authority for approval of external medical surveillance and biologic monitoring programs. Medical Services will provide minimum requirements protocols for prospective subcontractors. Medical documentation showing that personnel meet minimum requirements shall be submitted to FERMCO for approval by FERMCO Medical Services at least eight (8) working days prior to performing work.

Subcontractor employees will be required to undergo entry, exit, and other medical surveillance examinations or biologic monitoring as indicated in the Health and Safety Matrix. Subcontractors shall make employees available for such examinations.

- Pre-assignment (baseline)
- Annual (within one year of previous physical)
- After incidents, potential exposures, or physician recommendation
- Exit (termination)

All individuals required to wear respiratory protection must be medically approved, trained and quantitatively fit tested (QNFT). Qualitative fit testing (QLFT) is not acceptable. FERMCO will conduct the medical review, the training, the respirator fit test and issue a respirator fit test card. FERMCO will accept documentation authorizing use of respiratory protection from other external organizations provided that proper documentation is provided to the respirator program administrator at least eight (8) working days in advance and meets FERMCO requirements. (See Part 8, Section C, Respirator Program)

Special medical (health hazard) surveillance or biologic monitoring requirements as prescribed by 29CFR 1926, Safety and Health Standards for Construction and/or 29CFR1910.120 (Standards for Hazardous Waste Operations), other Federal, State or local statutes; or specific site Health and Safety Plans, may be fulfilled by sources outside of FERMCO (e.g., lead and associated tests). Documentation including copies of medical examinations, laboratory or other testing including biologic monitoring shall be provided to FERMCO Medical Services. Biologic monitoring requirements will be based upon the Health and Safety Requirement Matrix. Additional surveillance or monitoring requirements may be generated from the subcontractor's method of performing work or materials used.

Costs for subcontractor personnel and for medical services performed by an outside medical resource will be borne by the subcontractor.

Subcontractor employees receiving medical treatment with radiopharmaceuticals will be restricted from entering Controlled Areas until such time as the radiopharmaceutical has cleared sufficiently from his/her system to the point where frisking through a Personal Contamination Monitor (PCM) at the control point does not trigger the alarms. Subcontractor employees that are to receive such treatment should report to Medical before hand so the appropriate precautions can be taken. Employees that have received treatment with radiopharmaceuticals shall report to Medical immediately upon returning to work.

Subcontractor employees that are pregnant should report to FERMCO Medical. The employee will be informed of risks related to her pregnancy as a result of working on the subcontract. The employee may "Declare Pregnancy" in accordance with 10CFR835. If declared FERMCO will ensure that the employee's thermoluminescent dosimeter (TLD) is read monthly (as opposed to quarterly). FERMCO's administration control limit is 50 mrem/month or 400 mr/gestation period.

10. Natural Occurrence Issue (Weather)

Weather affected work will be stopped if lightning, heavy persistent rain, or other adverse weather conditions are in the area. This includes any weather conditions whose impact is judged to be detrimental to safety by FERMCO. Cost of work stoppage for adverse weather conditions shall be borne by the subcontractor.

11. Confined Space Program

Anytime subcontractor personnel are required to enter permit-required confined spaces at the FEMP, the subcontractor shall observe the requirements of FERMCO's Permit-Required Confined Space Program. FERMCO's confined space program complies with the requirements of OSHA 29 CFR 1910.146. Prior to any entry into a confined space at the FEMP site, the subcontractor shall ensure that the following criteria are satisfied:

- All confined spaces at the FEMP are classified as permit-required confined spaces until evaluated by FERMCO Occupational Safety and Health (OS&H).
- The confined space shall be evaluated by FERMCO OS&H to determine whether any hazards are present in the space.
- When no hazards are present in the confined space, a Confined Space Evaluation Form will be completed by FERMCO OS&H stating that the space is a non-permit confined space for the work activity and work may progress with minimal requirements.

- If evaluation of the confined space indicates a hazard(s) is present in the space, the space will be classified as a permit-required confined space and a Confined Space Entry Permit will be issued by FERMCO OS&H.
- Prior to any entry into a permit space, efforts shall be made to remove the identified hazard(s) from the space. If the hazard(s) cannot be removed from the space, certain steps/criteria specified in 1910.146 are required (i.e., continuous/periodic monitoring of the atmosphere, attendant/standby personnel, entry supervisor, fall protection/retrieval equipment, confined space rescue plan, confined space training).
- For work performed on the FEMP site, the FERMCO Emergency Response Team is trained/qualified to conduct confined space rescue services. For work performed off the FEMP site, the subcontractor shall make arrangements with local fire departments or other qualified sources to establish confined space rescue services and provide their rescue plan to FERMCO for Approval.
- Subcontractor personnel required to enter into permit spaces, act as standby/attendant personnel, and to act as entry supervisors shall attend Permit Required Confined Spaces: Entrant/Attendant Training (FERMCO training course #1408, approximate 8 hour length) offered by FERMCO or alternate confined space training which meets the training requirements of 1910.146. Documentation of training provided by alternate confined space training providers shall be submitted to FERMCO for Industrial Hygiene approval.

12. Reporting Injuries and Accidents

- 12.1 All injuries and illnesses, no matter how minor, resulting from work performed at the FEMP shall be reported to the FERMCO Medical facility when they occur. The employees supervisor shall accompany the employee.
- 12.2 The subcontractor's superintendent shall report all accident and injuries to the Construction Contracts Manager when they occur.
- 12.3 The subcontractor shall provide reports and support investigations into accidents, illnesses, and injuries as required by FERMCO.

13. Back-up Alarms

All self-propelled construction equipment and vehicles shall be equipped with an automatic electronic audible reverse signal alarm.

14. Roll over Protection Exemption

Exemptions to roll over protection permitted by OSHA are not permitted.

15. Eye Protection

All eye protection shall comply with ANSI Z87.1 Practice for Occupational and Educational Eye and Face Protection. Rigid side shields are required with safety glasses. Safety glasses are a minimum requirement for entrance to the controlled area of the site and for all construction areas.

16. Counterweight Swing Radius

The counterweight swing radius of all cranes, backhoes, elevating work platforms, and other similar equipment shall be barricaded so as to prevent personnel entry inside the swing radius.

17. Portable Fire Extinguishers

Subcontractors shall provide FM Approved or UL Listed portable fire extinguisher(s) for all work, storage and trailer locations. (OSHA 1926 Subpart F) Ordinary hazard areas shall require a 2A-20BC rated extinguisher within 50 feet of all work task area(s). NFPA 10 shall be followed for all fire extinguisher requirements.

18. Anti-Contamination Clothing (Anti-Cs)

Disposable Anti-Cs shall be supplied by the subcontractor and shall have material thickness and strength, seam strength and impermeability to protect wearers from contamination. Specific Anti-C requirements are defined in the Health and Safety Requirements Matrix. The following are acceptable suppliers: HAZCO, Dayton, Ohio; Norvell, Alexandria, TN; Foster, Columbus, Ohio; Euclid, Kent, Ohio. Samples and data from other proposed suppliers must be submitted to FERMCO for approval at least two (2) weeks prior to use. Disposable anti-Cs cannot be reused.

Anti Cs shall consist of:

- Disposable Coveralls
- Disposable Hoods
- Disposable Shoe Covers
- Latex Rubber Shoe Covers (by FERMCO)
- Duct Tape
- Latex Gloves
- Cotton Gloves

Coverall, hood, and shoe cover material shall be Saranex for wet conditions and Tyvex or Saranex for dry conditions.

(NOTE: Matrix should spell this out for each task since it could vary. If matrix covers can delete all but first paragraph.)

19. Equipment Operator Qualifications

Before an operator uses equipment on site, the subcontractor shall furnish the Construction Contracts Manager with a certification stating that the operator has been qualified to operate the equipment to be operated on site at least two (2) working days before starting work. Acceptable certifications can be from the equipment manufacturer, a certified trainer, or the Operating Engineers Union.

20. Radiological Sources

Radiological sources may only be brought on site with prior approval of the FERMCO Manager of Radiological Compliance and notification of the Radiological Dosimetry Source Custodian (information to include the type and activity of the source, its intended purpose, how long the source is expected to remain on site, and what controls will be placed on the sources to ensure their stability while on site).

Part 8 - ES&H
Subcontractor ES&H Program

B. TRAINING

- 1.0 Refer to the Health and Safety Requirements matrix, Section B, for project specific training requirements.
- 1.1 The subcontractor is responsible for all cost (wages, fringes, etc.) of their personnel being trained. (Reference: Project Labor Agreement Article III, Section 3-3 which provides that the GCBCTC will bear the cost of site worker and Radiation II training; Refresher training shall be at the subcontractor's cost.)
- 1.2 The cost of trainers provided by FERMCO will be borne by FERMCO.
- 1.3 Certifications of training by a subcontractor trainer must be submitted to FERMCO for each employee. The submittal shall be made at least four (4) working days before site access is needed.
- 1.4 The subcontractor's superintendent is responsible for submitting Access Request, and Profile Survey Questionnaire Forms to the Construction Contracts Manager with a copy to Construction Document Control two (2) working days prior to bringing personnel on-site .
- 1.5 The subcontractor's superintendent is responsible for submitting a Supervised Field Experience form, signifying completion of Hazardous Waste Site Supervised Field Experience 29CFR1910.120, for each employee when Site Worker Training is required, to the Construction Contracts Manager with a copy to Construction Document Control.
- 1.6 The Subcontract Training and Medical Schedule and Locations (Attachment 2) gives durations, provider, schedule and location information for training courses and physicals.
- 1.7 Personnel required to take Radiation Worker II training are also required to complete Respirator Training.
- 1.8 Personnel with current Radiation Worker II training are not required to take Radiation I training.
- 1.9 Personnel who have current 40 Hour 29CFR1910.120 Training must take Construction Rules and Regulations, General Employee Training (G.E.T.), and Radiation Worker I Training or Radiation Workers II Training as required.
- 1.10 Personnel who may perform minor or non-routine work with asbestos containing materials (ACM) such as drilling holes in floor tile or transite, or similar tasks involving potential asbestos exposure or enter into areas controlled for potential asbestos exposure shall receive appropriate awareness training provided by FERMCO. Respirator Training and Asbestos Fit Testing will also be provided by FERMCO.

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PART C: ATTACHMENT 1

SUBCONTRACT TRAINING AND MEDICAL SCHEDULE & LOCATIONS

TRAINING REQUIREMENT	DURATION HOURS	PROVIDED BY	TIMES PROVIDED	LOCATION PROVIDED
CONST. RULES/REG.	2	FERMCO	M-TH 8:00 AM M-TH 12:30 AM	FEMP FEMP
GENERAL EMPLOYEE (G.E.T) ANNUAL	4	FERMCO	MON 11:30 PM WED 11:30 PM	PLANTATION PLANTATION
SITE WORKER	12	FERMCO	TUES 7:30 AM & WED 7:30 AM	PLANTATION
ACCESS ANNUAL REFRESHER	4	FERMCO	SCHEDULED	PLANTATION
RADIATION I (RAD I)	8	FERMCO	THUR 7:30 AM	PLANTATION
RAD I REFRESHER (EVERY 2 YEARS)	8	FERMCO	THUR 7:30 AM	PLANTATION
RADIATION II (RADII)	24	FERMCO	THUR - MON 7:30 AM	PLANTATION
RAD II REFRESHER (EVERY 2 YEARS)	24	FERMCO	THUR - MON 7:30 AM	PLANTATION 7:30 AM
RESPIRATOR	4	FERMCO	TUES & WED * 7:00 AM & 11:00 AM	PLANTATION
RESPIRATOR ANNUAL REFRESHER	4	FERMCO	TUES & WED * 7:00 AM & 11:00 AM	PLANTATION
RESPIRATOR FIT	1	FERMCO	SCHEDULED	FEMP
RESPIRATOR FIT ANNUAL REFRESHER	1	FERMCO	SCHEDULED	FEMP
RESPIRATOR FIT ASBESTOS AND LEAD	2	FERMCO (BY SUBCONTRACTOR FOR ASB WORKER)	SCHEDULED	FEMP
RESPIRATOR FIT ASBESTOS REFRESHER (6 MONTH)	2	FERMCO (BY SUBCONTRACTOR FOR ASB WORKER)	SCHEDULED	FEMP

* OTHER TIMES MAY BE SCHEDULED DEPENDING ON AVAILABILITY

PART C: ATTACHMENT 1 (cont.)

SUBCONTRACT TRAINING AND MEDICAL SCHEDULE & LOCATIONS

TRAINING REQUIREMENT	DURATION HOURS	PROVIDED BY	TIMES PROVIDED	LOCATION PROVIDED
PHYSICALS (2 PARTS) TOTAL	3	FERMCO OR SUBCONTRACTOR	TUES 6:30 AM *	FEMP
PHYSICAL - ANNUAL REFRESHER (2 PARTS)	3	FERMCO OR SUBCONTRACTOR	TUES 6:30 AM *	FEMP
29CFR 1910-120 SUPERVISOR	8	FERMCO	SCHEDULED	PLANTATION
29CFR 1910-120 FIELD SUPERVISION	8 (RAD I) 24 (RAD II)	SUBCONTRACTOR		AT WORK SITE
ASBESTOS AWARENESS & ANNUAL REFRESHER	1 1	FERMCO FERMCO	SCHEDULED SCHEDULED	FEMP FEMP
ASBESTOS ABATEMENT WORKER	24	SUBCONTRACTOR		
ASBESTOS ABATEMENT WORKER REFRESHER	8	SUBCONTRACTOR		
ASBESTOS ABATEMENT PRACTICES - CONTRACTOR / SUPERVISOR	32	SUBCONTRACTOR		
ASBESTOS ABATEMENT PRACTICES - CONTRACTOR / SUPERVISOR REFRESHER	8	SUBCONTRACTOR		
ASBESTOS ABATEMENT PRACTICES - OTHER AS REQUIRED BY THE CONTRACT	VARIES	SUBCONTRACT		
ENERGY CONTROL (LOCK AND TAG)	4	FERMCO	SCHEDULED	FEMP
ENERGY CONTROL REFRESHER (ANNUAL)	4	FERMCO	SCHEDULED	FEMP
K-65 SILO/RTS ACCESS	3	FERMCO	SCHEDULED	FEMP

* OTHER TIMES MAY BE SCHEDULED DEPENDING ON AVAILABILITY

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APPENDIX G

DISPOSITION OF INVESTIGATION-DERIVED WASTES

	ENVIRONMENTAL DIVISION	PROC NO: EP-SMS-013
	ENVIRONMENTAL PROTECTION ENVIRONMENTAL MONITORING & SURVEILLANCE SITE MEDIA SAMPLING	EFFECTIVE DATE:
TITLE: Disposition of Investigation-Derived Wastes		REVISION NO: 0
		PAGE 1 OF 12
APPROVAL: _____ DATE: _____		AUTHOR: G. Henderson
Michael F. Ramirez, Manager, Site Media Sampling		

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SUMMARY LOG

Revision Number	Description of Revision	Pages Affected
0	Initial Implementation	All

Disposition of Investigative Derived Wastes

PROC NO: EP-SMS-013

REV NO: 0

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1.0 PURPOSE

This procedure establishes field methods for disposition of investigative derived wastes (IDW) for Fernald Environmental Restoration Management Corporation (FERMCO), Environmental Programs (ENV) Division, Environmental Monitoring & Surveillance (EMS), Site Media Sampling (SMS).

2.0 SCOPE

This procedure applies to Site Media Sampling Technicians who are extracting samples according to a Task-Specific Sample and Analysis Plan (TSAP).

3.0 REFERENCES**3.1 Source Documents**

3.1.1 Site-Wide CERCLA Quality Assurance Project Plan (SCQ)

3.1.2 SSOP-0002, Initiating Waste Characterization Activities Using the Material Evaluation Form (MEF).

3.1.3 SSOP-0035, Accumulating Hazardous Waste in Satellite Accumulation Areas and Interim Containers

3.1.4 SOP 20-C-625, Evaluating Low Level Radioactive Waste (LLRW) Bulk Waste Streams for Shipment.

3.1.5 SSOP-0044, Management of Soil, Debris, and Waste from a Project.

3.1.6 SSOP-0008, Preparing and Transferring Uncharacterized Waste to the Controlled Holding Area.

3.2 Interface Documents

3.2.1 Project Work Package (PWP) which includes the TSAP

3.2.2 EP-SMS-001, Field Logbook

3.2.3 EP-SMS-003, Equipment Decontamination

3.2.4 EP-SMS-004, Conduct and Coordination of Field Operations

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4.0 DEFINITIONS

- 4.1 **Investigation-Derived Waste (IDW)** - Wastes generated in the performance of Site Media Sampling activities. These wastes include, but are not limited to: disposable extraction tools; disposable Personal Protective Equipment (PPE) such as Tyvek coveralls, gloves or booties; excess environmental media materials such as soil; decontamination solutions/rinsates.
- 4.2 **VOC-Contaminated Waste** - Waste materials, primarily liquid, containing Volatile Organic Compounds (VOCs).
- 4.3 **Contact Waste** - Any non-decontaminable (disposable) tools, equipment, and PPE which directly contacts media being sampled and/or associated potentially contaminated surfaces and substances.
- 4.4 **Task-Specific Sampling and Analysis Plan (TSAP)** - The document which specifies sampling methods, locations, amounts, preservatives, quality control, and documentation for a specific sampling effort. The TSAP incorporates requirements of the Site-Wide CERCLA Quality Assurance Project Plan (SCQ).
- 4.5 **Project Work Package (PWP)** - Document packet used in the field containing, but not limited to, the following:
 - A. Task-Specific Health and Safety Plan (H&SP)
 - B. Task-Specific Sampling and Analysis Plan (TSAP)
 - C. Permits
 - D. Interface documents
- 4.6 **Work Zone** - An area of limited access established at a sampling site with barriers, signs, tape, and permits to control entry by non-authorized personnel.

5.0 RESPONSIBILITIES

5.1 Lead Technician

- 5.1.1 Ensures required waste containers and associated equipment are available at the sampling location.
- 5.1.2 Oversees waste collection and packaging activities.
- 5.1.3 Ensures documentation is completed.

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5.2 Site Media Sampling (SMS) Technician

5.2.1 Packages and disposes of IDW according to this procedure.

5.2.2 Completes appropriate field documents.

6.0 PROCEDURE**6.1 General Requirements****Lead Technician**

6.1.1 Verify work zone is prepared according to EP-SMS-004, Conduct and Coordination of Field Operations.

6.1.2 Verify waste containers are present at work the zone according to SSOP-0035, Accumulating Hazardous Waste in Satellite Accumulation Areas and Interim Containers.

6.2 Disposition of Contact Wastes

6.2.1 Following the completion of task-specific assignments, the SMS sampling team shall place all initial contact waste into supplied polyethylene bags used for disposal of radiologically contaminated materials.

NOTE

Do not remove personal protective equipment prior to containing initial contact wastes.

6.2.2 Transport the bagged initial contact wastes to the entrance to the exclusion zone buffer area.

6.2.3 At the exclusion zone buffer area, remove remaining PPE and respiratory equipment as per Radiological Worker training.

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NOTE

Respirator cartridges shall be removed from used respirators and shall be considered as IDW contact waste.

- 6.2.4 Seal the polyethylene bag containing all contact wastes using plastic tape, and place into a second polyethylene bag. As with the first bag, seal the second polyethylene bag using plastic tape.
- 6.2.5 All radiological contact waste shall remain at the control point and will be dispositioned by Radiological Control as low level radiological waste.
- 6.2.6 If the task-specific assignment has included the sampling of waste which is a listed RCRA Hazardous Waste, proceed as in 6.2.2 through 6.2.5, but also implement the following:
- A. Examine all contact wastes. If there is no visible contamination on PPE or the initial contact waste, dispose of the waste as low-level radiological waste as in Steps 6.2.2 through 6.2.5.
 - B. If there are visible signs of contamination, dispose of stained material in a separate polyethylene bag as in Steps 6.2.2 through 6.2.5, except deposit the bag in a 55-gallon drum designated for the disposition of low-level mixed waste. This drum shall remain at the exclusion zone but shall be dispositioned as follows:
 - 1. Obtain a W-65 card from the Material Control and Accountability (MC&A) clerk in Plant 1 and complete the applicable information.
 - 2. Obtain a Material Evaluation Form (MEF) or an MEF Verification Form from Waste Characterization, complete the appropriate information, and submit to Waste Characterization.
 - 3. After completion of the W-65 card and the applicable MEF, contact Logistics Administration & Inventory Control & Warehousing (LA&IC&W) to transport the drum to an appropriate storage area.
 - 4. The SMS sampling team lead shall obtain copies of the W-65 card and the applicable MEF, and assign copies to the SMS Task-Specific Sampling and Analysis Plan (TSAP) and to a bound log for W-65 cards and SMS-generated MEFs. (see Sample Coordination Unit - SCU)

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5. For SMS tracking and accountability purposes, complete the SMS Waste Disposition Log. (see SCU)

6.3 Disposition of Decontamination Solution

- 6.3.1 Following the completion of task specific assignments, the SMS sampling team shall decant all decontamination solutions into a 5-gallon container placed within the diked decontamination area, which is in the exclusion area.
- 6.3.2 Remove the 5-gallon container of liquid IDW to the buffer zone and monitor the container out of the exclusion zone.
- 6.3.3 Transport the 5-gallon container of liquid IDW to Building 3G.
- 6.3.4 Decant the liquid IDW from the 5-gallon container into a 55-gallon drum designated for task-specific IDW decontamination solution.
- 6.3.5 Complete the assigned IDW log with date, project name, sample plan number, and approximate amount of liquid IDW added to the 55-gallon drum.
- 6.3.6 Continue additions in this manner until the designated 55-gallon IDW Decontamination Solution drum has been filled, listing all applicable projects onto the IDW log.
- 6.3.7 When the 55-gallon drum has been filled and the IDW log completed, obtain an MEF from Waste Characterization.
- 6.3.8 Complete the MEF and submit to Waste Characterization.
- 6.3.9 If the IDW meets criteria for verification to MEF #2493, by Waste Characterization concurrence, the 55-gallon drum of liquid IDW may be dispositioned through the General Sump.
 - A. Contact the Plant 8 MC&A clerk to obtain a W-65 card.
 - B. Complete all pertinent information on the W-65 card and copy the card to all of the task-specific project files and to the SMS MEF/W-65 log.
- 6.3.10 If the IDW does not meet the criteria for verification to MEF #2493, or if a RCRA Hazardous Waste was sampled, Waste Characterization will not grant permission for disposal through the General Sump, and the following applies:
 - A. Contact the Plant 8 MC&A clerk to obtain a W-65 card.

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- B. Complete all pertinent information on the W-65 card and send the completed card to the Plant 1 MC&A clerk.
 - C. Contact Logistics Administration & Inventory Control & Warehousing (LA&IC&W) for transportation to the appropriate storage area until disposition through the Plant 8 VOC treatment system.
- 6.3.11 If the task-specific assignment has included the sampling of waste which is a listed RCRA hazardous waste, or if methanol was used in decontamination, proceed as in Steps 6.3.1 through 6.3.8, but implement the following:
- A. Obtain an MEF Verification Form from Waste Characterization, complete the appropriate information, and submit to Waste Characterization.
 - B. After completion of the W-65 card and the applicable MEF, contact Logistics Administration & Inventory Control & Warehousing (LA&IC&W) for transportation to the appropriate storage area.
- 6.3.12 When the liquid IDW contains a one or a mixture of .02 Normal solution hydrochloric or sulfuric acid, or dilute sample preservatives, proceed as in Steps 6.3.2 through 6.3.8.
- 6.3.13 Until a final FEMP IDW Policy is approved by OEPA, do not proceed to disposition any aqueous IDW containing RCRA listed waste. Any aqueous IDW containing either a RCRA listed waste or any VOC with a concentration greater than 100 ppb will be managed through the Plant 8 VOC treatment system.
- 6.3.14 Contact the FEMP RCRA warehouse facility owner and have Logistics Administration & Inventory Control & Warehousing (LA&IC&W) deliver the filled drum of VOC-contaminated or listed waste for storage, characterization, and future disposition.

7.0 RECORDS

7.1 Field Logbook

7.4 PWP and TSAP

8.0 ATTACHMENTS

8.1 Attachment A - Card 65-1 (W-65 Card), Item Production/Certification/Identification.

8.2 Attachment B - Material Evaluation Form

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ATTACHMENT A
W-65 CARD

CARD 65-1 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION										INV. NO.: 	
P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE			SHIFT	BADGE NO.	CONT. NO.	SERIAL NO.
					MO	DAY	YEAR				
SEAL NUMBER	SEAL DATE			PACKAGE PHYSICAL CERTIFICATION			PLANT	PROD. MBA	REF NO.		
	MONTH	DAY	YEAR	YES NO							
WASTE DESCRIPTION AND COMMENTS				EMPTY CONTAINER AT START			DCAR	SURV. NO.	GROSS WEIGHT		
				RUST HOLES OR DENTS							
PACKAGE TYPE				MATERIAL IS AS CODED			TARE WEIGHT				
				PROHIBITED MATERIALS							
PACKAGE SIZE				LIQUIDS IN CONTAINER			NET WEIGHT				
				MINIMUM OF VOID SPACE							
PROJECT				PACKAGE SECURED							
				DRAIN PLUG SECURED							
				OVERPACK							
				REPACK							

GENERATOR SIGNATURE
PS-F-1945-1 (REV. 11/20/82)

SUPERVISOR SIGNATURE DATE

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ATTACHMENT B
MATERIAL EVALUATION FORM

Forsyth Environmental Management Project
MATERIAL EVALUATION FORM (MEF)

Requestor Section

page 1 of 2

A. REQUESTOR/WASTE STREAM IDENTIFICATION			
1. MEF#: _____ Original: _____ Revised: _____	2. Date Submitted: _____	3. Material Type and Source Code:	
4. Requestor Name: _____	5. Phone No.: _____	6. Badge No./Co. Name: _____	
B. GENERATION INFORMATION			
1. Provide best descriptive name for material:	2. Does this material originate in a ESWMU or SWMU? Unit Number: _____	3. Project, Activity, or Work Area generating waste (include CED # if applicable):	
4. Date of last or expected generation: <input type="checkbox"/> existing <input type="checkbox"/> new _____	5. Generation Quantity:	6. Generation Frequency:	7. Similar waste stream MEF# for MTCORC:
8. Provide a detailed description of what the material is:			
9. Provide a detailed description of how and where deposits within the waste stream would be generated, including any units which manage the material:			
<small>(Note: Generator must attach all supporting documentation containing steps 8 and 9.)</small> <input type="checkbox"/> additional enclosure <input type="checkbox"/> SDP:			
<input type="checkbox"/> MSDS: <input type="checkbox"/> AEDD Log entries: <input type="checkbox"/> release report: <input type="checkbox"/> manufacturing spec: <input type="checkbox"/> Other: _____			

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ATTACHMENT B cont)

Instructions to Generators for Completing the Material Evaluation Form (MEF), Requester Section

The Waste Characterization Section is responsible for providing characterization for all wastes generated by FEMF personnel activities. However, it is the generator's responsibility to ensure that his/her waste is properly characterized as an process birth.

The Material Evaluation Form (MEF) is the document by which generator identify material which requires characterization and on which the Waste Characterization group summarizes the results of the characterization effort. The MEF does not determine specific waste as classified at the site secondary stream, but refers only to the characteristics of a particular waste stream (identified by MEF #). Specific unreacted material is assigned to a generator using the MEF Numbered Request Form and Inventory Identification Attachment.

The following documents have been developed to assist in the completion of the generator's portion of the MEF. Each block of the form must be completed for MEF to be accepted. Use of "None" or "N/A" is acceptable when appropriate. Checkboxes must show a "C" request attached documentation. Upon completion of this form submit to Waste Characterization at MS # 46. (Note MEFs will not be accepted with incomplete information or lacking documentation e.g. MSDS, release report, etc)

PART A: GENERATOR WASTE STREAM IDENTIFICATION

1. MEF #: Enter number of the form as received from Waste Characterization (25153). Check whether this material is original or a duplicate to an existing MEF as appropriate.
2. Date Submitted: Enter the date the form is submitted to Waste Characterization.
3. Lot Marking Code: Enter first the Material Type then the Source Code assigned to the waste if this information is known. Contact Material Control and Accountability (MCRAL, 2473), for assistance in determining this information. Enter "Unknown" if applicable.
4. Generator Name: Provide First Name, Last Name and Middle Initial.
- 5.4. Badge No./Co. Name/Phone No: Self Explanatory

PART B: GENERATION INFORMATION

1. Name: Provide the best descriptive name for the material (e.g. spent acetone, dust collector residue, and bagging, purge water etc.)
2. HWMHS: If the material originates from a Hazardous Waste Management Unit please provide unit name and A. If you are unsure please consult your supervisor, Waste Characterization or equivalent CHD representative for assistance.
3. Self-explanatory.
4. Self-explanatory. Always provide at least an estimate. If the waste is "leakbugger" or has otherwise already been generated, provide the material date of generation as an exact date. This information may readily be obtained from existing records or from MCAA. "Unknown" is not acceptable.
5. Generation Quantity: Enter the amount and unit of waste to be generated (e.g. 50 gal). This is generally the amount of waste in a container (or a multiple thereof). If the generation event is continuous only, enter the time amount of waste.
6. Quantity/Frequency: Enter a date period (week, year etc.) during which the amount specified in item 5 will be generated, or "variable" as appropriate.
7. Similar waste streams: Enter MEF # or Material Type/Source Code for a similar waste stream if known. Otherwise "N/A".
8. Description: Provide a clear concise description of what the waste stream actually is (e.g., residue from dust collector cleaning). Include all components of the waste stream and any relevant information concerning packaging, containers etc. Be as detailed as possible. **DO NOT REPEAT THE DESCRIPTION CORRESPONDING TO THE MATERIAL TYPE CODE.**
9. Description of Generation: Provide a detailed description of how the waste stream is/will be generated. Include specific process involved, history of waste etc. For commercial waste include packaging information (e.g. independent, packed with chemical materials). Check and include all relevant supporting documentation (e.g. MSDS, SOP, Manufacturing Specifications, Release Reports etc.).

PART C: PHYSICAL CHARACTERISTICS

1. Color/Appearance: Be as detailed as space will allow. What does the waste look like?
2. Phase: Check all that are present in the waste.
3. Free Liquids: If yes, state a "total on" amount.
4. Odor: **DO NOT SMELL THE WASTE!** If the waste has a known hazardous odor, then describe the odor (e.g., acid, pungent, acetone, sweet).
5. Layers: Check appropriate box. Single layer means the waste has no distinct separation or layers (e.g., water, oil, or mud-water). 2-layered means the waste is composed of two distinct layers (e.g., water/oil or oil/water). Multilayered means more than two distinct layers (e.g., oil/water/mud-water).
6. pH: If the waste contains aqueous free liquids, list the range of pH if known. If the pH is not known mark "not known" in the blank. If a pH range is entered, check the boxes for the range. Documentation may consist of analytical data, MSDS, or pH paper results. For non-aqueous wastes enter "N/A".
7. Flash Point: If the waste contains free liquids list the range of its flash point if known. If the flash point is not known, mark "not known" in the blank. If a flash point range is entered, check the boxes for the range. Documentation may consist of analytical data or MSDS.

PART D: MATERIAL COMPOSITION

1. Composition: List all components which make up the waste stream along with the range of the approximate volume in percent or parts per million. Circle the unit (% or ppm) used for each component. Use ppm only if less than 10,000. Assume a value of 15 for any component given in ppm when calculating the "Total Material". If only partial knowledge of the composition in the waste stream is available, list those components and provide the approximate percentage of the waste which is unknown. Provide boxes for the components in this section.
2. Waste Characteristics: Check each box which applies to the waste. Circle boxes as appropriate. Do not document items "suspected" of being present in the waste. These should be noted in blank BS.
None of the above - Check this when no answer above apply.
Not Known - Check this when adequate information is not available to answer the questions above.
None - Check the appropriate box when specific items above are checked.
3. Radioactive concentrations: Indicate radioactive concentrations range of the material. If analytical data is available please attach to form. Contact ES&T for information on radioactive concentrations of materials waste. Indicate the basis for the checked box. Material Accounting information may be attached to analytical data.

APPENDIX H
PROJECT SCHEDULE

