006228

**Department of Energy**

**Ohio Field Office**
**Fernald Closure Project**
**175 Tri-County Parkway**
**Springdale, Ohio 45246**

OCT 27 2006

Mr. James A. Saric, Remedial Project Manager
United States Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

DOE-0030-07

Mr. Thomas Schneider, Project Manager
Ohio Environmental Protection Agency
Southwest District Office
401 East Fifth Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

**TRANSMITTAL OF THE DRAFT CERTIFICATION DESIGN LETTER AND CERTIFICATION PROJECT SPECIFIC PLAN FOR AREA 1, PHASE IV DECONTAMINATION FACILITY AREA, REVISION A**

Enclosed for your review is the draft Certification Design Letter and Certification Project Specific Plan for Area 1, Phase IV Decontamination Facility Area.

If you have any questions or require additional information, please contact me at (513) 648-3139.

Sincerely,

Johnny Reising

Johnny W. Reising
Director

Enclosure: As Stated

cc w/enclosure:
J. Desormeau, DOE-OH/FCP
T. Schneider, OEPA-Dayton (three copies of enclosure)
G. Jablonowski, USEPA-V, SRF-5J
M. Cullerton, Tetra Tech
M. Shupe, HSI GeoTrans
S. Helmer, ODH

cc w/o enclosure:
R. Abitz, Fluor Fernald, Inc./MS88
J. Chiou, Fluor Fernald, Inc./MS88
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C. Murphy, Fluor Fernald, Inc./MS1
T. Terry, Fluor Fernald, Inc./MS1

006228

# CERTIFICATION DESIGN LETTER AND CERTIFICATION PROJECT SPECIFIC PLAN FOR AREA 1, PHASE IV - DECONTAMINATION FACILITY AREA

**FERNALD CLOSURE PROJECT**
**FERNALD, OHIO**

**OCTOBER 2006**

**U.S. DEPARTMENT OF ENERGY**

**20730-PSP-0006**
**REVISION A**
**DRAFT**

006228

# CERTIFICATION DESIGN LETTER AND CERTIFICATION PROJECT SPECIFIC PLAN FOR AREA 1, PHASE IV - DECONTAMINATION FACILITY AREA

**Document Number 20730-PSP-0006**
**Draft Revision A**

**October 2006**

APPROVAL:

| | |
|---|---|
| Jyh-Dong Chiou, Project Manager<br>Environmental Closure Project | Date |
| Rich Abitz, Characterization Manager<br>Environmental Closure Project | Date |
| Tom Buhrlage, Sampling Manager<br>Environmental Closure Project | Date |
| Reinhard Friske, Quality Assurance/Quality Control<br>Safety, Health and Quality | Date |


**FERNALD CLOSURE PROJECT**

**Fluor Fernald, Inc.**
**P.O. Box 538704**
**Cincinnati, Ohio 45253-8704**

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## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ASCOC | area-specific constituent of concern |
| ASL | analytical support level |
| BTV | benchmark toxicity value |
| CDL | Certification Design Letter |
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act |
| COC | constituent of concern |
| CRDL | contract required detection limit |
| CU | certification unit |
| CVAA | Cold Vapor Atomic Absorption |
| DOE | U.S. Department of Energy |
| DQO | Data Quality Objective |
| EDD | electronic data deliverable |
| EPA | U.S. Environmental Protection Agency |
| FACTS | Fernald Analytical Computerized Tracking System |
| FAL | Field Activity Log |
| FCP | Fernald Closure Project |
| FRL | final remediation level |
| GC | gas chromatograph |
| GC/MS | gas chromatography/mass spectroscopy |
| GPS | Global Positioning System |
| HWMU | Hazardous Waste Management Unit |
| ICP/MS | inductively coupled plasma/mass spectroscopy |
| LSC | liquid scintillation counting |
| µg/kg | micrograms per kilogram |
| µg/L | micrograms per liter |
| MDL | minimum detectable level |
| mg/L | milligrams per liter |
| mg/kg | milligrams per kilogram |
| NAD83 | North American Datum of 1983 |
| OEPA | Ohio Environmental Protection Agency |
| OU | Operable Unit |
| PCB | polychlorinated biphenyl |
| pCi/g | picoCuries per gram |
| pCi/L | picoCuries per liter |
| PSP | Project Specific Plan |
| QA/QC | Quality Assurance/Quality Control |
| RCRA | Resource Conservation and Recovery Act |
| RI/FS | Remedial Investigation/Feasibility Study |
| ROD | Record of Decision |
| RWP | Radiological Work Permit |

## LIST OF ACRONYMS AND ABBREVIATIONS
## (Continued)

| | |
|---|---|
| SCM | Surface Contamination Monitor |
| SCQ | Sitewide CERCLA Quality Assurance Project Plan |
| SED | Sitewide Environmental Database |
| SEP | Sitewide Excavation Plan |
| SPL | Sample Processing Laboratory |
| SVOC | semi-volatile organic compound |
| TAL | Target Analyte List |
| TAT | turnaround time |
| UCL | Upper Confidence Limit |
| UST | underground storage tank |
| V/FCN | Variance/Field Change Notice |
| VOC | volatile organic compound |
| VSL | validation support level |
| WAC | waste acceptance criteria |
| WAO | Waste Acceptance Organization |

# EXECUTIVE SUMMARY

This document is a combination of the Certification Design Letter (CDL) and Certification Sampling Project Specific Plan (PSP) for Area 1, Phase IV - Decontamination Facility Area; and it describes the certification design, sampling, analysis, and validation for soil in Area 1, Phase IV - Decontamination Facility Area.

Certification demonstrates that area-specific constituents of concern (ASCOCs) meet the risk based final remediation levels. The following information is included:

- The boundary of Area 1, Phase IV - Decontamination Facility Area (Figure 1-1) and a description of the areas to be certified under the guidance of this document;
- A discussion of historical data from the area proposed for certification;
- A discussion of the ASCOC selection process and list of ASCOCs assigned to the Area 1, Phase IV - Decontamination Facility Area;
- A presentation of the certification unit (CU) boundaries and proposed sampling strategy;
- Details of certification sampling, analysis, and validation that will take place;
- The analytical requirements and the statistical methodology that will be employed; and
- The proposed schedule for the certification activities.

The scope of this certification effort is limited to the certification of Area 1, Phase IV - Decontamination Facility Area as shown on Figure 1-1. Remediation was complete in Area 1, Phase IV - Decontamination Facility Area in October 2006, thus initiating the certification process described in this document. The certification design presented in this document follows the general approach outlined in Section 3.4 of the Sitewide Excavation Plan (SEP, DOE 1998) and SEP Addendum (DOE 2001).

One CU has been defined for this certification effort. The selection of Area 1, Phase IV - Decontamination Facility Area ASCOCs was accomplished using constituent of concern lists in the Operable Unit 5 Record of Decision (DOE 1996), previous investigation data, and process knowledge. Total uranium, thorium-228, thorium-232, radium-226, and radium-228 (the sitewide primary radiological COCs) are considered ASCOCs in each CU. Secondary ASCOCs are identified within the certification area. The secondary ASCOCs from various remediation areas are also being retained for certification of this area because equipment that was decontaminated in the Decontamination Facility hauled soil and debris in those areas.

Upon completion of the certification activities described in this document as well as approval of this document by the United States and Ohio Environmental Protection Agencies, a Certification Report will be issued.

# 1.0 INTRODUCTION

This Certification Design Letter (CDL) and Certification Sampling Project Specific Plan (PSP) describes the certification design, sampling, analysis, and validation necessary to demonstrate that soil in Area 1, Phase IV - Decontamination Facility Area have met the final remediation levels (FRLs) for all area-specific constituents of concern (ASCOCs).

The format of this document follows guidelines presented in the Sitewide Excavation Plan (SEP, DOE 1998). Accordingly, this document consists of nine sections:

1.0 Introduction - Presentation of the purpose, objectives, and scope of this CDL

2.0 Historical and Soil Precertification Data, and Concrete Precertification Methodology - Discussion of historical soil data, and presentation of soil precertification data from Area 1, Phase IV - Decontamination Facility Area.

3.0 Area-Specific Constituents of Concern - Discussion of selection criteria and ASCOCs for Area 1, Phase IV - Decontamination Facility Area

4.0 Certification Approach - Presentation of design, surveying, sampling and analytical methodologies

5.0 Schedule

6.0 Quality Assurance/Quality Control Requirements - Presents the field Quality Control (QC) and analytical methodologies

7.0 Health and Safety

8.0 Disposition of Waste

9.0 Data Management

References

## 1.1 OBJECTIVES

The primary objectives of this document are to:

- Define the boundaries of the area to be certified under the guidance of this CDL/Certification PSP (Figure 1);
- Present maps for newly acquired real-time data;
- Define the ASCOC selection process and list the selected ASCOCs for Area 1, Phase IV - Decontamination Facility Area;
- Present the CU boundaries and proposed certification sampling strategy;

- Summarize the analytical requirements and the statistical methodology that will be employed; and
- Present the proposed schedule for the certification activities.

## 1.2 SCOPE AND AREA DESCRIPTION

The scope of this CDL and Certification PSP includes details of soil certification sampling, analysis, and validation that will take place in Area 1, Phase IV - Decontamination Facility Area (Figure 1). This 1.02 acre area is located southwest of the On-site Disposal Facility (cell 8), and includes the footprint of the Decontamination Facility and support trailers.

Field activities will be consistent with the Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ) and Section 3.4 of the Sitewide Excavation Plan (SEP). The certification sampling program, as discussed in Section 2.0 of this PSP, will be consistent with Data Quality Objective (DQO) SL-052, Revision 3, which is included as Appendix A of this PSP.

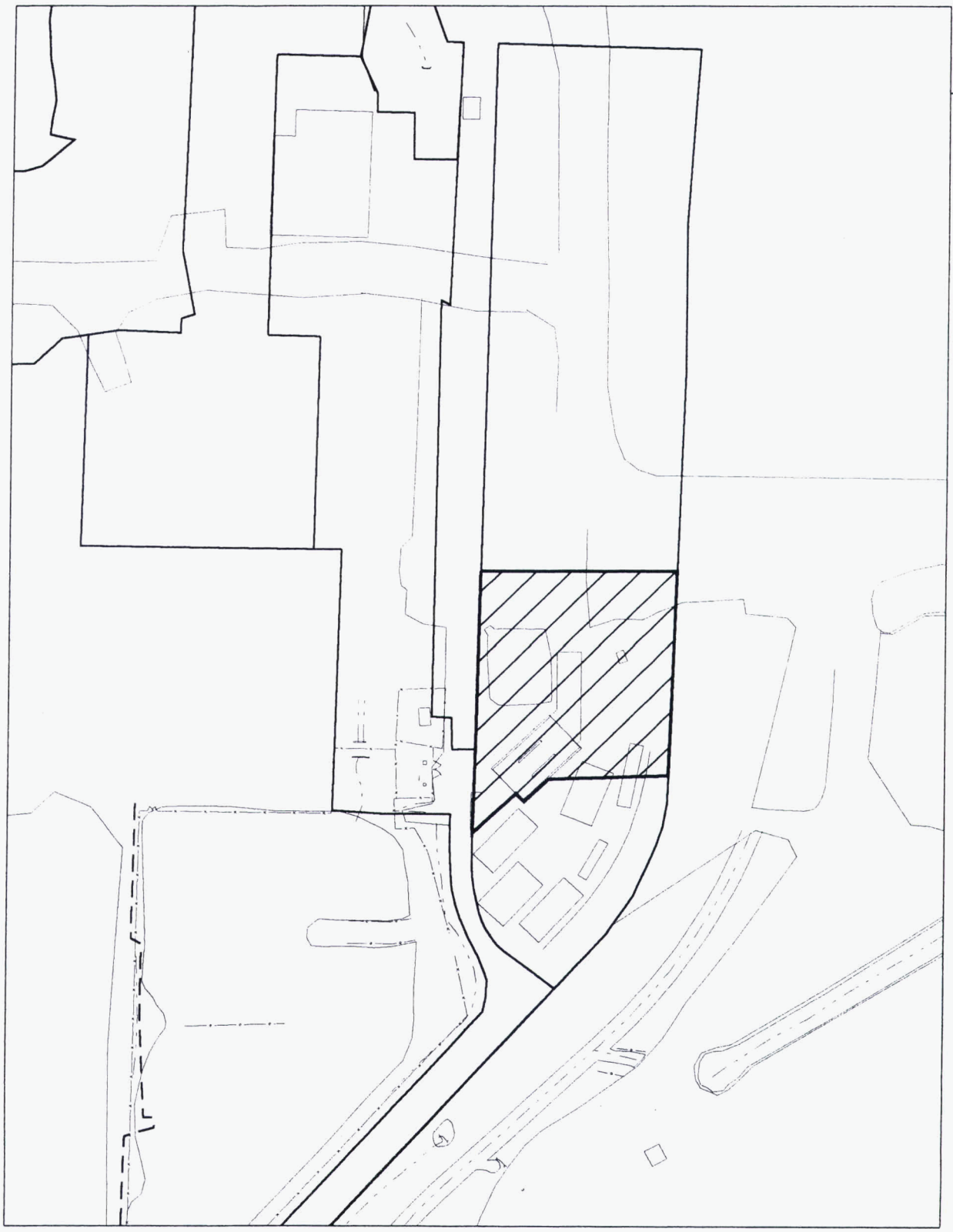
## 1.3 KEY PROJECT PERSONNEL

Key project personnel responsible for performance of the project are listed in Table 1-1.

**TABLE 1-1**
**KEY PROJECT PERSONNEL**

| Title | Primary | Alternate |
|---|---|---|
| DOE Contact | Johnny Reising | Jane Powell |
| Project Manager | Jyh-Dong Chiou | Rich Abitz |
| Characterization Manager | Rich Abitz | Greg Lupton |
| Field Sampling Manager | Tom Buhrlage | Mike Frank |
| Surveying Manager | Bernie Kienow | Andy Clinton |
| WAO Contact | Christa Walls | Pat Shanks |
| Laboratory Contact | Paul McSwigan | Amy Meyer |
| Area 1, Phase IV - Decontamination Facility Area Data Management Contact | Greg Lupton | Denise Arico |
| Data Validation Contact | James Chambers | Baohe Chen |
| Field Data Validation Contact | Ervin O'Bryan | James Chambers |
| FACTS/SED Database Contact | Mark Turner | Susan Marsh |
| QA/QC Contact | Reinhard Friske | Darren Wessel |
| Safety and Health Contact | Garner Powell | Jeff Middaugh |

DOE - U.S. Department of Energy
FACTS - Fernald Analytical Computerized Tracking System
QA/QC - Quality Assurance/Quality Control
SED - Sitewide Environmental Database
WAO - Waste Acceptance Organization




LEGEND:

A1PIV DECONTAMINATION AREA BOUNDARY

SCALE

150 75 0 150 FEET

FIGURE 1-1. LOCATION MAP FOR A1PIV - DECONTAMINATION AREA

v:\2fm12\dgn\decon_facility_002.dgn
STATE PLANAR COORDINATE SYSTEM 1983
02-OCT-2006

# 2.0 HISTORICAL DATA AND SOIL PRECERTIFICATION DATA

In accordance with the SEP, prior to conducting precertification and certification activities, all soil demonstrated to contain contamination above the associated FRLs or other applicable action levels must be evaluated for remedial actions.

The Project Specific Plan (PSP) for Predesign Investigation in Area 5 (DOE 2002), the Remedial Investigation Reports (RI, DOE 1995a and 1995b), and Feasibility Study Reports (FS, DOE 1995c and 1995d) for Operable Units (OU) 3 and 5 were used for remedial design of Area 1, Phase IV – Decontamination Facility. Area 1, Phase IV lies in what was previously defined as Area 5 when the predesign investigation was performed. Final grade excavation monitoring/sampling and real-time scanning/sampling data have been collected pursuant to the RI/FS and remedial activities.

Before initiating the certification process, all historical soil data within the Area 1, Phase IV - Decontamination Facility certification area were pulled from the Sitewide Environmental Database (SED). The data are summarized in Section 2.1. Based on the results of sampling and scanning activities summarized in Section 2.1, it has been determined that no additional remedial actions are necessary to remove above-FRL or above-waste acceptance criteria (WAC) soil in this area.

The concrete pads and footers of the former Decontamination Facility and the Decontamination Facility Expansion Pad were removed.

## 2.1 AREA 1, PHASE IV - DECONTAMINATION FACILITY AREA

### 2.1.1 Area 1, Phase IV - Decontamination Facility Area Historical, Predesign and Excavation Control

All historical data for Area 1, Phase IV - Decontamination Facility Area are presented in the Excavation Plan for Area 1, Phase IV (DOE 2003). This includes data collected during the Remedial Investigation/Feasibility Study (RI/FS), Area 1, Phase 2 Project Specific Plan for Field Sampling of Miscellaneous Areas (DOE 1997), the Project Specific Plan for Area 1, Phase II Certified for Reuse Areas, Trap Range, Sector 2C, and Sector 3 Certification Sampling (DOE 2000), Predesign Investigation in Area 5 (DOE 2002), and the Project Specific Plan for Area 1, Phase IV Excavation Characterization and Precertification (DOE 2004). There were no contamination driven excavations in this area.

### 2.1.2 Precertification Data

According to guidelines established in Section 3.3.3 of the SEP, precertification activities were conducted to evaluate residual radiological contamination patterns as specified in the PSP Guidelines for General Characterization for Sitewide Soil Remediation (DOE 2005). All areas in Area 1, Phase IV - Decontamination Facility Area passed the requirements of precertification. The results of the precertification scans are presented on data maps in Appendix B.

# 3.0 AREA-SPECIFIC CONSTITUENTS OF CONCERN

In the Operable Unit (OU) 5 Record of Decision (ROD) (DOE 1996), there are 80 soil COCs with established FRLs. These COCs were retained for further investigation based on a screening process that considered the presence of the constituent in site soil and the potential risk to a receptor exposed to soil containing this contaminant. In spite of the conservative nature of this COC retention process, many of the COCs with established FRLs have a limited distribution in site soil or the presence of the COC is based on high contract required detection limits (CRDLs). When FRLs were established for these COCs in the OU5 ROD, the FRLs were initially screened against site data presented on spatial maps to establish a picture of potential remediation areas.

By reviewing existing RI/FS data presented on spatial distribution maps, the sitewide list of soil COCs in the OU5 ROD was reduced from 80 to 30. This reduction was possible because the majority of the COCs with FRLs listed in the OU5 ROD have no detections above their corresponding FRL, thus eliminating them from further consideration. The 30 remaining sitewide COCs account for over 99 percent of the combined risk to a site receptor model, and they comprise the list from which all of the remediation ASCOCs are drawn. When planning certification for a remediation area, additional selection criteria are used to derive a subset of these 30 COCs. This subset of COCs is passed along to the certification process.

## 3.1 SELECTION CRITERIA

The selection process for retaining ASCOCs for a remediation area is driven by applying a set of decision criteria. A soil contaminant will be retained as an ASCOC if:

- It is listed as a soil COC in the OU5 ROD, and it is listed as an ASCOC in Table 2-7 of the SEP for the Remediation Area of interest;
- It is listed as a COC for the Hazardous Waste Management Units (HWMU(s) of interest (Table 2-1 of the SEP) or the underground storage tank (UST) of interest (Table 2-2 of the SEP) that lies within the certification area boundary;
- It can be traced to site use in the remediation area of interest, either through process knowledge or known release of the constituent to the environment;
- Analytical results indicate that a contaminant is present above its FRL, and the above-FRL concentrations are not attributable to false positives or elevated CRDLs;
- Physical characteristics of the contaminant, such as degradation rate and volatility, indicate it is likely to persist in the soil between time of release and remediation; or
- The contaminant is one of the sitewide primary COCs (total uranium, radium-226, radium-228, thorium-238, and thorium-232).

Using the above process, the ASCOCs were refined to those listed in Table 2-7 of the SEP. The list of ASCOCs is also presented in Table 3-1 with their respective FRLs.

### 3.1.1 ASCOC Selection

Each COC listed in Table 3-1 was evaluated for its relevance to Area 1, Phase IV - Decontamination Facility Area. Area 1, Phase IV - Decontamination Facility Area was previously part of Area 5; therefore, Table 3-1 contains the list of Area 5 COCs from Table 2-7 of the SEP. Due to the nature of decontamination operations, additional COCs were added to the list in Table 3-1. Table 3-2 presents the reasoning for either retaining or eliminating the ASCOCs. Table 3-3 lists the ASCOCs for Area 1, Phase IV - Decontamination Facility Area.

**TABLE 3-1**
**ASCOC LIST FOR REMEDIATION AREA 5[a]**

| ASCOC | FRL |
|---|---|
| **Radionuclides** | |
| Total Uranium | 82 mg/kg |
| Radium-226 | 1.7 pCi/g |
| Radium-228 | 1.8 pCi/g |
| Thorium-228 | 1.7 pCi/g |
| Thorium-232 | 1.5 pCi/g |
| **Organic** | |
| Aroclor-1254 | 0.13 mg/kg |
| Aroclor-1260 | 0.13 mg/kg |
| Dieldrin | 0.015 mg/kg |
| **Metals** | |
| Arsenic | 12.0 mg/kg |
| Beryllium | 1.5 mg/kg |

[a]Area 1, Phase IV - Decontamination Facility Area was previously part of Area 5
mg/kg - milligrams per kilogram
pCi/g - picoCuries per gram

**TABLE 3-2**
**ASCOC LIST FOR AREA 1, PHASE IV - DECONTAMINATION FACILITY AREA**

| ASCOC | Retained as ASCOC? | Justification | CUs |
|---|---|---|---|
| **Radionuclides** | | | |
| Total Uranium | Yes | Primary radionuclide | All |
| Radium-226 | Yes | Primary radionuclide | All |
| Radium-228 | Yes | Primary radionuclide | All |
| Thorium-228 | Yes | Primary radionuclide | All |
| Thorium-232 | Yes | Primary radionuclide | All |
| Cesium-137 | Yes | Potential contaminant from remediation activities. | All |
| Lead-210 | Yes | Potential contaminant from remediation activities. | All |
| Technetium-99 | Yes | Potential contaminant from remediation activities. | All |
| Thorium-230 | Yes | Potential contaminant from remediation activities. | All |
| **Organic** | | | |
| 1,1-dichloroethene | Yes | Potential contaminant from remediation activities. | All |
| 1,1,1-trichloroethane | Yes | Potential contaminant from remediation activities. | All |
| 1,2-dichloroethene | Yes | Potential contaminant from remediation activities. | All |
| 2-Butanone | Yes | Potential contaminant from decontamination operations. | All |
| 4-Methyl-2-pentanone | Yes | Potential contaminant from decontamination operations. | All |
| Acetone | Yes | Potential contaminant from decontamination operations. | All |
| Aroclor-1254 | Yes | Potential contaminant from remediation activities. | All |
| Aroclor-1260 | Yes | Potential contaminant from remediation activities. | All |
| Benzene | Yes | Potential contaminant from decontamination operations. | All |
| Benzo(a)anthracene | Yes | Potential contaminant from remediation activities. | All |
| Benzo(a)pyrene | Yes | Potential contaminant from remediation activities. | All |
| Benzo(b)fluoranthene | Yes | Potential contaminant from remediation activities. | All |
| Benzo(g,h,i)perylene | Yes | Potential contaminant from remediation activities. | All |
| Benzo(k)fluoranthene | Yes | Potential contaminant from remediation activities. | All |
| Bromodichloromethane | Yes | Potential contaminant from remediation activities. | All |
| Chrysene | Yes | Potential contaminant from remediation activities. | All |
| Dieldrin | Yes | Potential contaminant from remediation activities. | All |
| Dibenzo(a,h)anthracene | Yes | Potential contaminant from remediation activities. | All |
| Ethylbenzene | Yes | Potential contaminant from decontamination operations. | All |
| Fluoranthene | Yes | Potential contaminant from remediation activities. | All |
| Indeno(1,2,3-cd)pyrene | Yes | Potential contaminant from remediation activities. | All |
| Methylene Chloride | Yes | Potential contaminant from decontamination operations. | All |
| Phenanthrene | Yes | Potential contaminant from remediation activities. | All |
| Pyrene | Yes | Potential contaminant from remediation activities. | All |
| Tetrachloroethene | Yes | Potential contaminant from remediation activities. | All |
| Toluene | Yes | Potential contaminant from decontamination operations. | All |
| Trichloroethene | Yes | Potential contaminant from remediation activities. | All |
| Xylenes, total | Yes | Potential contaminant from decontamination operations. | All |

**TABLE 3-2**
**(Continued)**

| ASCOC | Retained as ASCOC? | Justification | CU(s) |
|---|---|---|---|
| **Metals** | | | |
| Arsenic | Yes | Potential contaminant from remediation activities. | All |
| Barium | Yes | Potential contaminant from remediation activities. | All |
| Beryllium | Yes | Potential contaminant from remediation activities. | All |
| Cadmium | Yes | Potential contaminant from remediation activities. | All |
| Chromium | Yes | Potential contaminant from remediation activities. | All |
| Lead | Yes | Potential contaminant from remediation activities. | All |
| Mercury | Yes | Potential contaminant from remediation activities. | All |
| Selenium | Yes | Potential contaminant from remediation activities. | All |
| Silver | Yes | Potential contaminant from remediation activities. | All |

**TABLE 3-3**
**AREA 1, PHASE IV – DECONTAMINATION FACILITY AREA FINAL ASCOC LIST**

| ASCOC | FRL/(*BTV*) [a] |
|---|---|
| **Radionuclides** | |
| Total Uranium | 82 mg/kg |
| Radium-226 | 1.7 pCi/g |
| Radium-228 | 1.8 pCi/g |
| Thorium-228 | 1.7 pCi/g |
| Thorium-232 | 1.5 pCi/g |
| Cesium-137 | 1.4 pCi/g |
| Lead-210 | 38 pCi/g |
| Neptunium-237 | 3.2 pCi/g |
| Technetium-99 | 30 pCi/g |
| Thorium-230 | 280 pCi/g |
| **Organic** | |
| 1,1-dichloroethene | 0.41 mg/kg |
| 1,1,1-trichloroethane | 4.3 mg/kg [b] |
| 1,2-dichloroethene | 0.16 mg/kg |
| 2-Butanone[c] | 23.5 mg/kg |
| 4-Methyl-2-pentanone | 2,500 mg/kg |
| Acetone | 43,000 mg/kg |
| Aroclor-1254 | 0.13 mg/kg |
| Aroclor-1260 | 0.13 mg/kg |
| Benzene | 850 mg/kg |
| Benzo(a)anthracene | 20 mg/kg (*1.0 mg/kg*) |
| Benzo(a)pyrene | 2.0 mg/kg (*1.0 mg/kg*) |
| Benzo(b)fluoranthene | 20 mg/kg (*1.0 mg/kg*) |
| Benzo(g,h,i)perylene | *1.0 mg/kg* |
| Benzo(k)fluoranthene | 200 mg/kg (*1.0 mg/kg*) |
| Bromodichloromethane | 4.0 mg/kg |
| Chrysene | 2,000 mg/kg (*1.0 mg/kg*) |
| Dieldrin | 0.015 mg/kg |
| Dibenzo(a,h)anthracene | 2.0 mg/kg (*0.088 mg/kg*) |
| Ethylbenzene | 5,100 mg/kg |
| Fluoranthene | *10 mg/kg* |
| Indeno(1,2,3-cd)pyrene | 20 mg/kg (*1.0 mg/kg*) |
| Methylene Chloride | 37 mg/kg |
| Phenanthrene | *5 mg/kg* |
| Pyrene | *10 mg/kg* |
| Tetrachloroethene | 3.6 mg/kg |
| Toluene | 100,000 mg/kg |
| Trichloroethene | 25 mg/kg |
| Xylenes, total | 920,000 mg/kg |

**TABLE 3-3**
**(Continued)**

| ASCOC | FRL/(*BTV*) [a] |
|---|---|
| **Metals** | |
| Arsenic | 12.0 mg/kg |
| Barium | 68,000 mg/kg |
| Beryllium | 1.5 mg/kg |
| Cadmium | 82 mg/kg |
| Chromium | 300 mg/kg |
| Lead | 400 mg/kg |
| Mercury | 7.5 mg/kg |
| Selenium | 5400 mg/kg |
| Silver | 29,000 mg/kg |

[a]BTV applies to Ecological COCs.

[b]The FRL is actually for 1,1,2-trichloroethane because 1,1,1-trichloroethane does not have a FRL. This value will be used for statistical comparison for certification criteria.

[c]2-Butanone (Methyl Ethyl Ketone) does not have an associated soil FRL. The Closure Plan Review Guidance for RCRA Facilities (OEPA 2004) (Table 1) has set the cleanup goal at 23.5 mg/kg.

[d]The FRL is actually for hexavalent chromium because total chromium does not have a FRL.

# 4.0 CERTIFICATION APPROACH

## 4.1 CERTIFICATION DESIGN

The certification design for Area 1, Phase IV - Decontamination Facility Area follows the general approach outlined in Section 3.4 of the SEP. As discussed in Section 3.0 of this document, the five primary ASCOCs (total uranium, radium-226, radium-228, thorium-228, and thorium-232) apply to each CU, and additional secondary COCs are identified based on the type of operations conducted in the area.

The factors that were taken into account when determining the boundaries for the soil CU within Area 1, Phase IV - Decontamination Facility Area include: historical use, proximity to other areas of the site, and residual COC data. Additionally, Area 1, Phase IV - Decontamination Facility Area is comprised of Group 1 CUs to allow for more concentrated sampling and to ensure decontamination activities had no effect on the soil.

### 4.1.1 Certification Unit Design

Area 1, Phase IV - Decontamination Facility Area consists of a CU (CU5), designed to cover the soil throughout the entire area. The CU design is depicted in Figure 1-1.

### 4.1.2 Sample Location Design

The selection of certification sampling locations was conducted according to Section 3.4.2 of the SEP. Each CU was first divided into 16 approximately equal sub-CUs. Sample locations were then generated by randomly selecting an easting and northing coordinate within the boundaries of each sub-CU, then testing those locations against the minimum distance criteria for the CU. If the minimum distance criteria were not met, an alternative random location was selected for that sub-CU, and all the locations were re-tested. This process continued, until all random locations met the minimum distance criteria.

All Area 1, Phase IV - Decontamination Facility Area sub-CUs and planned certification sampling locations are shown on Figure 4-1. Samples will be collected for analysis from the top six inches of soil in CU 5. All 16 sample locations in the CU will be sampled. One sample location is designated with a "D," indicating a field duplicate sample collection location. Prior to commencement of certification sampling field activities, all certification sample locations will be surveyed and field verified to ensure no surface obstacles prevent sample collection at the planned location. Locations may be moved if a subsurface obstacle prevents sample collection. Requirements for moving a certification sample location are discussed below in Section 4.3.1.

## 4.2 SURVEYING

Before certification sampling activities begin, the North American Datum of 1983 (NAD83) State Planar coordinates for each selected sampling location will be surveyed and identified in the field with a flag. All locations will be field verified to ensure no surface obstacles will prevent collection at each of the planned locations.

The Area 1, Phase IV - Decontamination Facility Area CU boundaries and sampling locations for CU 5 are shown on Figure 4-1. All tentative certification sample locations meet the minimum distance criterion. All sample location information can be found in Appendix C.

## 4.3 PHYSICAL SOIL SAMPLE COLLECTION

### 4.3.1 Sample Collection

Soil samples will be collected in accordance with procedure SMPL-01, Solids Sampling. Surface samples will be collected using 3-inch diameter, 6-inch long, plastic liners, or an alternate method as identified in SMPL-01, as long as sufficient volume is collected from the appropriate depth to perform the prescribed analyses. Ultimately, the method of sample collection will be left to the discretion of the Field Sampling Lead. Following sample collection, each soil core shall be divided, if necessary, and placed into the proper sample containers. Upon completion of sample collection, the boreholes will be collapsed and no additional abandonment is necessary.

Quality control sample requirements will include a duplicate field sample, a trip blank, and a container blank and/or rinsate, and will be collected per procedure SMPL-21, Collection of Field Quality Control Samples. For the duplicate field sample, twice the soil volume (a second core) will be collected at one location in the CU, and will not be homogenized with the original sample. The location that requires the collection of a duplicate sample is identified in Appendix C. A trip blank will be collected each day that volatile organic compound (VOC) samples are collected, or one per 20 VOC samples that are collected, or one per cooler that will be shipped, whichever is more frequent. Depending on the sample collection method used, container blanks and/or rinsates will be collected. If container blanks are collected, one will be done before sample collection begins and one at the conclusion of sample collection for the entire Area 1, Phase IV - Decontamination Facility Area. If rinsate(s) are required, one rinsate will be collected at a minimum frequency of one per 20 pieces of equipment reused in the field. All samples will be assigned unique sample identification numbers.

If a subsurface obstacle prevents collection of a soil sample at the specified location, it can be moved according to the following guidelines:

- The distance moved must be as small as possible (less than 3 feet);
- It must remain within the boundary of the sub-CU, and must still meet the minimum distance criterion;
- If the distance moved is greater than 3 feet, the move must be documented in a Variance/Field Change Notice (V/FCN), considered as significant, which will be approved by the agencies prior to collection.
- Anytime a location is moved, the appropriate figure should be used to determine the best direction to move the point to adhere to the above guidelines. The Characterization Manager or designee should be contacted when a sample location is moved. All final sampling locations will be documented in the Area 1, Phase IV - Decontamination Facility Area Certification Report.

Customer sample numbers and FACTS identification numbers will be assigned to all samples collected. The sample labels will be completed with sample collection information, and technicians will complete a Field Activity Log (FAL), a Sample Collection Log, and a Chain of Custody/Request for Analysis form in the field prior to submittal of the samples.

All samples from the CU with like analyses (including the field duplicate) will be batched and submitted to the Sample Processing Laboratory (SPL) under one set of Chain of Custody/Request for Analysis forms which will represent one analytical release. The container blank and/or rinsate will be listed on a separate Chain of Custody/Request for Analysis form. No alpha/beta screens will be required, as historical information can be used for shipping purposes.

### 4.3.2 Equipment Decontamination

Decontamination is performed to prevent the introduction of contaminants from sampling equipment to subsequent soil samples. Field Technicians will ensure that sampling equipment (core tubes and caps) has been decontaminated prior to transport to the field. As described in SMPL-01, all sampling equipment will have been decontaminated before it is transported to the field site, and the 6-inch core liners will be decontaminated using the Level II procedure [Section K.11 of the Sitewide Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ)] upon receipt from the manufacturer. Decontamination is also necessary in the field if sampling equipment is reused. If an alternate sampling method is used, equipment will be decontaminated between sampling locations, and again after the sampling performed under this PSP is completed. Following decontamination, clean disposable wipes may be used to replace air-drying of the equipment.

### 4.3.3 Physical Sample Identification

Each soil certification sample will be assigned a unique sample identification number as *Remediation Area-C##-Location^Analysis-QC,* where:

| | | |
|---|---|---|
| A1P4 | = | Sample collected from Remediation Area 1, Phase IV - Decontamination Facility Area |
| C## | = | Certification unit from which sample was collected |
| Location | = | Sample location number within the CU [1 through 16] |
| Analysis | = | "R" indicates radiological analysis; "M" indicates metals analysis; "P" indicates polychlorinated biphenyl (PCB) analysis; "S" indicates semi-volatile organic compound (SVOC) analysis; and "L" indicates VOC analysis. |
| QC | = | Quality control sample, if applicable. A "D" indicates a field duplicate sample; "Y1" indicates the first container blank sample; "X1" indicates the first rinsate sample; "TB1" indicates the first trip blank collected, and each additional trip blank collected will be consecutively numbered. |

For example, a field duplicate sample taken from the 4th sample location from Area 1, Phase IV - Decontamination Facility Area CU 5 for VOC analysis would be identified as A1P4-C05-4^L-D. If a rinsate sample is required, the first rinsate sample will be identified as A1P4-C-X1-M. If a container blank is required, the first container blank will be identified as A1P4-C-Y1-M. The first trip blank will be identified as A1P4-C-L-TB1. It should be noted that the "^" symbol should not be included in the sample number for container blanks, rinsates, and trip blanks.

## 4.4 ANALYTICAL METHODOLOGY

All soil samples from the CU with like analyses (including the field duplicate) will be batched and submitted to the SPL under one set of Chain of Custody/Request for Analysis forms, which will represent one analytical release. Container blanks will be listed on a separate Chain of Custody/Request for Analysis form but may be batched together in one analytical release.

All samples will be prepared for shipment to off-site laboratories per procedure 9501, Shipping Samples to Off-site Laboratories. Samples will only be shipped to off-site laboratories that are listed on the Fluor Fernald Approved Laboratories List. Historical data from the area will be used to ship the samples off-site. The highest post-excavation total uranium result from Area 1, Phase IV - Decontamination Facility Area is 29.9 mg/kg from boring A1P4-C05-1-1.

Samples collected for VOC analysis should be shipped to an off-site laboratory within 24 hours of sample collection. As soon as the samples arrive at the laboratory, all samples should be prepared for analysis (including homogenization), and radiological samples should be sealed to begin the in-growth period for radium analysis. A 10-day turnaround time (TAT) will be required for all analyses and data reporting.

Therefore, a 7-day in-growth for all gamma analyses is required, with the electronic data deliverable being reported 10 days after laboratory receipt and the final data package being reported 14 days after laboratory receipt.

Once all the radium-226 data (from the 7-day in-growth) for a CU have been evaluated by the Characterization Lead, the laboratory shall be notified to recount the sample with the highest result for radium-226 following a 21-day in-growth. The recount data shall be reported in 30 days (certificates of analysis and electronic data deliverable). All gamma analyses will have an identifier from the lab indicating whether the result represents a 7-day or 21-day in-growth. Samples with a 7-day in-growth will be denoted by a "7DAY" suffix while the sample chosen as a 21-day in-growth will be denoted by a "21DAY" suffix within the electronic data deliverable (EDD).

The sampling, analytical, and data reporting requirements are listed in Table 4-1 and the Target Analyte Lists (TAL) are shown in Table 4-2.

Laboratory analysis of certification samples will be conducted using an approved analytical method, as discussed in Appendix H of the SEP. Analyses will be conducted to Analytical Support Level (ASL) D or E, where all requirements for ASL E are the same as ASL D except the minimum detection level for the selected analytical method must be at least 10 percent of the FRL.

A minimum of 10 percent of the laboratory data will be validated to Validation Support Level (VSL) D (CU 5) and the remainder validated to VSL B, with the exception of the 21-day in-growth radium-226 samples, which will not be validated. Samples rejected during validation will be re-analyzed, or another sample will be collected and submitted for analysis.

## 4.5 STATISTICAL ANALYSIS

Once data are validated, results will be entered into the SED and a statistical analysis will be performed to evaluate the pass/fail criteria for each CU. The statistical approach is discussed in Section 3.4.3 and Appendix G of the SEP, and will be the same for Area 1, Phase IV - Decontamination Facility Area as has been for previous certification efforts.

Two criteria must be met for the CU to pass certification. If the data distribution is normal or lognormal, the first criterion compares the 95 percent upper confidence limit (UCL) on the mean of each primary ASCOC, or the 90 percent UCL on the mean of each secondary ASCOC, to its FRL. On an individual CU basis, any ASCOC with the applicable 95 or 90 percent UCL above the FRL results in that CU failing certification. If the data distribution is not normal or lognormal, the appropriate nonparametric approach discussed in Appendix G of the SEP will be used to evaluate the first criterion. The second criterion is

related to individual samples. An individual sample cannot be greater than two times the FRL (i.e., hotspot criterion). When the given UCL on the mean for each ASCOC is less than its FRL, and the hot spot criterion is met, the CU has met both criteria and will be considered certified.

There are three conditions that could result in a CU failing certification: 1) high variability in the data set; 2) localized contamination; and 3) widespread contamination. Details on the evaluation and responses to these possible outcomes are provided in Section 3.4.5 of the SEP. When the CU within the scope of this CDL has passed certification, a certification report will be issued. The certification report will be submitted to the U.S. Environmental Protection Agency (EPA) and Ohio Environmental Protection Agency (OEPA) to receive acknowledgement that the pertinent OU remedial actions were completed and the CU is certified and ready to be released for interim or final land use. Section 7.4 of the SEP provides additional details and describes the required content of the Certification Report.

**TABLE 4-1**
**SAMPLING AND ANALYTICAL REQUIREMENTS**

| Analyte[a] | Method[a] | Matrix | Preserve | TAT | Container[c] | Minimum Mass/Volume |
|---|---|---|---|---|---|---|
| Rads/Metals/ Pesticide/PCBs/ SVOC (TALs ABCD) | Gamma Spec | Solid | Cool, 4° C | EDD 10 days[b] Final 14 days | Glass with Teflon-lined lid (soil) | 500 g (1500 g)[d] |
| | Alpha Spec, and LSC | | | 10 days | | |
| | ICP or ICP/MS or CVAA | | | 10 days | | |
| | GC | | | 10 days | | |
| VOCs (TAL E) | GC/MS | Solid | Cool, 4° C | 10 days | 3 x 1-Encore Sampler plus 1 x 2-oz jar for % moisture | Each full Encore Sampler will hold approx. 5 g |
| Metals (TAL D) | ICP or ICP/MS or CVAA | Liquid (rinsate[e]) | $HNO_3$ pH<2 | 10 days | Polyethylene | 500 ml |
| VOCs (TAL E) | GC/MS | Liquid (trip blank) | $H_2SO_4$ pH<2 Cool, 4° C | 10 days | 3 x 40-ml glass with teflon-lined septa | 120 ml (no headspace) |

[a] Samples will be analyzed according to ASL D requirements but the minimum detection level may cause some analyses to be considered ASL E.

[b] One sample per CU will be selected for analysis (radium-226 only) utilizing a 21-day in-growth with a 30-day TAT. Samples with a 7-day in-growth will be denoted by a "7DAY" suffix while the sample chosen as a 21-day in-growth will be denoted by a "21DAY" suffix attached to the laboratory data.

[c] Sample container types may be changed at the direction of the Field Sampling Lead, as long as the volume requirements, container compatibility requirements, and SCQ requirements are met.

[d] At the direction of the Field Sampling Lead, triple the specified volume must be collected for all samples at one location in the CU in order for the contract laboratory to perform the required quality control analysis. The samples shall be identified on the Chain of Custody/Request for Analysis forms as "designated for laboratory QC".

[e] If "push tubes" are used for sampling, the off-site laboratories will be sent container blanks. If an alternative sample method is used, the Field Technicians will collect a rinsate.

CVAA - Cold Vapor Atomic Absorption
GC/MS - gas chromatography mass spectroscopy
GC - gas chromatography
ICP/MS - inductively coupled plasma/mass spectroscopy
LSC - liquid scintillation counting
EDD - electronic data deliverable

# TABLE 4-2
# TARGET ANALYTE LISTS

**20730-PSP-0006-A**
**17 Soil Samples**
**(Radiological - ASL D/E*)**

| Analyte | On-Property FRL | MDL (soil) |
|---|---|---|
| Total Uranium | 20 mg/kg | 3.0 mg/kg |
| Radium-226 | 1.7 pCi/g | 0.3 pCi/g |
| Radium-228 | 1.8 pCi/g | 0.3 pCi/g |
| Thorium-228 | 1.7 pCi/g | 0.3 pCi/g |
| Thorium-232 | 1.5 pCi/g | 0.3 pCi/g |
| Cesium-137 | 1.4 pCi/g | 0.3 pCi/g |
| Lead-210 | 38 pCi/g | 10 pCi/g |
| Technetium-99 | 30 pCi/g | 2.91 pCi/g[a] |
| Thorium-230 | 280 pCi/g | 28 pCi/g |

**20730-PSP-0006-B**
**17 Soil Samples**
**(Pesticide/PCBs - ASL D/E*)**

| Analyte | On-Property FRL | MDL (soil) |
|---|---|---|
| Aroclor-1254 | 0.13 mg/kg | 0.013 mg/kg |
| Aroclor-1260 | 0.13 mg/kg | 0.013 mg/kg |
| Dieldrin | 0.015 mg/kg | 0.0015 mg/kg |

**20730-PSP-0006-C**
**17 Soil Samples**
**(SVOCs - ASL D/E*)**

| Analyte | FRL/BTVa | MDL[a] |
|---|---|---|
| Benzo(a)anthracene | 20 mg/kg / 1.0 mg/kg | 2.0 mg/kg |
| Benzo(a)pyrene | 2.0 mg/kg / 1.0 mg/kg | 0.2 mg/kg |
| Benzo(b)fluoranthene | 20 mg/kg / 1.0 mg/kg | 2.0 mg/kg |
| Benzo(g,h,i)perylene | 1.0 mg/kg | 0.1 mg/kg |
| Benzo(k)fluoranthene | 200 mg/kg / 1.0 mg/kg | 20 mg/kg |
| Chrysene | 2,000 mg/kg / 1.0 mg/kg | 200 mg/kg |
| Dibenzo(a,h)anthracene | 2.0 mg/kg / 0.088 mg/kg | 0.2 mg/kg |
| Fluoranthene | 10 mg/kg | 1.0 mg/kg |
| Indeno(1,2,3-cd)pyrene | 20 mg/kg / 1.0 mg/kg | 2.0 mg/kg |
| Phenanthrene | 5 mg/kg | 0.5 mg/kg |
| Pyrene | 10 mg/kg | 1.0 mg/kg |

**20730-PSP-0006-D**
**17 Soil Samples**
**(Metals - ASL D/E*)**

| Analyte | FRL | MDL | MDL (water) |
|---|---|---|---|
| Arsenic | 12 mg/kg | 1.2 mg/kg | 1.8 mg/L |
| Barium | 68,000 mg/kg | 200 mg/kg | 10,200 mg/L |
| Beryllium | 1.5 mg/kg | 0.15 mg/kg | 0.22 mg/L |
| Cadmium | 82 mg/kg | 8.2 mg/kg | 0.75 mg/L |
| Chromium | 300 mg/kg | 30 mg/kg | 45 mg/L |
| Lead | 400 mg/kg | 40 mg/kg | 30 mg/L |
| Mercury | 7.5 mg/kg | 0.75 mg/kg | 0.75 mg/L |
| Selenium | 5400 mg/kg | 10 mg/kg | 810 mg/L |
| Silver | 29,000 mg/kg | 40 mg/kg | 1.5 mg/L |

**20730-PSP-0006-E**
**17 Soil Samples**
**(VOCs - ASL D/E*)**

| Analyte | FRL | MDL | MDL (water) |
|---|---|---|---|
| Bromodichloromethane | 4.0 mg/kg | 0.4 mg/kg | 10 µg/L |
| 1,1-Dichloroethene | 0.41 mg/kg | 0.041 mg/kg | 10 µg/L |
| 1,1,1-Trichloroethane | 4.3 mg/kg | 0.43 mg/kg | 10 µg/L |
| 1,2-Dichloroethene | 0.16 mg/kg | 0.016 mg/kg | 10 µg/L |
| 2-Butanone[b] | 23.5 mg/kg | 2.35 mg/kg | 10 µg/L |
| 4-Methyl-2-pentanone | 2,500 mg/kg | 250 mg/kg | 10 µg/L |
| Acetone | 43,000 mg/kg | 4,300 mg/kg | 10 µg/L |
| Benzene | 850 mg/kg | 85 mg/kg | 10 µg/L |
| Ethylbenzene | 5,100 mg/kg | 510 mg/kg | 10 µg/L |
| Methylene Chloride | 37 mg/kg | 3.7 mg/kg | 10 µg/L |
| Tetrachloroethene | 3.6 mg/kg | 0.36 mg/kg | 10 µg/L |
| Toluene | 100,000 mg/kg | 10,000 mg/kg | 10 µg/L |
| Trichloroethene | 25 mg/kg | 2.5 mg/kg | 10 µg/L |
| Xylenes, total | 920,000 mg/kg | 92,000 mg/kg | 10 µg/L |

* Analytical requirements will meet ASL D but the minimum detection level (MDL) may cause some analyses to be considered ASL E.

[a] The MDL for technetium-99 is 10 percent of the WAC limit, which is lower than the FRL.

[b] 2-Butanone (Methyl Ethyl Ketone) does not have an associated soil FRL. The Closure Plan Review Guidance for RCRA Facilities (OEPA 2004) (Table 1) has set the cleanup goal at 23.5 mg/kg.

mg/L milligrams per liter
µg/L - micrograms per liter
pCi/L - picoCuries per liter

FIGURE 4-1. SOIL CERTIFICATION SAMPLING LOCATIONS FOR CU05

# 5.0 SCHEDULE

The following draft schedule shows key activities for the completion of the work within the scope of this CDL/Certification PSP.

| Activity | Target Date |
|---|---|
| Submittal of Certification Design Letter | October 23, 2006 |
| Start of Certification Sampling | Completed |
| Complete Field Work | Completed |
| Complete Analytical Work | Completed |
| Complete Data Validation and Statistical Analysis | October 26, 2006 |
| Submit Certification Report | October 27, 2006a |

[a]The date for submittal of the Certification Report is a commitment to EPA and OEPA. Other dates are internal target completion dates.

# 6.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

## 6.1 FIELD QUALITY CONTROL SAMPLES, ANALYTICAL REQUIREMENTS AND DATA VALIDATION

Per requirements of the SEP and Data Quality Objectives SL-052, Revision 3 (Appendix D), the field quality control, analytical and data validation requirements are as follows:

- Field QC requirements include one field duplicate for the CU, as noted in Section 4.3 and identified in Appendix C. The field duplicate sample will be analyzed for the same COCs as the other samples in the CU from which the field duplicate has been collected.

- If "push tubes" are used for sample collection, one container blank will be collected before sample collection begins and one will be collected at the conclusion of sample collection for the entire Area 1, Phase IV - Decontamination Facility Area. The container blank sample will be analyzed for all of the metal COCs required for Area 1, Phase IV - Decontamination Facility Area. If an alternate sample collection method is used, one rinsate will be collected and analyzed for all of the metal COCs required for Area 1, Phase IV - Decontamination Facility Area at a minimum frequency of one per 20 pieces of equipment reused in the field.

- A trip blank is required if VOC samples are being collected. The trip blanks will be analyzed for all of the VOC COCs required for Area 1, Phase IV - Decontamination Facility Area. The frequency for a trip blank is one per day, or one per batch of 20 VOC samples collected, or one per cooler to be shipped, whichever is more frequent.

- All analyses will be performed at ASL D or E, where E meets the minimum detection level of 10 percent of the FRL and is above the SCQ ASL D detection level, but the analyses meet all other SCQ ASL D criteria. An ASL D data package will be provided for all of the data.

- All field data will be validated. A minimum of 10 percent of the laboratory data will be validated to VSL D with the remainder validated to VSL B. The following CUs will be validated to VSL D: A1P4-05. If any result is rejected during validation, the sample will be re-analyzed or another location will be sampled and analyzed in its place. If necessary, this change will be documented in a V/FCN.

Once all data are validated as required, results will be entered into the SED and a statistical analysis will be performed to evaluate the pass/fail criteria for the CU. The statistical approach is discussed in Section 3.4.3 and Appendix G of the SEP.

If any sample collection or analytical methods are used that are not in accordance with the SCQ, the Project Manager and Characterization Manager must determine if the qualitative data from the samples will be beneficial to certification decision making. If the data will be beneficial, the Project Manager and Characterization Manager will ensure that:

- A variance will be written to document references confirming that the new method supports data needs,

- variations from the SCQ methodology are documented in a variance, or data validation of the affected samples is requested or qualifier codes of J (estimated) and R (rejected) be attached to detected and non-detected results, respectively.

## 6.2 PROJECT SPECIFIC PROCEDURES, MANUALS AND DOCUMENTS

Programs supporting this work are responsible for ensuring team members work to and are trained to applicable documents. Additionally, programs supporting this work are responsible for ensuring team members in their organizations are qualified and maintain qualification for site access requirements. The Project Manager will be responsible for ensuring any project-specific training required to perform work per this PSP is conducted.

To ensure consistency and data integrity, field activities in support of the PSP will follow the requirements and responsibilities outlined in the procedures and guidance documents referenced below.

- 20100-HS-0002, Soil and Disposal Facility Project Integrated Health and Safety Plan
- Sitewide Excavation Plan (SEP)
- Sitewide CERCLA Quality Assurance Project Plan (SCQ)
- SH-1006, Event Investigation and Reporting
- ADM-02, Field Project Prerequisites
- EQT-06, Geoprobe® Model 5400 and Model 6600
- SMPL-01, Solids Sampling
- SMPL-21, Collection of Field Quality Control Samples
- 9501, Shipping Samples to Off-site Laboratories
- Trimble Pathfinder Pro-XL Global Positioning System (GPS) Operation Manual

## 6.3 INDEPENDENT ASSESSMENT

An independent assessment may be performed by the Fernald Closure Project (FCP) QA/QC organization, such as monitoring/observing on-going project activities and work areas to verify conformance to specified requirements. The surveillance will be planned and documented in accordance with Section 12.3 of the SCQ.

## 6.4 IMPLEMENTATION OF CHANGES

Before the implementation of changes, the Field Sampling Lead will be informed of the proposed changes. Once the Field Sampling Lead has obtained written or verbal approval (electronic mail is acceptable) from the Characterization Manager and QA/QC for the changes to the PSP, the changes may be implemented. Changes to the PSP will be noted in the applicable FALs and on a V/FCN. QA/QC must receive the completed V/FCN, which includes the signatures of the Characterization and Sampling Managers, Project Manager, and QA/QC within seven days of implementation of the change. The EPA and OEPA will be given a 15-day review period prior to implementing the change(s) for any V/FCNs identified as "significant" per project guidelines.

# 7.0 HEALTH AND SAFETY

Coordinate with representatives of the Health and Safety and Industrial Hygiene and Construction for requirements to enter this area. Any hazards identified during the project walkdown must be corrected/controlled prior to the start of work. Weekly walkdowns will be conducted throughout the course of the project in accordance with SPR 1-10, Safety Walk-Throughs. All work performed on this project will be performed in accordance with applicable Environmental Services procedures, RM-0020 (Radiological Control Requirements Manual), RM-0021 (Safety Performance Requirements Manual), Fluor Fernald work permits, Radiological Work Permit (RWP), penetration permits, Construction Traveler, and other applicable permits. The radiological work requirements for activities will be detailed in activity-specific RWPs. Concurrence with applicable safety permits is required by each technician in the performance of their assigned duties.

A safety briefing will be conducted prior to the initiation of field activities. Fluor Fernald managers and supervisors are responsible for ensuring that all field activities comply with the Safety and Health requirements and the Work Plan. These briefings will be documented and personnel must complete these briefings before they can participate in the execution of field activities.

Personnel will also be briefed on health and safety documents (such as Travelers) that apply to the project work scope. During the course of this project, operators shall maintain a 50-foot buffer zone between equipment and sampling personnel where field conditions and working space permit. When this buffer zone cannot be maintained, sampling personnel must communicate their intentions to move around or near the equipment with the operators through eye contact and verbal communication or hand signals. At no time shall the sampling activities be within 25 feet of operating heavy equipment without approval of both the project health and safety representative and construction management. Additionally, the sampling team will utilize traffic cones or other equipment to designate a safe buffer zone for their needs when the 50-foot boundary is not practical. Additional safety information can be found in 20100-HS-0002, Soil and Disposal Facility Project Integrated Health and Safety Plan. All personnel have stop-work authority for imminent safety hazards or other hazards resulting from noncompliance with the applicable safety and health practices.

All personnel entering the Construction Area will obtain a pre-entry briefing from Construction management on current activities or hazards that may affect their work from Construction management. Additionally, prior to entry into an excavation area, the Competent Person for Excavation shall be contacted to assure that the daily inspection has been completed and the excavation is safe to enter.

Sampling Leads will be provided with cellular phones for all sampling activities, and **all emergencies will be reported by dialing 911 and 648-6511**. Announcements for severe weather will be provided to select company issued cell phones. Cellular phones are provided to the Technicians by FCP, as needed. As soon as possible, field personnel are to contact their supervisor and Health and Safety Representative after any unplanned event or injury.

# 8.0 DISPOSITION OF WASTE

During sampling activities, field personnel may generate small amounts of soil, water, and contact waste. Excess soil generated during sample collection will be replaced in the borehole. Contact waste generation will be minimized by limiting contact with sample media, and by only using disposable materials that are necessary. Contact waste will be bagged and brought back to site for disposal in an uncontrolled area dumpster. Generation of decontamination waters will be minimized in the field. Decontamination water that is generated will be contained in a plastic bucket with a lid and returned to site for disposal. A wastewater discharge form must be completed for disposal. On-site decontamination of equipment will take place at a facility that discharges to the Converted Advanced Wastewater Treatment Facility, either directly or indirectly, through the storm water collection system.

Following analysis, any remaining soil and/or sample residuals will remain at the off-site laboratories for a specified period of time as defined in their contracts with Fluor Fernald. Prior authorization must be obtained from the Characterization Manager, or designee, to disposition samples collected under this PSP.

# 9.0 DATA MANAGEMENT

A data management process will be implemented so information collected during the investigation will be properly managed to satisfy data end use requirements after completion of field activities. As specified in Section 5.1 of the SCQ, sampling teams will describe daily activities on a FAL, which should be sufficiently detailed for accurate reconstruction of the events without reliance on memory. Sample Collection Logs will be completed according to protocols specified in Appendix B of the SCQ and in applicable procedures. These forms will be maintained in loose-leaf form and uniquely numbered following the sampling event.

All field measurements, observations, and sample collection information associated with physical sample collection will be recorded, as applicable, on the Sample Collection Log, the FAL, the Chain of Custody/Request for Analysis form, the Lithologic Log, and Borehole Abandonment Record. The PSP number will be on all documentation associated with these sampling activities.

Samples will be assigned a unique sample number as explained in Section 2.3 and listed in Appendix C. This unique sample identifier will appear on the Sample Collection Log and Chain of Custody/Request for Analysis form and will be used to identify the samples during analysis, data entry, and data management.

Technicians will review all field data for completeness and accuracy then forward the field data package to the Field Data Validation Contact for final QA/QC review. Sample Data Management personnel will enter analytical data into the SED. Analytical data that is designated for data validation will be forwarded to the Data Validation Group. The PSP requirements for analytical data validation are outlined in Section 4.1. The Data Management Lead will review analytical data when it is received from the off-site laboratories.

Following field and analytical data validation, the Sample Data Management organization will perform data entry into the SED. The original field data packages, original analytical data packages, and original documents generated during the validation process will be maintained as project records by the Sample Data Management organization.

To ensure that correct coordinates and survey information are tied to the final sample locations in the database, the following process will take place. Upon surveying all locations identified in the PSP, the Surveying Manager will provide the Data Management Lead (i.e., Characterization) with an electronic file of all surveyed coordinates and surface elevations. The Sampling Manager will provide the Data Management Lead with a list of any locations that must be moved during penetration permitting or sample collection, and the Data Management Lead will update the electronic file with this information. After sample collection is complete, the Data Management Lead will provide this electronic file to the Database Contact for uploading to SED.

# REFERENCES

Ohio Environmental Protection Agency, 2004, "Closure Plan Review Guidance for RCRA Facility in the Matter of: U.S. Department of Energy, Fernald Environmental Management Project, P.O. Box 398704, Cincinnati, OH 45239," Columbus, OH.

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U.S. Department of Energy, 1995c "Feasibility Study Report Operable Unit 3," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

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U.S. Department of Energy, 2000, "Project Specific Plan for Area 1, Phase 2 Certified for Reuse Areas, Trap Range, Sector 2C and Sector 3 Certification Sampling," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2002, "Predesign Investigation in Area 5," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2004, "Project Specific Plan for Area 1, Phase IV Excavation Characterization and Precertification," Final, Fernald Closure Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2005, "Project Specific Plan Guidelines for General Characterization for Sitewide Soil Remediation" Final, Fernald Closure Project, DOE, Fernald Area Office, Cincinnati, Ohio.

# APPENDIX A

# DATA QUALITY OBJECTIVES SL-052, REV. 3

Control Number _____

# Fernald Environmental Management Project

## Data Quality Objectives

Title: Sitewide Certification Sampling and Analysis

Number: SL-052

Revision: 3

Effective Date: March 13, 2000

Contact Name: Mike Rolfes

Approval: _____ Date: 3/13/00
James Chambers
DQO Coordinator

Approval: _____ Date: 3/13/00
J.D. Chiou
SCEP Project Director

| Rev. # | 0 | 1 | 2 | 3 | | | |
|---|---|---|---|---|---|---|---|
| Effective Date: | 4/28/99 | 6/10/99 | 2/3/00 | 3/13/00 | | | |

# DATA QUALITY OBJECTIVES
## Sitewide Certification Sampling and Analysis

**Members of Data Quality Objectives (DQO) Scoping Team**

The members of the scoping team included individuals with expertise in QA, analytical methods, field sampling, statistics, laboratory analytical methods and data management.

**Conceptual Model of the Site**

Soil sampling was conducted at the Fernald Environmental Management Project (FEMP) during the Operable Unit 5 (OU5) Remedial Investigation/Feasibility Study (RI/FS). Final Remediation Levels (FRLs) for constituents of concern (COCs), along with the extent of soil contaminated above the FRLs, were identified in the OU5 Record of Decision (ROD). Actual soil remediation activities now fall under the guidance of the final Sitewide Excavation Plan (SEP).

As outlined in the SEP, the FEMP has been divided into individual Remediation Areas (or phased areas within a Remediation Area) to sequentially carry out soil remedial activities. Under the strategy identified in the SEP, pre-design investigations are first conducted to better define the limits of soil excavation requirements. Following any necessary excavation, pre-certification real-time scanning activities are conducted to evaluate residual patterns of soil contamination. Pre-certification scan data should provide a level of assurance that the FRLs will be achieved. When pre-certification data indicate that remediation goals are likely to be met, they are used to define certification units (CUs) within the Remediation Area of interest. Table 2-9 of the final SEP identifies a list of area-specific COCs (ASCOCs) for each Remediation Area at the FEMP. Based on existing data and production knowledge, a subset of these ASCOCs are conservatively identified within each CU as potentially present in the CU. This suite of CU-specific COCs is the subset of the ASCOCs to be evaluated against the FRLs within that CU. At a minimum, the five primary radiological COCs (total uranium, radium-226, radium-228, thorium-228, thorium-232) will be retained as CU-specific COCs for certification of each CU.

Delineation and justification for the final CU boundaries, along with each corresponding suite of CU-specific ASCOCs is documented in a Certification Design Letter. Upon approval of the Certification Design Letter by the EPA, certification activities can begin. Section 3.4 of the final SEP presents the general certification strategy.

## 1.0 Statement of Problem

FEMP soil and potentially impacted adjacent off-property soil must be certified on a CU by CU basis for compliance with the FRLs of all CU-specific ASCOCs. The appropriate sampling, analytical and information management criteria must be developed to provide the required qualified data necessary to demonstrate attainment of certification statistical criteria. For every area undergoing certification, a sampling plan must be in place that will direct soil samples to be collected which are representative of the CU-specific COC concentrations within the framework of the certification approach identified in the final SEP. The appropriate analytical methodologies must be selected to provide the required data.

Exposure to Soil

The cleanup standards, or FRLs, were developed for a final site land use as an undeveloped park. Under this exposure scenario, receptors could be directly exposed to contaminated soil through dermal contact, external radiation, incidental ingestion, and/or inhalation of fugitive dust while visiting the park. Exposure to contaminated soil by the modeled receptor is expected to occur at random locations within the boundaries of the FEMP and would not be limited to any single area. Some soil FRLs were developed based on the modeled cross-media impact potential of soil contamination to the underlying aquifer. In these instances, potential exposure to contaminants would be indirect through the groundwater pathway, and not directly linked to soil exposure. Off-site soil FRLs were established at more conservative levels than the on-property soil FRLs, based on an agricultural receptor. Benchmark Toxicity Values (BTVs) are also being considered in the cleanup process by assessing habitat impact of individual BTVs under post-remedial conditions.

Available Resources

Time: Certification sampling will be accomplished by the field sampling team prior to interim or final regrading or release of soil for construction activities. The certification sampling schedule must allow sufficient time, in the event additional remediation is required, to demonstrate certification of FRLs prior to permanent construction or regrading. Certification sampling will have to be completed and analytical results validated and statistical analysis completed prior to submission of a Certification Report to the regulatory agencies.

Project Constraints: Certification sampling and analytical testing must be performed with existing manpower, materials and equipment to support the certification effort. Remediation areas are prioritized for certification sampling and analysis according to the date required for initiation of sequential construction activities in those areas. Fluor Daniel Fernald (FDF) and DOE must demonstrate post-remedial compliance with the CU-specific COC FRLs to release the designated Remediation Area for

planned interim grading, eventual restoration under the Natural Resources Restoration Plan (NRRP), and other final land use activities.

## 2.0 Identify the Decision

Decision

Demonstrate within each CU if all CU-specific COCs pass the certification criteria. These criteria are as follows: 1) The average concentration of each CU-specific COC is below the FRL and within the agreed upon confidence limits (95% for primary ASCOCs and 90% for secondary ASCOCs); and 2) the hot-spot criteria, that no result for any CU-specific COC is more than two times the associated soil FRL. The certification criteria are discussed in greater detail in Section 3.4.4 of the final SEP.

Possible Results

1. The average concentration of each CU-specific COC is demonstrated to be below the FRLs within the confidence level, with no single result for any CU-specific COC greater than two times the associated FRL. The CU can then be certified as attaining remediation goals.

2. The average concentration of at least one CU-specific COC is demonstrated to be above the FRL at the given confidence level. The CU will fail certification and require additional remedial action, per Section 3.4.5 of the final SEP.

3. If a result(s) of one or more CU-specific COC is demonstrated to be at or above two times the FRL, the CU will fail certification. The CU will fail certification and require additional remedial action per Section 3.4.5 of the final SEP. A combination of results 2 and 3 also constitutes certification failure.

## 3.0 Inputs That Affect the Decision

Required Information

Certification data will be obtained through physical soil sampling. Based on the certification analytical results, the average concentrations of each CU-specific COC with specified confidence levels will be calculated using the statistical methods identified in Appendix G of the final SEP.

Source of Information

Per the SEP, analysis of certification samples for each CU-specific COC will be conducted at analytical support level (ASL) D in accordance with methods and QA/QC standards in the FEMP Sitewide CERCLA Quality Assurance Project Plan [SCQ].

Contaminant-Specific Action Levels
The cleanup levels are the soil FRLs published in the OU5 and OU2 RODs. BTVs being considered in the remediation process are discussed for consideration during certification in Appendix C of the NRRP.

Methods of Sampling and Analysis
Physical soil samples will be collected in accordance with the applicable site sampling procedures. Per the SEP, laboratory analysis will be conducted at ASL D using QA/QC protocols specified in the SCQ. Full raw data deliverables will be required from the laboratory to allow for appropriate data validation. For FEMP-approved on- and off-site laboratories, the analytical method used will meet the required precision, accuracy and detection capabilities necessary to achieve FRL analyte ranges.

## 4.0 The Boundaries of the Situation

Spatial Boundaries
Domain of the Decision: The boundaries of this certification DQO extend to all surface, stockpile and fill soil in areas that are undergoing certification as part of FEMP remediation.

Population of Soil: Soil includes all excavated surfaces, undisturbed relatively unimpacted native soil, and sub-surface intervals (stockpile or fill areas only) in areas undergoing certification sampling and analysis.

Scale of Decision Making
Based on considerations of the final certification units and the COC evaluation process, the CU-specific COCs are determined. The area undergoing certification will be evaluated on a CU basis, based on physical sample results, as to whether it has passed or failed the criteria for attainment of certification (final SEP Section 3.4.4).

Temporal Boundaries
Time frame: Certification sampling must be performed in time to sequentially release certified areas for scheduled interim grading, restoration, and other final land use activities. Certification sampling data received from the laboratory will be validated and statistically evaluated. Certification results and findings will be documented in Certification Reports, which must be submitted to and approved by the regulatory agencies prior to release of the areas for scheduled interim grading, restoration, and other final land use activities.

Practical Considerations: Some areas undergoing remediation will not be accessible for certification sampling until decontamination/demolition and remedial excavation activities are complete. Other areas, such as wood lots, that are relatively uncontaminated and not planned for excavation, may require preparation, such as cutting of grass or removal of undergrowth prior to certification sampling, thus requiring coordination with FEMP Maintenance personnel.

## 5.0 Decision Rule

Successful certification of soil within the boundaries of a certification unit (CU) demonstrates that the certified soil (surface or subsurface) has concentrations of CU-specific COC(s) that meet the established criteria for attainment of Certification.

Parameters of Interest

The parameters of interest are the individual and average surface soil concentrations of CU-specific COCs and confidence limits on the calculated average within a CU. OU2 and OU5 ROD identify all applicable soil FRLs. The SEP identifies the ASCOCs, a subset of which will be used to establish CU-specific COCs within each Remediation Area undergoing certification sampling and analysis.

Action Levels

The applicable action levels are the on- and off-property soil FRLs published in the OU5 or OU2 ROD for each ASCOC.

Decision Rules

If the average concentration for each CU-specific COC is demonstrated to be below the FRLs within the agreed upon confidence level (95% for primary COCs; 90% for secondary COCs), and no analytical result exceeds two times the soil FRL, then the CU can be certified as complying with the cleanup criteria. If a CU does not meet the FRLs within the agreed upon confidence level for one or more CU-specific COCs, or one or more analytical results for one or more CU-specific COCs is greater than two times the associated soil FRL, then the CU fails certification and requires further assessment as per the SEP.

## 6.0 Limits on Decision Errors

### Types of Decision Errors and Consequences

Definition

Decision Error 1: This decision error occurs when the decision maker decides that a CU has met the certification criteria, when in reality, the certification criteria have not been met. This situation could result in an increased risk to human health and the environment. In addition, this type of error could result in regulatory fees and penalties.

Decision Error 2: This decision error occurs when the decision maker decides a CU does not met the certification criteria, when actually, the certification criteria have been met. This error would result in unnecessary added costs due to the excavation of soil containing COC concentrations below their FRLs, and an increased volume of soil assigned to the OSDF. In addition, unnecessary delays in the remediation schedule may result.

True State of Nature for the Decision Errors

The true state of nature for Decision Error 1 is that the certification criteria are not met (average CU-specific COC concentrations not below the FRL within the specified confidence limits; or a single sample result above two times the FRL). The true state of nature for Decision Error 2 is that certification criteria are met (average CU-specific COC concentrations are below the FRL within the specified confidence limits, and no result is above two times the FRL). Decision Error 1 is the more severe error due to the potential threat this poses to human health and the environment.

Null Hypothesis

$H_o$: The average concentration of at least one CU-specific COC within a CU is equal to or greater than the associated FRL.

$H_1$: The average concentration of all CU-specific COCs within a CU is less than the action levels.

False Positive and False Negative Errors

A false positive is Decision Error 1: less than or equal to five percent ($p = .05$) is considered the acceptable decision error in determination of compliance with FRLs for primary ASCOCs, while ten percent ($p = .10$) is acceptable for secondary ASCOCs.

A false negative is Decision Error 2: less than or equal to 20 percent is considered the acceptable decision error. This decision error is controlled through the determination of sample sizes (see Section G.1.4.1 of the final SEP).

## 7.0 Design for Obtaining Quality Data

Section 3.4.2 of the final SEP presents the specifics of the certification sampling design. The following text describes the general certification sampling design.

Soil Sample Locations

In order to select certification sampling locations, each CU is divided into 16 approximately equal sub-CUs. Certification sample locations are then generated by randomly selecting an easting and northing coordinate within the boundaries of each cell. Additional alternative sample locations are also generated in case the original random sample location fails the minimum distance criterion. The minimum distance criterion is defined as the minimum distance allowed between random sample locations in order to eliminate the chance of random sample points clustering within a small area. This clustering would tend to over emphasize a small area and, conversely, under represent a large area in certification determination. By not allowing sample locations to be too closely arranged, the sample locations are spread out and provide a more uniform coverage, thus reducing the possibility of large unsampled areas. The equation for determining minimum distance criterion is presented in Section 3.4.2.1 of the SEP.

In the event that the original random sample location failed the minimum distance criterion, the first alternate location was selected and all the locations were retested. This process continued until all 16 random locations passed the minimum distance criteria.

Each CU is also divided into four quadrants, each of which contains 4 sub-CUs and 4 sample locations. Three of the four locations per quadrant (12 per CU) are then selected for sample collection and analysis. The other one per quadrant (4 per CU) are designated as "archives", and samples will not be collected and analyzed unless need arises due to analytical or validation problems warrant. Per Section 3.4.2 of the SEP, as few as 8 samples may be collected from Group 2 CUs for analysis of secondary COCs.

Physical Samples

Physical soil certification samples will be collected from the surface according to SMPL-01 at locations identified in the PSP (generally 12 of the 16 locations per CU).

If stockpiled soil is to be certified, two CUs will be established, on for the stockpile and one for the underlying soil (i.e., the "footprint"). To certify the stockpile, samples will be collected from predetermined random intervals from within the stockpiled soil at each certification sampling location identified in the PSP. To certify the footprint, the first 6-inches of native soil present at each sampling location will also be collected for certification. If fill soil is to be certified, the strategy (surface or sampling at depth) will be based on results from the precertification scan of the fill area(s), as discussed in the Certification Design Letter and the certification PSP.

Laboratory Analysis

As defined in the PSP, a minimum of 8 to 12 samples per CU will be submitted to the on-site laboratory or a FDF approved off-site laboratory for analysis. All certification analyses will meet ASL D requirements per the SCQ except for the HAMDC. Samples will be analyzed for all CU-specific ASCOCs, with minimum detection levels set according to the SCQ and applicable project guidelines.

Validation

All field data will be validated. Also, a minimum of 10 percent of the analytical data from each laboratory will be subject to analytical validation to ASL D requirements in the SCQ, and will require an ASL D package. The remaining analytical data will be validated to a minimum of ASL B, and will require an ASL B package.

## 8.0 Use of Data to Test Null Hypothesis

Appendix G of the final SEP discusses in detail, the statistical evaluations of certification data used to determine attainment of certification criteria.

## Data Quality Objectives
## Sitewide Certification Sampling and Analysis

1A. Task Description:

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

RI☐ FS☐ RD☐ RA☒ RvA☐ Other (specify) _____

1C. DQO No.: SL-052, Rev. 2 DQO Reference No.: _____

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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 Ananlytical Support Level (A-E): (Put an X in the appropriate Analytical Support Level selection(s) beside each applicable data use)

| | |
|---|---|
| Site Characterization | Risk Assessment |
| A☐ B☐ C☐ D☐ E☐ | A☐ B☐ C☐ D☐ E☐ |
| Evaluation of Alternatives | Engineering Design |
| A☐ B☐ C☐ D☐ E☐ | A☐ B☐ C☐ D☐ E☐ |
| Monitoring During Remediation | Other |
| A☐ B☐ C☐ D☐ E☐ | A☐ B☐ C☐ D☒ E☐ |

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4A. Drivers: Remediation Area Remedial Action Work Plans, Applicable or Relevant and Appropriate Requirements (ARARs) and Operable Unit 2 and Operable Unit 5 Records of Decision (ROD), Sitewide Excavation Plan (SEP).

4B. Objective: Confirmation that remediation areas at the FEMP, or adjacent off-property areas, have met certification criteria on a CU by CU basis.

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5. Site Information (Description):

The OU2 and OU5 RODs have identified areas at the FEMP that require soil remediation activities. The RODs specify that the soil in these areas will be demonstrated to be below the FRLs. Certification is necessary for all FEMP soil and some adjacent off-property soil to demonstrate that the residual soil does not contain COC contamination exceeding the FRL at a specified confidence level.

---

6A. 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 | ☐ | 2. Uranium | ☒* | 3. BTX | ☐ |
| Temperature | ☐ | Full Radiological | ☒* | TPH | ☐ |
| Specific Conductance | ☐ | Metals | ☒* | Oil/Grease | ☐ |
| Dissolved Oxygen | ☐ | Cyanide | ☐ | | |
| Technetium-99 | ☒* | Silica | ☐ | | |
| 4. Cations | ☐ | 5. VOA | ☒* | 6. Other (specify) | |
| Anions | ☐ | BNA | ☐ | | |
| TOC | ☐ | PEST | ☒* | | |
| TCLP | ☐ | PCB | ☒* | | |
| CEC | ☐ | COD | ☐ | | |

• As identified in the area certification PSP

6.B. Equipment Selection and SCQ Reference:

| | Equipment Selection | | Refer to SCQ Section |
|---|---|---|---|
| ASL A | | SCQ Section | |
| ASL B | | SCQ Section | |
| ASL C | | SCQ Section | |
| ASL D | Per SCQ and PSP | SCQ Section | Appendix G, Tbls. 1&3 |
| ASL E | Per PSP | SCQ Section | Appendix H (final) |

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

Biased☐ Composite☐ Grab☒ Environmental☐ Grid☐
Intrusive☒ Non-Intrusive☐ Phased☐ Source☐ Random☒•
*Systematic random samples, selected one per cell and meeting the minimum distance criterion

7B. Sample Work Plan Reference: Project Specific Plan for the associated Remediation area Remedial Action Work Plan

Background samples: OU5 RI

7C. Sample Collection Reference: Associated PSP(s), SMPL-01

8. Quality Control Samples: (Put an X in the appropriate selection.)

8A. Field Quality Control Samples:

| | | | |
|---|---|---|---|
| Trip Blanks | ☒[1] | Container Blanks | ☒ |
| Field Blanks | ☒[2] | Duplicate Samples | ☒ |
| Equipment Rinsate Blanks | ☒ | Split Samples | ☒[3] |
| Preservative Blanks | ☐ | Performance Evaluation Samples | ☐ |

Other (specify) _____

1) Collected for volatile organic sampling
2) As noted in the PSP
3) Split samples will be taken where required by the EPA

8B. Laboratory Quality Control Samples:

| | | | |
|---|---|---|---|
| Method Blank | ☒ | Matrix Duplicate/Replicate | ☒ |
| Matrix Spike | ☒ | Surrogate Spikes | ☒ |
| Tracer Spike | ☒ | Other (specify) _____ | |

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

Sample density will be dependent upon the CU size (Group 1 [250'x250'] or Group 2 [500'x500']), as determined by historical and pre-certification scan data.

# APPENDIX B

## PRECERTIFICATION REAL-TIME SCAN DATA FOR AREA 1, PHASE IV - DECONTAMINATION FACILITY AREA

**TABLE B-1**
**AREA 1, PHASE IV - DECONTAMINATION FACILITY AREA PHASE 2 - HPGE RESULTS DETECTOR HEIGHT 31 cm**

| Location ID | Measurement Date | Northing | Easting | Detector Height (cm) | Ra-226 (pCi/g) | Th-232 (pCi/g) | Total U (ppm) |
|---|---|---|---|---|---|---|---|
| OSDF-P2-5265 | 16Sep061 | 479608 | 1350731 | 31 | 2.06 | 0.999 | 17.3 |
| A1P2-P2-5649 | 08Oct061 | 479643 | 1350784 | 31 | 2.851 | 0.521 | 7.15E-02 |
| A1P2-P2-5649-D | 08Oct061 | 479643 | 1350784 | 31 | 2.707 | 0.465 | 14.1 |
| A1P4-P2-5983 | 25Oct061 | 479576 | 1350811 | 31 | 2.2 | 1.04 | 23.8 |
| A1P4-P2-5983-D | 25Oct061 | 479576 | 1350811 | 31 | 2.52 | 1.1 | 31.8 |
| A1P4-P2-5984 | 25Oct061 | 479548 | 1350757 | 31 | 2.19 | 0.961 | 20.1 |
| A1P4-P2-5985 | 25Oct061 | 479481 | 1350675 | 31 | 1.92 | 0.729 | 19.3 |



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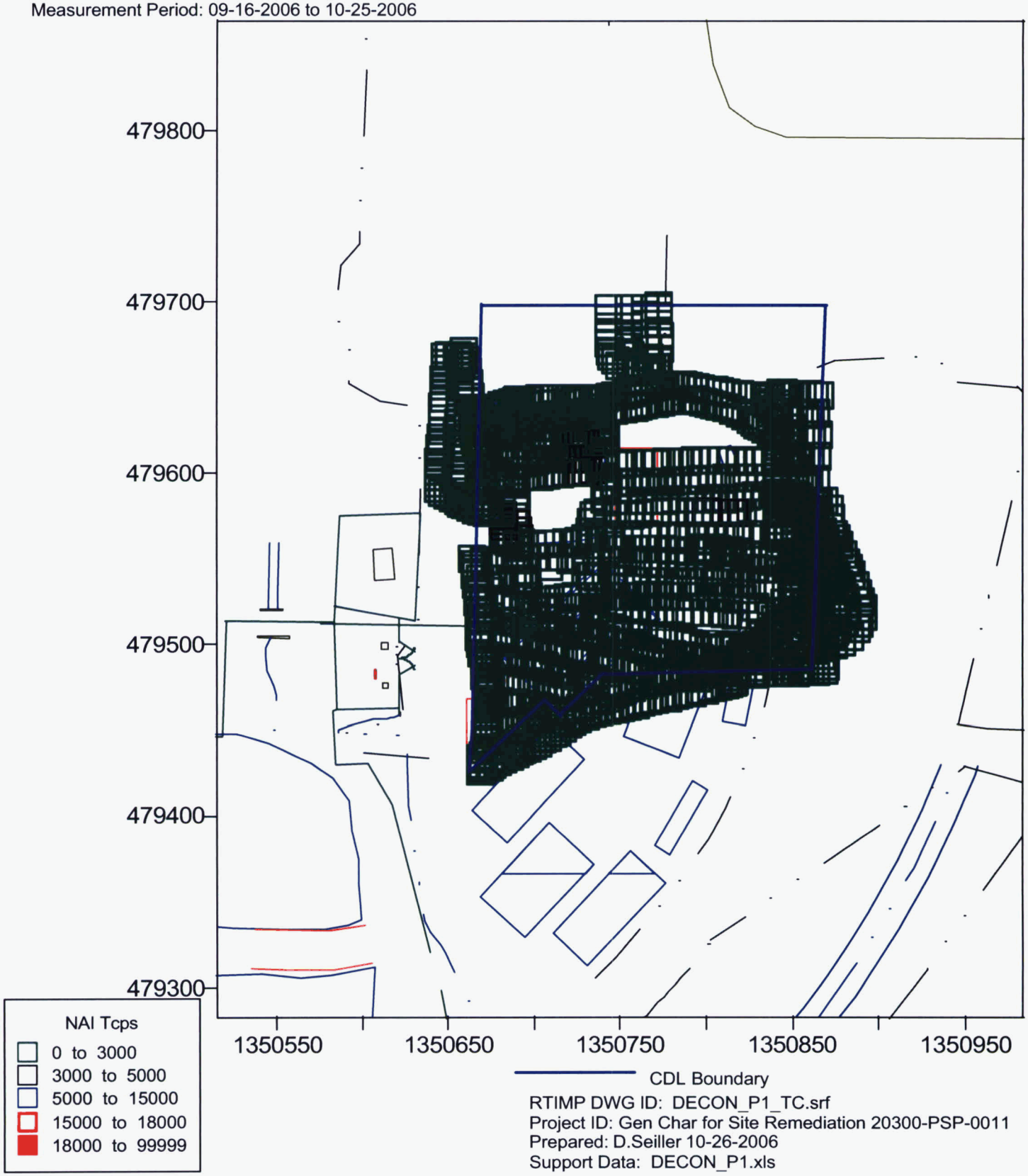
# Figure B-1 Area1, Phase IV - Decontamination Facility Area Phase 1
## Total Gross Counts per Second

Data Groups: RSS1_2936-10-06-2006,2987_10-25-2006
RSS3_1777_10-25-2006
RSS4_1606_09-16-2006
GATOR_1099_09-17-2006
31265_09-16-2006

Measurement Period: 09-16-2006 to 10-25-2006




RTIMP DWG ID: DECON_P1_TC.srf
Project ID: Gen Char for Site Remediation 20300-PSP-0011
Prepared: D.Seiller 10-26-2006
Support Data: DECON_P1.xls

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# Figure B-2 Area1, Phase IV - Decontamination Facility Area Phase 1
# Moisture Corrected Radium-226

Data Groups: RSS1_2936-10-06-2006,2987_10-25-2006
RSS3_1777_10-25-2006
RSS4_1606_09-16-2006
GATOR_1099_09-17-2006
31265_09-16-2006

Measurement Period: 09-16-2006 to 10-25-2006

| NAI Ra-226 pCi/g | HPGe Ra-226 pCi/g |
|---|---|
| -9999 to 5.1 | -999 to 5.1 |
| 5.1 to 9999 | 5.1 to 999 |

CDL Boundary

RTIMP DWG ID: DECON_P1_RA.srf
Project ID: Gen Char for Site Remediation 20300-PSP-0011
Prepared: D.Seiller 10-26-2006
Support Data: DECON_P1.xls

# Figure B-3 Area1, Phase IV - Decontamination Facility Area Phase 1
# Moisture Corrected Thorium-232

Data Groups: RSS1_2936-10-06-2006,2987_10-25-2006
RSS3_1777_10-25-2006
RSS4_1606_09-16-2006
GATOR_1099_09-17-2006
31265_09-16-2006

Measurement Period: 09-16-2006 to 10-25-2006

| NAI Th-232 pCi/g | HPGe Th-232 pCi/g |
|---|---|
| -9999 to 4.5 | -999 to 4.5 |
| 4.5 to 9999 | 4.5 to 999 |

CDL Boundary

RTIMP DWG ID: DECON_P1_TH.srf
Project ID: Gen Char for Site Remediation 20300-PSP-0011
Prepared: D.Seiller 10-26-2006
Support Data: DECON_P1.xls

# Figure B-4 Area1, Phase IV - Decontamination Facility Area Phase 1
# Moisture Corrected Total Uranium

Data Groups: RSS1_2936-10-06-2006,2987_10-25-2006
RSS3_1777_10-25-2006
RSS4_1606_09-16-2006
GATOR_1099_09-17-2006
31265_09-16-2006

Measurement Period: 09-16-2006 to 10-25-2006

| NAI TU ppm | HPGe TU ppm |
|---|---|
| -9999 to 246 | -999 to 246 |
| 246 to 9999 | 246 to 999 |

CDL Boundary

RTIMP DWG ID: DECON_P1_TU.srf
Project ID: Gen Char for Site Remediation 20300-PSP-0011
Prepared: D.Seiller 10-26-2006
Support Data: DECON_P1.xls

# Figure B-5 Area1, Phase IV - Decontamination Facility Area Phase 2
# Moisture Corrected Radium-226

Data Groups: 30699_10-08-2006
31265_09-16-2006
40227_10-25-2006

Measurement Period: 09-16-2006 to 10-25-2006

HPGe Ra-226 pCi/g
-999 to 5.1
5.1 to 999

CDL Boundary

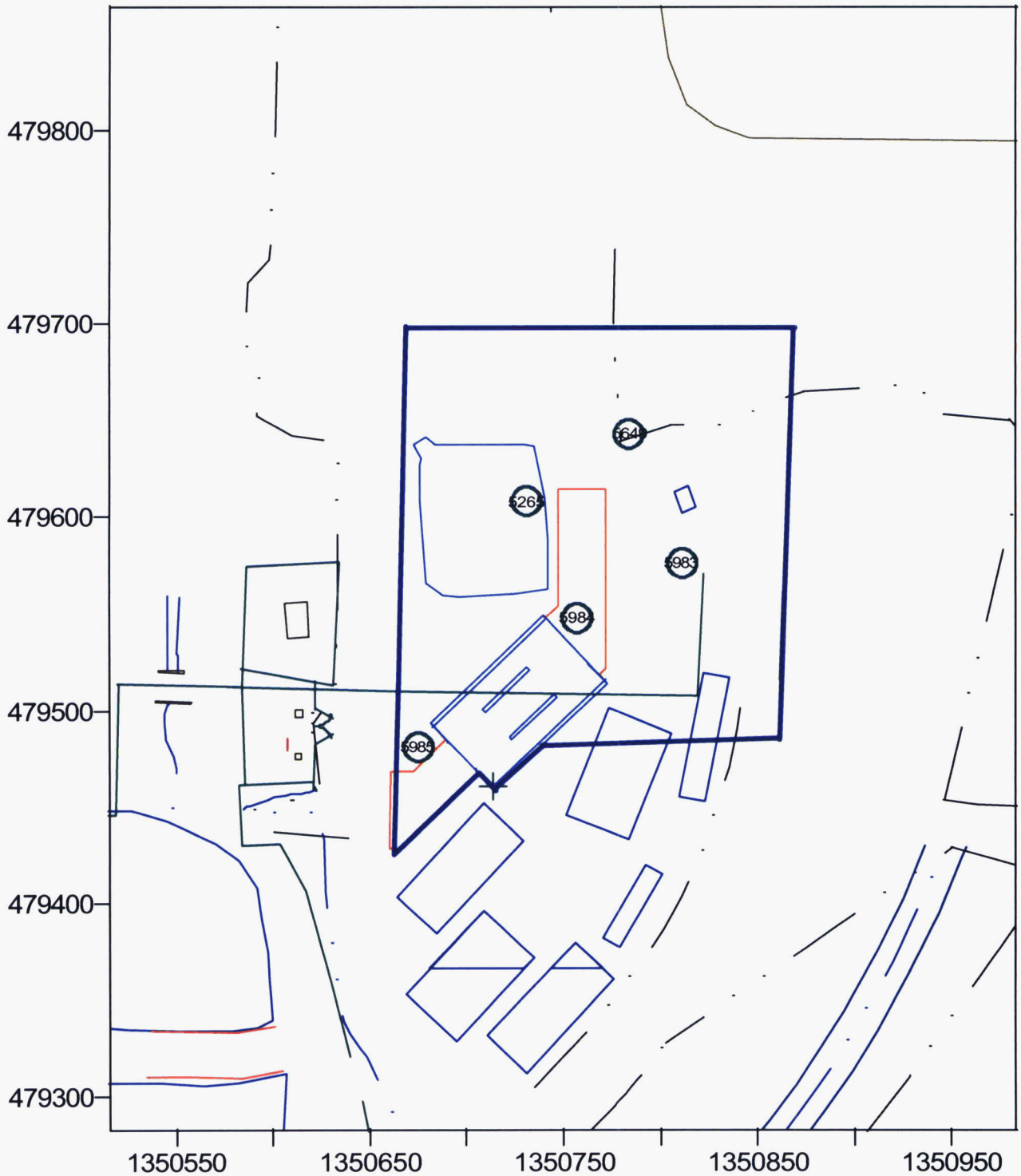
RTIMP DWG ID: DECON_P2_RA.srf
Project ID: Gen Char for Site Remediation 20300-PSP-0011
Prepared: D.Seiller 10-26-2006
Support Data: DECON_P2.xls

006228

# Figure B-6 Area1, Phase IV - Decontamination Facility Area Phase 2 Moisture Corrected Thorium-232

Data Groups: 30699_10-08-2006
31265_09-16-2006
40227_10-25-2006

Measurement Period: 09-16-2006 to 10-25-2006




HPGe Th-232 pCi/g
-999 to 4.5
4.5 to 999

CDL Boundary

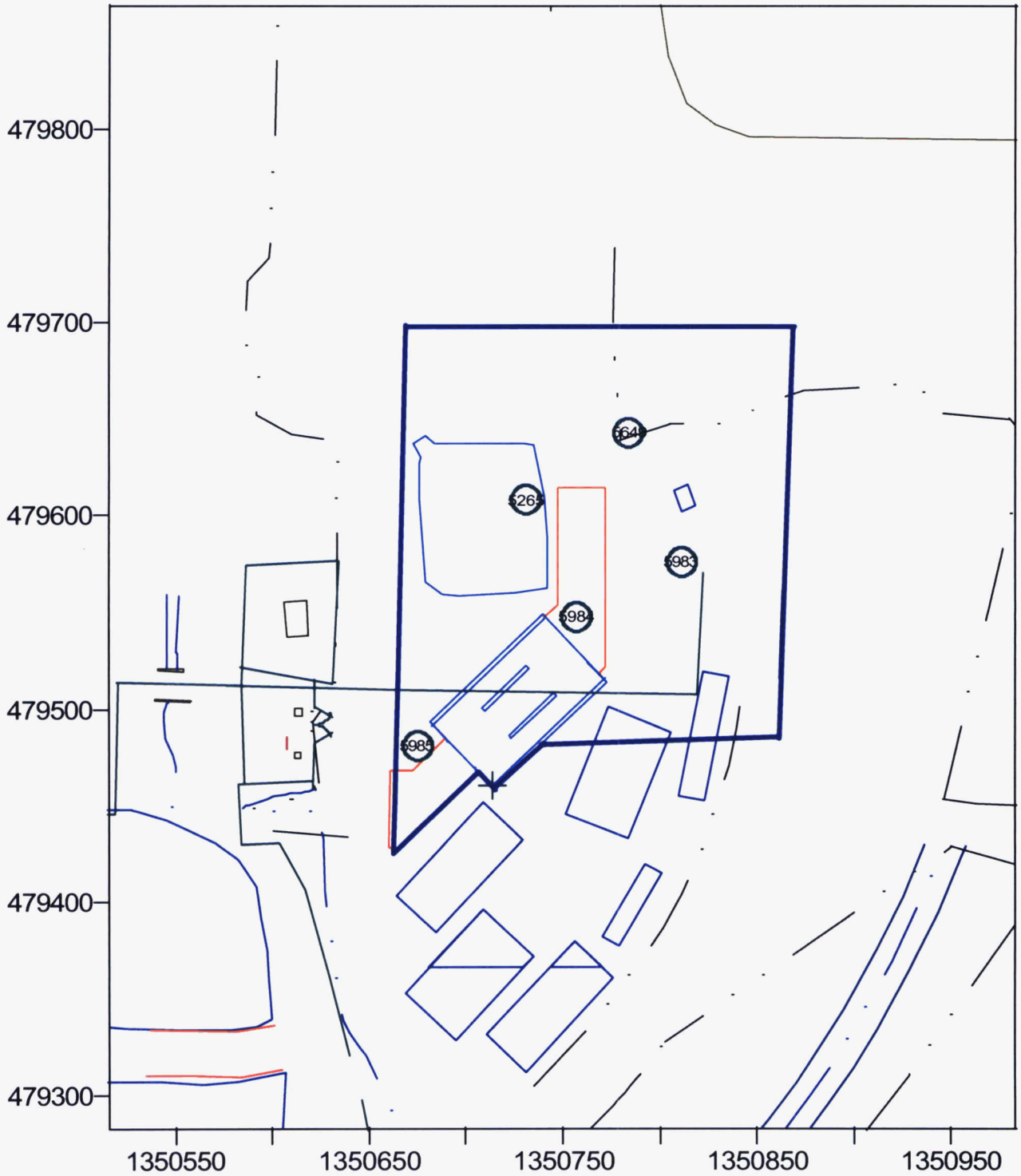
RTIMP DWG ID: DECON_P2_TH.srf
Project ID: Gen Char for Site Remediation 20300-PSP-0011
Prepared: D.Seiller 10-26-2006
Support Data: DECON_P2.xls

822900

# Figure B-7 Area1, Phase IV - Decontamination Facility Area Phase 2
# Moisture Corrected Total Uranium

Data Groups: 30699_10-08-2006
31265_09-16-2006
40227_10-25-2006

Measurement Period: 09-16-2006 to 10-25-2006




HPGe TU ppm
-999 to 246
246 to 999

CDL Boundary

RTIMP DWG ID: DECON_P2_TU.srf
Project ID: Gen Char for Site Remediation 20300-PSP-0011
Prepared: D.Seiller 10-26-2006
Support Data: DECON_P2.xls

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# APPENDIX C

## AREA 1, PHASE IV - DECONTAMINATION FACILITY AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

# APPENDIX C
# AREA 1, PHASE IV - DECONTAMINATION FACILITY AREA CERTIFICATION SAMPLE LOCATIONS AND IDENTIFIERS

| CU | Location | Depth | Sample ID | TAL | North-83 | East-83 |
|---|---|---|---|---|---|---|
| 5 | 5-1 | 0"-6" | A1P4-C05-1^RMPS | ABCD | 479596.14 | 1350775.25 |
| | | | A1P4-C05-1^L | E | | |
| | 5-2 | 0"-6" | A1P4-C05-2^RMPS | ABCD | 479550.91 | 1350799.21 |
| | | | A1P4-C05-2^L | E | | |
| | 5-3 | 0"-6" | A1P4-C05-4^RMPS | ABCD | 479569.7 | 1350840.38 |
| | | | A1P4-C05-4^L | E | | |
| | 5-4D | 0"-6" | A1P4-C05-4^RMPS | ABCD | 479522.72 | 1350838.59 |
| | | | A1P4-C05-4^RMPS-D | | | |
| | | | A1P4-C05-4^L | E | | |
| | | | A1P4-C05-4^L-D | | | |
| | 5-5 | 0"-6" | A1P4-C05-5^RMPS | ABCD | 479665.46 | 1350704.34 |
| | | | A1P4-C05-5^L | E | | |
| | 5-6 | 0"-6" | A1P4-C05-6^RMPS | ABCD | 479681.12 | 1350759.38 |
| | | | A1P4-C05-6^L | E | | |
| | 5-7 | 0"-6" | A1P4-C05-7^RMPS | ABCD | 479603.26 | 1350675.7 |
| | | | A1P4-C05-7^L | E | | |
| | 5-8 | 0"-6" | A1P4-C05-8^RMPS | ABCD | 479544.19 | 1350698.97 |
| | | | A1P4-C05-8^L | E | | |
| | 5-9 | 0"-6" | A1P4-C05-09^RMPS | ABCD | 479610.87 | 1350734.77 |
| | | | A1P4-C05-09^L | E | | |
| | 5-10 | 0"-6" | A1P4-C05-10^RMPS | ABCD | 479676.2 | 1350809.95 |
| | | | A1P4-C05-10^L | E | | |
| | 5-11 | 0"-6" | A1P4-C05-11^RMPS | ABCD | 479680.72 | 1350850.16 |
| | | | A1P4-C05-11^L | E | | |
| | 5-12 | 0"-6" | A1P4-C05-12^RMPS | ABCD | 479637.48 | 1350859.84 |
| | | | A1P4-C05-12^L | E | | |
| | 5-13 | 0"-6" | A1P4-C05-13^RMPS | ABCD | 479559.27 | 1350742.39 |
| | | | A1P4-C05-13^L | E | | |
| | 5-14 | 0"-6" | A1P4-C05-14^RMPS | ABCD | 479517.43 | 1350723.72 |
| | | | A1P4-C05-14^L | E | | |
| | 5-15 | 0"-6" | A1P4-C05-15^RMPS | ABCD | 479483.62 | 1350726.99 |
| | | | A1P4-C05-15^L | E | | |
| | 5-16 | 0"-6" | A1P4-C05-16^RMPS | ABCD | 479499.45 | 1350780.86 |
| | | | A1P4-C05-16^L | E | | |