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CERTIFICATION DESIGN LETTER FOR AREA 1, PHASE II SECTOR 2B

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

INFORMATION ONLY

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U.S. DEPARTMENT OF ENERGY
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LIST OF ACRONYMS AND ABBREVIATIONS

A1PII	Area 1, Phase I
A1PII	Area 1, Phase II
A1PII-S2B	Area 1, Phase II Sector 2B
ASCOC	area-specific constituent of concern
ASL	analytical support level
CDL	Certification Design Letter
COC	constituent of concern
CU	certification unit
CRDL	Contract Required Detection Limit
EIS	East Impacted Stockpile
FEMP	Fernald Environmental Management Project
FRL	final remediation level
mg/kg	milligram per kilogram
NAR	North Access Road
OSDF	On-site Disposal Facility
OU5	Operable Unit 5
pCi/g	picocuries per gram
ppm	parts per million
PSP	Project Specific Plan
ROD	Record of Decision
RTRAK	Radiation Tracking System
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
UCL	Upper Confidence Limit
WAC	Waste Acceptance Criteria

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EXECUTIVE SUMMARY

This Certification Design Letter (CDL) describes the certification approach for Area 1, Phase II, Sector 2B (A1P2-S2B) and includes the following information:

- A definition of the boundaries of the area to be certified under the guidance of this CDL
- Presentation of newly acquired precertification real-time data
- A discussion of the area-specific constituent of concern (ASCOC) selection process and list of ASCOCs assigned to A1PII-S2B.
- A presentation of the certification unit (CU) boundaries and proposed sampling strategy
- The analytical requirements and the statistical methodology that will be employed
- The proposed schedule for certification activities.

The scope of this CDL is limited to A1PII-S2B, which is an approximately 1.5 acre parcel located in the northern portion of A1PII. A1PII-S2B includes the former East Impacted Stockpile (EIS) footprint and the adjacent portion of the North Access Road and ditches. This portion of the FEMP property is being certified to accommodate the On-Site Disposal Facility (OSDF) schedule for construction of Cell 3.

The only remedial action which has occurred in the area is the removal of the EIS and six inches below original grade.

The certification design presented in this CDL follows the general approach outlined in Section 3.4 of the Sitewide Excavation Plan (SEP) (DOE 1998a). Since the area is contiguous with the Area I, Phase I (A1PI) certified area, the same list of area-specific constituents of concern (ASCOCs) will be used as A1PI. The selection process for A1PI ASCOCs was accomplished using constituent of concern (COC) lists in the Operable Unit 5 (OU5) Record of Decision (ROD) (DOE 1996), process knowledge of the site COCs and release history. The field work is scheduled to begin on February 22, 1999, and the Certification Report will be issued March 31, 1999.

1.0 INTRODUCTION

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This Certification Design Letter (CDL) describes the certification approach for demonstrating that soil in Area 1, Phase II Sector 2B (A1PII-S2B) meets the final remediation levels (FRLs) for all applicable ASCOCs. The format of this CDL follows guidelines presented in the Sitewide Excavation Plan (SEP) and, accordingly, consists of six sections:

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

2.0 Precertification Data - Presentation and discussion of precertification real-time scanning data

3.0 Area-Specific Constituents of Concern (ASCOCs) - Discussion of selection criteria and selected ASCOCs for A1PII-S2B

4.0 Certification Units (CUs) - Presentation of design, sampling and analytical methodologies

5.0 Schedule

6.0 References

As discussed in the A1PII Supplemental Characterization Package, submitted February 12, 1999, A1PII certification will be performed in an iterative manner, i.e., areas within sectors will be certified in phases. In order to track the certification progress, three CDLs will be submitted to the regulatory agencies. Table 1-1 summarizes all the CDLs that will be submitted for A1PII.

Once the entire area is certified, a complete Certification Report for the entire area will be submitted, including the CUs discussed in this CDL. However, in order to proceed with construction activities in this areas covered in this CDL, an Certification Report for this CDL will be submitted which will include the data summaries, and documentation of any field changes.

The FEMP Certification Master Control Map (Figure 1) is included in all CDLs and Certification Reports in order to track status of certification.

1.1 OBJECTIVES

The primary objectives of this CDL are to:

- Define the boundaries of the area to be certified under the guidance of this CDL

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- Present newly acquired real-time data in the form of data maps of the area proposed for certification
- Define the ASCOC selection process and list the selected ASCOCs for those areas
- Present the CU boundaries and proposed sampling strategy
- Summarize the analytical requirements and the statistical methodology that will be employed
- Present the proposed schedule for the

1.2 SCOPE

The scope of this CDL is limited to A1PII-S2B. As shown on Figure 2, A1PII-S2B includes the footprint of the former East Impacted Stockpile (EIS) and the adjacent portion of the former North Access Road.

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TABLE 1-1
A1PII CERTIFICATION DESIGN LETTERS

CDL – Scope	CDL Submittal	Certification Report
Sector 1, Sector 2A, Conveyance Ditch	COMPLETE	COMPLETE
Sector 2B - CURRENT CDL	2/18/99	3/31/99
Sector 1B, Sector 2C and 2D, and Sector 3	10/31/99	12/31/99 – Complete Report

2.0 HISTORICAL AND PRECERTIFICATION DATA

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, in accordance with the SEP. The Operable Unit 5 (OU5) Record of Decision (ROD) also commits the Fernald Environmental Management Project (FEMP) to removing any man-made objects, including debris, building foundations, and drainage systems, before a remediation area can be certified. However, there are no such objects within A1PII-S2B. Historical data from this area are not relevant to this CDL because it is a former stockpile location which has been excavated. Once the EIS area was excavated to the original grade, it was scanned using the Radiation Tracking System (RTRAK). The RTRAK scan did not show any contamination approaching the Waste Acceptance Criteria (WAC), and an additional six inches was excavated. The highest pre-excavation RTRAK total uranium reading using a two point average was 108 mg/kg. Once the six inches was excavated, a real-time precertification scan of the area was planned on the post-excavation footprint. However, field conditions have been too wet to allow any additional real-time monitoring. Since the pre-excavation scan showed limited contamination approaching the FRL prior to the excavation, and this certification effort is a critical path activity to the OSDF schedule, certification sampling will proceed without the precertification real-time scan. However, the scan will be performed once the area has sufficiently dried. The results of this scan will be discussed in the Certification Report for this area.

3.0 AREA-SPECIFIC CONSTITUENTS OF CONCERN

For the CUs within the scope of this CDL, the ASCOCs will be the same those identified for the Area 1 Phase I (A1PI) certified area. The selection process for these ACSOSs is discussed in the OU5 ROD. There are 80 soil COCs with established FRLs which 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 Remedial Investigation/Feasibility Study data presented on spatial distribution maps, the sitewide list of soil COCs 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 on site 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 used in 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 A1PII-S2B ASCOC if:

- It is listed as a soil COC in the OU5 ROD
- It can be traced to site use, either through process knowledge or known release of the constituent to the environment
- Analytical results indicate the contaminant is present at a concentration 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.

- The contaminant is one of the sitewide primary COCs (total uranium, radium-226, radium-228, thorium-232, and thorium-228).

Using this process, the ASCOCs for the A1PII-S2B CUs were identified and are listed in Table 3-1.

TABLE 3-1
ASCOC LIST FOR ALL A1PII-S2B CUs

ASCOC	FRL	Reason Retained
Total Uranium	82 mg/Kg	Retained as a primary ASCOC sitewide
Radium-226	1.7 pCi/g	Retained as a primary ASCOC sitewide
Radium-228	1.8 pCi/g	Retained as a primary ASCOC sitewide
Thorium-228	1.7 pCi/g	Retained as a primary ASCOC sitewide
Thorium-232	1.5 pCi/g	Retained as a primary ASCOC sitewide
Arsenic	12 mg/kg	Retained as a secondary ASCOC due to A1PI CU Failure

4.0 CERTIFICATION APPROACH

4.1 CERTIFICATION DESIGN

The certification design for A1PII-S2B follows the general approach outlined in Section 3.4 of the SEP. Because A1PII-S2B included shallow excavation of impacted soil, Approach A from the SEP will be used as a basis for certification design, as described in Section 4.1 of the SEP. Three Group 1 CUS, which can be as large as 62,500 square feet, and one Group 2 CU, which can be as large as 250,000 square feet, have been located within A1PII-S2B as follows:

- **CU A1PII-S2B-NAR1** - established to cover the soil beneath the paved portion of the North Access Road in the northern portion of A1PII-S2B.
- **CU A1PII-S2B-NAR2** - established to cover the soil beneath the paved portion of the North Access Road in southern portion of A1PII-S2B.
- **CU A1PII-S2B-NAR3** - established to cover the ditch along the west side of the North Access Road to the southern part of the certified area, and the ditch on the east side of the NAR in northern portion of A1PII-S2B. Since the NAR ditches receive run-off from the NAR and uncertified areas, this CU consists only of areas which receive run-off from certified areas. Also, since this CU is not contiguous all 16 samples will be collected and analyzed.
- **CU A1PII-S2B-EIS** - established to contain the footprint of the EIS.

Figure 2 shows the location and boundaries of these four CUS. Certification sampling locations were selected in accordance with 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 and testing the locations against the minimum distance criterion for the CU. If a sample failed the minimum distance criterion, an alternative random location was selected for that sub-CU, and all the locations were re-tested. This process continued until all 16 random locations met the minimum distance criterion.

For CU A1PII-S2B-NAR3 the process was selecting the sample locations was different since the CU is not contiguous. The 16 samples locations were allocated between the ditches (east of the NAR and west of the NAR) based on the respective lengths, with the west ditch should receiving 5 sample locations and the east 11. The process for selecting the northing coordinate was as follows:

- The northing coordinate is a fixed distance random start coordinate. The length of the ditch calculated by subtracting the the northing coordinate of the mid-point of the ditch southern edge

from the mid-point at the northern edge. This was done for separately for each ditch.

- This distance was then divided by the number of samples to be taken (5 in the west disch, 11 in the east). This gives the legnth (in the northing direction) of each sub-CU.
- From the southern most sub-CU in each ditch a random northing coordinate is generated. This is value was used as an off-set for all of the other respective sub-CUs. For example, the random northing was 15 feet from the southern boundary of the sub-CU, each additional sub-CU will be sampled at a location 15 feet from it's southern boundary. This provides an even distribution of samples.

For the easting coordinate the process was as follows:

- The ditches are approximately straight at these intervals. A center line was defined from southern mid-point to northern mid-point.
- By using the Northing coordinate generated above, the Easting coordinate was calculated at the of the center line at that Northing. For each of these Eastings coordinates a random generated off-set was determined based on the maximum width of the ditch. This is essentially a random number (from 0 to 1) times the max width minus ½ the max width. This number was added to the calculated center line. This number can be either positive or negative. A positive offset moves the location east and a negative moves the location west.

Once the Northing and Easting coordinates were determined the random locations were overlayed on a CU map of the ditches. If the random easting fell outside the CU boundaries (because the ditches are not constant width) then a random number was generated between 0 and 4 was generated as a 'corrective' offset. (i.e. to move the east or west to put the sample location back inside the CU.)

In summary, :the northing coordinate is a fixed distance random start location, and the easting coordinate is a random location withing the width of the ditch.

As discussed in the Project Specific Plan (PSP) for Certification Sampling of Area 1, Phase II Sector 2B (DOE 1998d), discrete soil samples will be collected from each of the 16 random sampling locations. Each sample will be collected from the 0 to 6-inch (surface) soil interval at the designated and surveyed sample point. Samples collected from A1PII-S2B-NAR01 and A1PII-S2B-NAR02 will consist of native soil from beneath the North Access Road pavement. These samples will be collected by drilling through the pavement until the surface of the native soil is reached. Of the 16 certification samples, a total of 12 will be submitted for analysis, with the exception of CU A1P2-S2B-NAR3 where

all the samples will be analyzed. In the other three CUs the 12 samples to be analyzed were selected by dividing each CU into quadrants with each quadrant containing four sample locations. Three of the four samples from each quadrant were then randomly selected for analysis, resulting in a total of 12 samples analyzed per CU. The other four samples from each CU are to be archived and analyzed only if necessary.

4.2 ANALYTICAL METHODOLOGY AND STATISTICAL ANALYSIS

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) E, where all requirements are the same as ASL D except the minimum detection level for the selected analytical method must be at least 10 percent of FRL. One of the four CUS will be validated to ASL D. Samples rejected during this validation will be reanalyzed, or an archive sample may be substituted if there is insufficient material available from the initial sample. If any sample fails this validation, all data from the laboratory with the rejected result will then be validated to determine the integrity of all data from that laboratory. Once data are validated, results will be entered into the Sitewide Environmental Database (SED), and a statistical analysis will be performed to evaluate the pass/fail criteria for the each CU. The statistical approach is discussed in Section 3.4.3 and Appendix G of the SEP.

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 COC to its FRL. On an individual CU basis, any ASCOC with the 95 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 second criterion. The second criterion is related to the two-times the FRL (2xFRL) hot spot criterion. A CU will fail certification if a single total uranium, thorium-232, or radium-226 result exceeds 2xFRL. When the given UCL on the mean for each COC is less than its FRL, and the 2xFRL 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 all CUs within

the scope of this CDL have passed certification, a Certification Report will be issued. The Certification Report will be submitted to the regulatory agencies to receive acknowledgment that the pertinent operable unit remedial actions were completed and the individual CUs are certified 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.

5.0 SCHEDULE

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

ACTIVITY	TARGET DATE
Submittal of Certification Design Letter	February 19, 1999
Start of Field Work	February 22, 1999
Complete Field Work	February 26, 1999
Complete Analytical Work	March 26, 1999
Complete Data Validation and Statistical Analysis	March 29, 1999
Submit Certification Report	March 31, 1999

* Only the dates for submittal of the Certification Design Letter and Certification Report are commitments to the OEPA and EPA. Other dates are internal target completion dates.

REFERENCES

U. S. Department of Energy, 1996, "Record of Decision for Remedial Action at Operable Unit 5," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U. S. Department of Energy, 1998a, "Sitewide Excavation Plan," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U. S. Department of Energy, 1998b, "User Guidelines, Measurement Strategies, and Operational Factors for Deployment of In-Situ Gamma Spectrometry at the Fernald Site," Draft, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U. S. Department of Energy, 1998c, "In-Situ Gamma Spectrometry QA/QC Program," Draft, Appendix H of the Sitewide CERCLA Quality Assurance Project Plan, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U. S. Department of Energy, 1998d, "Project Specific Plan for Area 1, Phase II Sector 2B Certification Sampling," Draft, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

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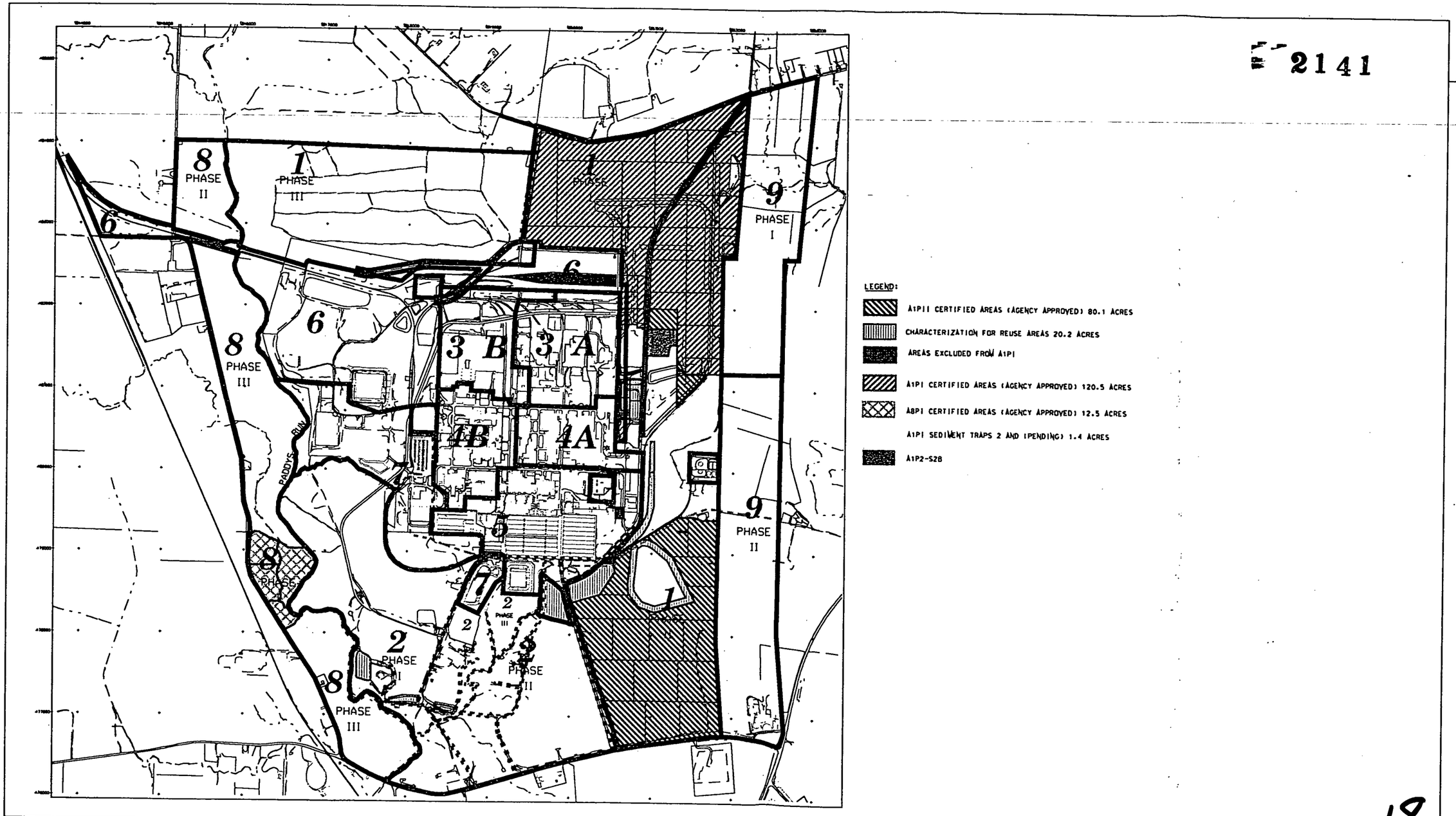

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FIGURE 1. FEMP CONTROLLED CERTIFICATION MASTER MAP

FIGURE 2. A1PII-S2B CERTIFICATION UNITS AND SAMPLE LOCATIONS