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CERTIFICATION REPORT FOR AREA 1, PHASE IV PARTS TWO AND THREE

FERNALD CLOSURE PROJECT
FERNALD, OHIO

AUGUST 2004

U.S. DEPARTMENT OF ENERGY

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LIST OF ACRONYMS AND ABBREVIATIONS

A1PIV	Area 1, Phase IV
ASCOC	area-specific constituent of concern
ASL	analytical support level
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	constituent of concern
CU	certification unit
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FCP	Fernald Closure Project
FRL	final remediation level
HAMDC	highest allowable minimum detectable concentration
HPGe	high-purity germanium (detector)
MDC	minimum detectable concentration
mg/kg	milligrams per kilogram
NaI	sodium iodide
OEPA	Ohio Environmental Protection Agency
OSDF	On-Site Disposal Facility
OU	Operable Unit
PCB	polychlorinated biphenyl
pCi/g	picoCuries per gram
PSP	Project Specific Plan
QA/QC	Quality Assurance/Quality Control
RI/FS	Remedial Investigation/Feasibility Studies
ROD	Record of Decision
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
TPU	Total Propagated Uncertainty
TSCA	Toxic Substances Control Act
UCL	Upper Confidence Level
V&V	verification and validation
VOC	volatile organic compound

EXECUTIVE SUMMARY

This certification report presents the information and data used by the U.S. Department of Energy (DOE) to determine that existing soil concentrations within Area 1, Phase IV (A1PIV) Part Two and A1PIV Part Three meet established final remediation levels (FRLs). A1PIV Parts Two and Three, shown on figure 1-1, are both located southeast of the Former Production Area and are radiologically clean areas (not radiologically controlled). The certification efforts for each area were carried out under separate certification design letters and project specific plans, but the information and data related to these efforts are being consolidated and presented in one certification report. On the basis of this reported information, it has been determined that no further remedial actions are necessary in either A1PIV Part Two or A1PIV Part Three. Upon approval from the U.S. Environmental Protection Agency and Ohio Environmental Protection Agency, DOE intends to proceed with future land use activities.

Certification samples from A1PIV Parts Two and Three were collected in June 2004. All samples were analyzed at off-site laboratories from the Fernald Closure Project (FCP) Approved Laboratories List per the Sitewide Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ, DOE 2002a). All samples were analyzed and reported at the required analytical support level (ASL). The data were subjected to the required validation and verification process, which did not identify any quality concerns.

One sample location in certification unit (CU) 4, A1P4-C4-13, had elevated aroclor-1254 and aroclor-1260 results; the results, however, were not greater than twice the FRL (the hotspot criterion). All other aroclor-1254 and aroclor-1260 sample results for CU 4 were below the FRL, and subsequent statistical analysis showed the CU passed certification.

DOE has restricted access to certified areas in order to maintain their integrity prior to final land use development. An FCP procedure (EP-0008) has been developed to implement a process to protect certified areas from becoming recontaminated.

1.0 INTRODUCTION

1.1 PURPOSE

This Certification Report presents the process and data used by the U.S. Department of Energy (DOE) to determine that soils in Area 1, Phase IV (A1PIV) Parts Two and Three do not contain any constituents which exceed established final remediation levels (FRLs) and therefore do not require remediation. This report presents the final certification results for the certification units (CU) identified in the A1PIV Part Two Certification Design Letter (CDL, DOE 2004a) and A1PIV Part Three Certification Design Letter (DOE 2004b).

1.2 BACKGROUND

In the Operable Unit (OU) 5 Record of Decision (ROD, DOE 1996a), DOE committed to excavating contaminated soil that exceeds health-based FRLs, with final disposal of the excavated material in the On-Site Disposal Facility (OSDF) or an off-site disposal facility if the waste acceptance criteria are exceeded. The OU5 Remedial Investigation Report (DOE 1995a) defined the potential extent of soil contamination exceeding the FRLs and, in general, indicated widespread contamination in approximately 430 acres of the 1,050-acre Fernald Closure Project (FCP).

In the OU5 Remedial Action Work Plan (DOE 1996b), DOE committed to preparing a Sitewide Excavation Plan (SEP, DOE 1998a), defining the overall approach to implementing the soil, and at- and below-grade debris cleanup obligations identified in the OU2 (DOE 1995b), OU3 (DOE 1996c), and OU5 RODs. In the SEP, the FCP was divided into ten remedial areas; this report addresses A1PIV.

1.3 AREA DESCRIPTION AND SCOPE

Certification of A1PIV Parts Two and Three is necessary for construction of the OSDF Cell 8 and Valve House 8. A1PIV Parts Two and Three, shown on Figure 1-1, are both located southeast of the Former Production Area and are radiologically clean areas (not radiologically controlled). A1PIV Part Two has been, until recently, considered part of the Area 5 Administrative Side. A gravel parking lot was maintained in the area to facilitate worker parking and also serve as a staging area for outbound tractor-trailers waiting to be shipped for off-site disposal. A1PIV Part Three, located just northwest of Part Two, has been considered part of the Area 7 Administrative Side. Due to its proximity to A1PIV as well as the impact on the area for the OSDF Cell 8 and Valve House 8 construction activities, A1PIV Part Three was incorporated into A1PIV.

1.4 OBJECTIVES

The objectives of this Certification Report are to:

- Provide an overview of previous precertification activities conducted in A1PIV Parts Two and Three
- Describe the analytical methods, data validation processes, data reduction and statistical processes used to support the certification process
- Present the statistical analysis of the sampling results for the CUs within A1PIV Parts Two and Three, which show the certification criteria have been met
- Present the conclusion regarding the need, or lack there of, for soil remediation.

1.5 REPORT FORMAT

This certification report is presented in six sections with supporting documentation and data in Appendix A. The sections of this report are as follows:

Section 1.0	Introduction: Purpose, background, area description and objectives of the report
Section 2.0	Certification Approach: The CU design and approach to sampling and analysis used for certification
Section 3.0	Overview of Field Activities: Area preparation/survey, sampling and changes to work scope
Section 4.0	Analytical Methodologies, Data Validation Processes and Data Reduction
Section 5.0	Certification Evaluation and Conclusions
Section 6.0	Protection of Certified Areas
Appendix A	Certification Samples, Analytical Results and Statistics Tables

1.6 FCP CONTROLLED CERTIFICATION MAP

In order to track certification and characterization for reuse areas at the FCP, DOE has included a controlled map (Figure 1-2) showing the status of the soil remediation areas and phased areas with all Certification Reports and CDLs. Note that this figure has been revised to show the certification status of A1PIV Parts Two and Three.

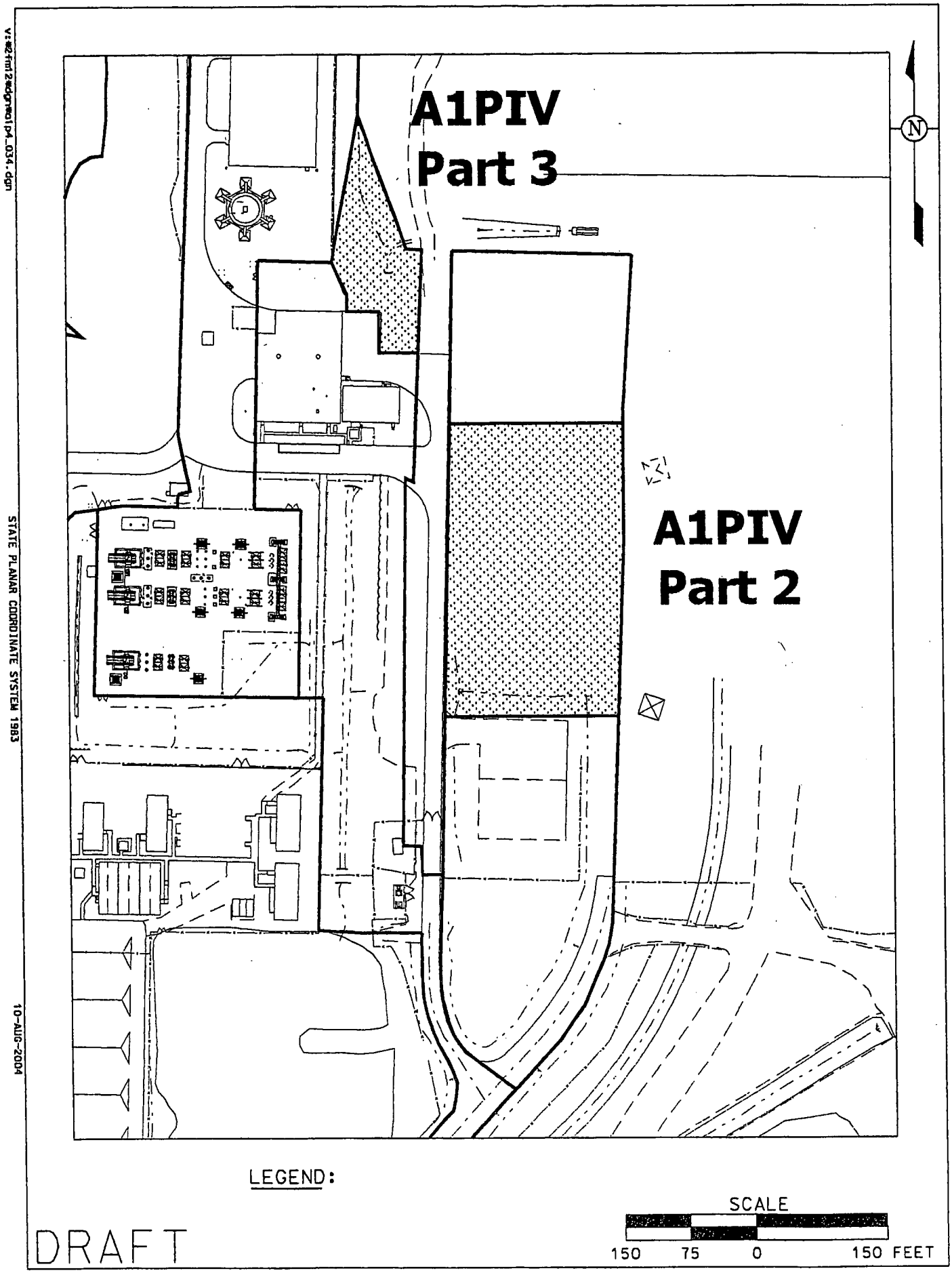
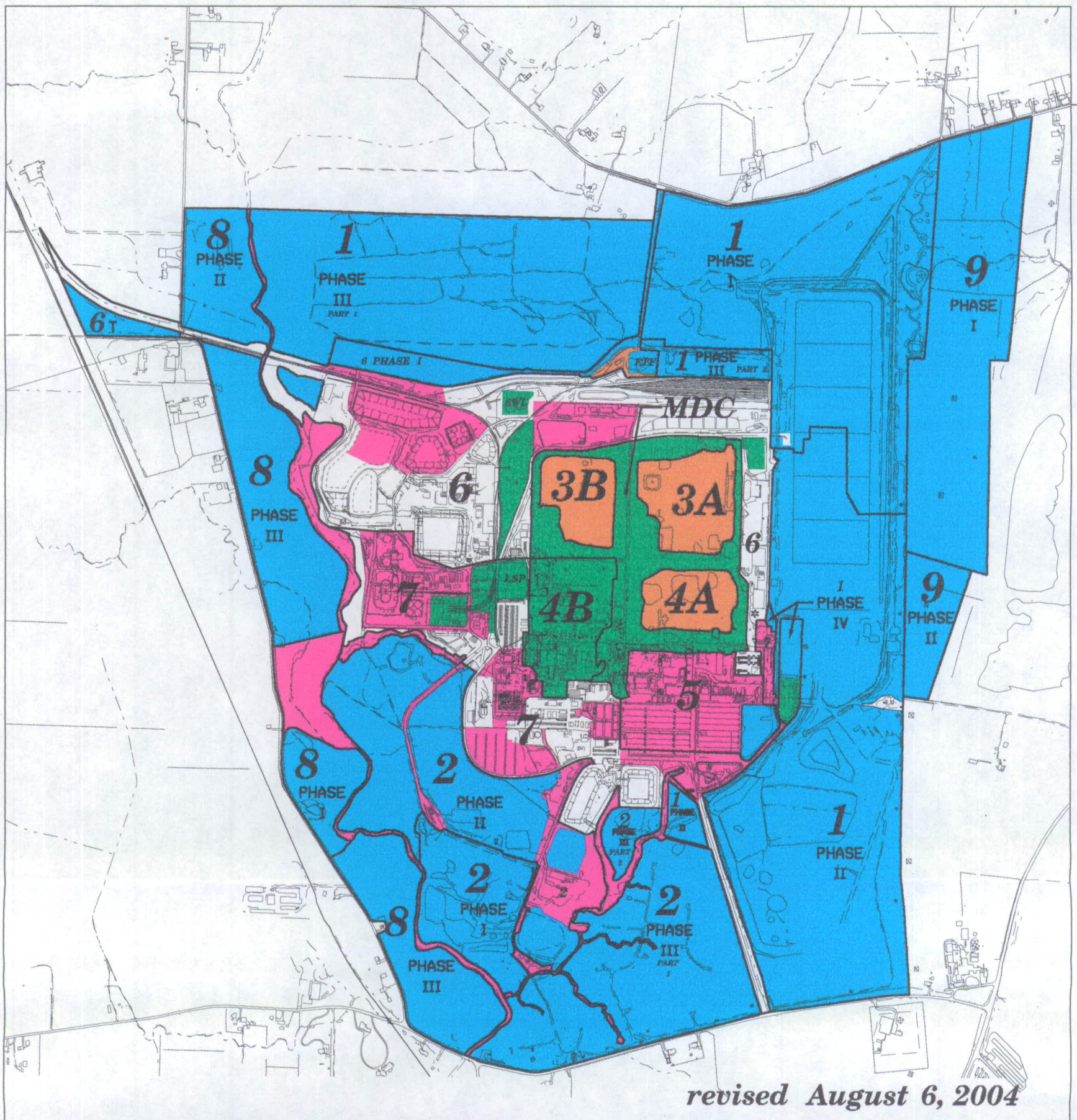


FIGURE 1-1. AREA 1, PHASE IV PARTS TWO AND THREE LOCATIONS



revised August 6, 2004

AREAS	TOTAL ACRES	APPROVED CERT. ACRES	CERT. ACRES IN PROGRESS	REMEDIATION ACRES IN PROGRESS	PREDESIGN ACRES IN PROGRESS	REMAINING ACRES
AREA 1	395	393.0	0	1.7	0	0.2
AREA 2	175.0	160.4	0	0	14.6	0
AREA 3A/4A	27.0	0	16.4	10.6	0	0
AREA 3B/4B	31.0	0	11.1	19.9	0	0
AREA 5	27.1	3.2	0	0	23.9	0
AREA 6	142.0	18.8	1.4	7.7	29.6	84.5
AREA 7	84.2	0	0	7.2	40.3	36.7
AREA 8	98.9	98.9	0	0	0	0
AREA 9	0.7	0	0	0	0	0.75*
MDC	36.3	0	0	36.3	0	0
PR/SSOD/PPDD	32.3	0	0	0	32.3	0
TOTAL ON SITE	1049.5	674.3	28.8	83.4	140.7	122.2
AREA 9	90.8	84.5	0	6.3	0	0
TOTAL OFF SITE	90.8	84.5	0	6.3	0	0

* ONSITE AREA9 REMAINING ACRES INCLUDE THE DISSOLVED OXYGEN FACILITY AREA, WHICH WILL BE CERTIFIED AS PART OF THE OLD OUTFALL LINE CERTIFICATION. THE INTERIM LEACHATE LINE CORRIDOR IS INCLUDED IN AREA 6.

AIPI ROADS EXCLUDED FROM CERTIFICATION IDENTIFIED AS: ▬.

AREA 10 INCLUDES PIPELINES RELATED TO GROUNDWATER REMEDIATION AND OTHER UTILITIES NOT SPECIFICALLY LISTED.

SCALE

1100 550 0 1100 FEET

FIGURE 1-2. FCP CONTROLLED CERTIFICATION MAP

v:\6o131\dgn\bmp\cert\map4.dgn

STATE PLANAR COORDINATE SYSTEM 1983

06-AUG-2004

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2.0 CERTIFICATION APPROACH

2.1 CERTIFICATION STRATEGY

This section summarizes the area-specific constituent of concern (ASCOC) selection process and the certification approach, including CU establishment, sampling design, and statistical analysis. The general certification strategy is described in Section 3.4 of the SEP, and the A1PIV Part Two specific strategy is described in the CDL for A1PIV Part Two; the A1PIV Part Three specific strategy is described in the CDL for A1PIV Part Three.

2.1.1 Area-Specific Constituents of Concern

As committed in the SEP, the sitewide primary radiological constituents of concern (COCs) (total uranium, radium-226, radium-228, thorium-228, and thorium-232) were retained as ASCOCs for this remediation effort. The secondary COCs were selected as described in Section 2.1.3.

2.1.2 ASCOC Selection Criteria

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

- It was retained as an ASCOC in adjacent FCP soil remediation areas;
- 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;
- Analytical results show that a contaminant is present above its FRL, and the above-FRL concentrations are not attributable to false positives or elevated contract-required detection limits (CRDLs);
- It can be traced to site use, either through process knowledge or known release of the constituent to the environment; and
- 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.

2.1.3 ASCOC Selection Process

Until August of 2003, the area that now represents A1PIV Part Two has been a part of the Area 5 Administrative Side. In addition to the above process, the complete list of primary and secondary COCs presented in Table 2-7 of the SEP for remediation Area 5 was focused for A1PIV Part Two. Total uranium, radium-226, radium-228, thorium-228, and thorium-232 are sitewide primary COCs and were

therefore retained as ASCOCs. Technetium-99 was retained in CU 2 due to the contaminated effluent and sanitary lines that were excavated. Thorium-230, mercury, polychlorinated biphenyls (PCBs), and select volatile organic compounds (VOCs) were retained in CU 3 due to the mixed waste shipment leak in the truck staging area. The final list of ASCOCs for A1PIV Part Two is provided in Table 2-1.

The area that now represents A1PIV Part Three has previously been a part of the Area 7 Administrative Side. In addition to using the above process, the complete list of primary and secondary COCs presented in Table 2-7 of the SEP for remediation Area 7 was focused for the A1PIV Part Three certification effort. The final list of ASCOCs selected for A1PIV Part Three is provided in Table 2-2.

2.2 CERTIFICATION APPROACH

2.2.1 Certification Unit Design

The certification design for A1PIV Parts Two and Three follows the general approach outlined in Section 3.4 of the SEP. Factors such as historical land use, proximity to other areas of the site, and residual COC data were used to determine the boundaries for the CUs. A1PIV Part Two consists of two Group 1 CUs (A1PIV CU 2 and CU 3) while A1PIV Part Three is one Group 1 CU (A1PIV CU 4). Group 1 CUs will allow for more concentrated sampling and ensure excavation activities had no effect on the soil.

2.2.2 Sample Selection Process

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 16 random locations met the minimum distance criteria. All sub-CUs and planned A1PIV Part Two and A1PIV Part Three certification sampling locations are shown on Figure 2-1 and Figure 2-2, respectively.

2.2.3 Certification Sampling

Following the Project Specific Plan for Area 1, Phase IV Part Two Certification Sampling (DOE 2004c) and the Project Specific Plan for Area 1, Phase IV Part Three Certification Sampling (DOE 2004d), and prior to commencement of certification sampling field activities, all certification sample locations were surveyed and field verified to make sure no surface obstacles would prevent collection at the planned

location. Samples were collected for analysis from 0 to 6 inches at 12 of the 16 locations in each CU. The four samples designated as "archive" were not collected.

2.2.4 Statistical Analysis

The statistical analysis of certification samples is discussed in Appendix G of the SEP. Per Section G.2.3 of the SEP, statistical analysis of certification results is not necessary to determine if an ASCOC passed certification in a CU if all of the results for that ASCOC in that CU were below FRL. If any sample result does exceed the associated FRL, then statistical analysis must be performed and 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 UCL on the mean of each primary COC to its FRL, or the 90 percent UCL on the mean of each secondary ASCOC. On an individual CU basis, any ASCOC with the 95 percent UCL (for primary ASCOCs) or 90 percent UCL (for secondary ASCOCs) 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 *a posteriori* test will be performed to determine whether the sample size is sufficient for a meaningful conclusion of this comparison. The second criterion is the hot spot criterion, which states that primary or secondary ASCOC results must not exceed two times the FRL. When the given UCL on the mean for each COC is less than its FRL and the hotspot criterion is met, the CU will be considered certified.

TABLE 2-1
ASCOC LIST FOR A1PIV PART TWO

ASCOC	On-Property 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
Technetium-99	29.1 pCi/g	Retained in CU2 due to elevated radiation levels encountered during excavation of the sanitary and effluent lines
Aroclor-1254	0.13 mg/kg	Retained in CU3 due to mixed waste leak from a tractor-trailer in the Truck Staging Area. The mixed waste had been characterized as TSCA – Regulated for PCBs. Additional characterization data found in the Material Evaluation Form indicated the mixed waste carried F-listings of F001 & F002 and that mercury carried the D009 code.
Aroclor-1260	0.13 mg/kg	
Mercury	7.5 mg/kg	
1,1,1-Trichloroethane	4.3 mg/kg[a]	
Carbon Tetrachloride	2.1 mg/kg	
Trichloroethene	25 mg/kg	
Thorium-230	230 pCi/g	

[a]1,1,1-Trichloroethane does not have an associated FRL, therefore, to assess impact to the area, the FRL for 1,1,2-Trichloroethane will be used.

mg/kg – milligrams per kilogram
pCi/g – picoCuries per gram
TSCA – Toxic Substances Control Act

TABLE 2-2
ASCOC LIST FOR A1PIV PART THREE

ASCOC	On-Property 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
Aroclor-1254	0.13 mg/kg	Above-FRL results in area
Aroclor-1260	0.13 mg/kg	Above-FRL results in area
Dieldrin	0.015 mg/kg	Above-FRL results in area

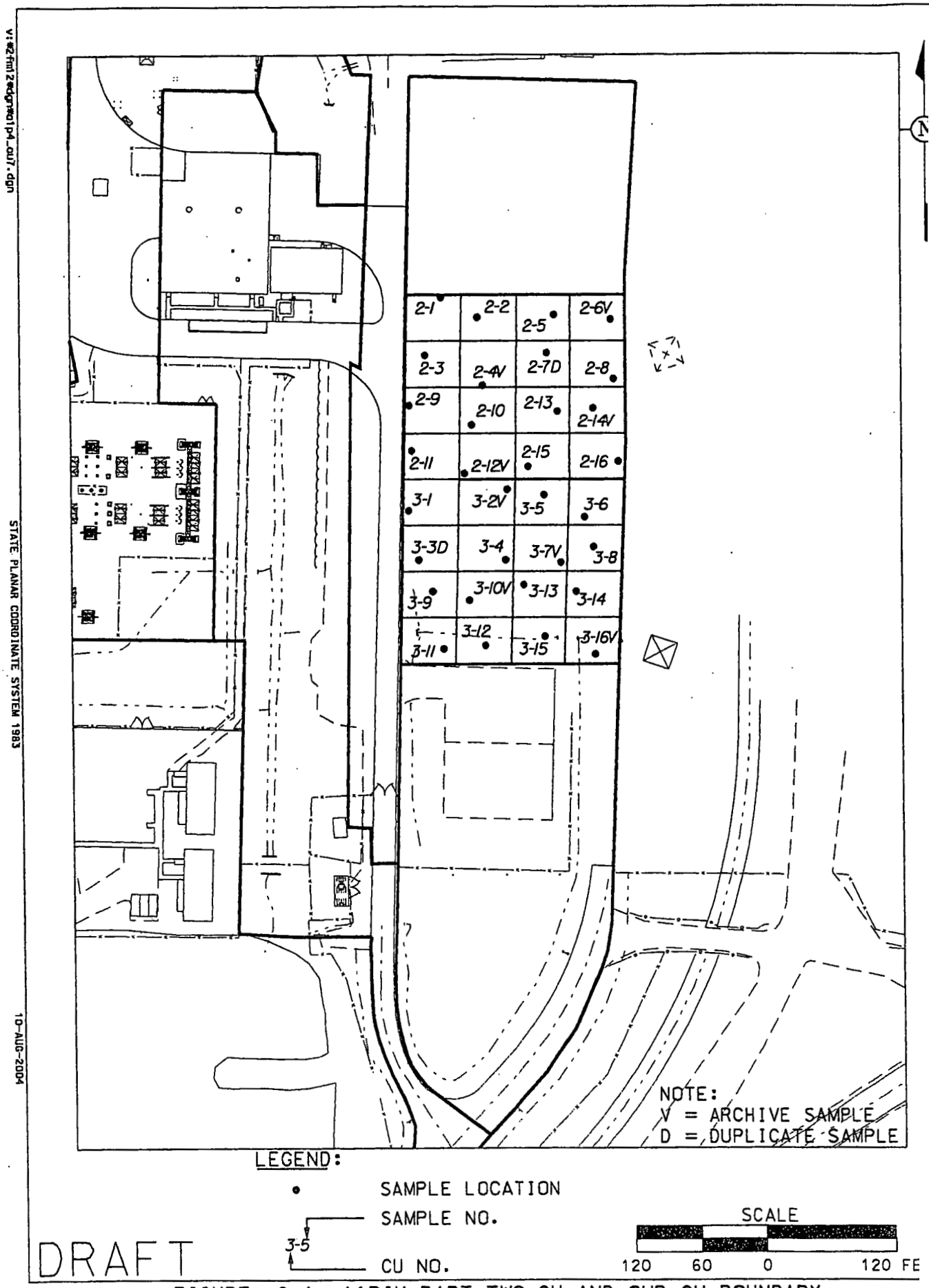

FIGURE 2-1. A1PIV PART TWO CU AND SUB-CU BOUNDARY AND CERTIFICATION SAMPLING LOCATIONS

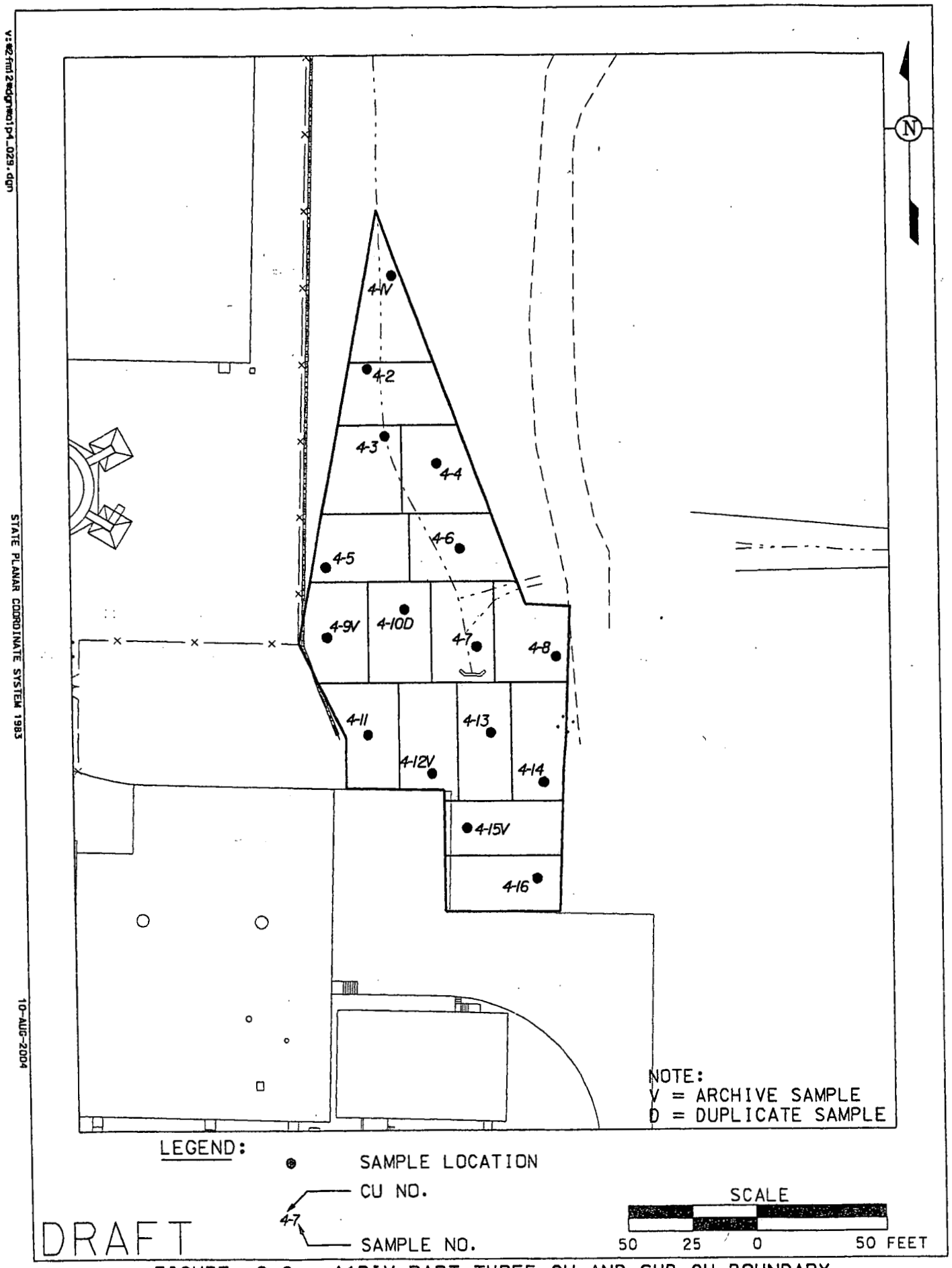

FIGURE 2-2. A1PIV PART THREE CU AND SUB-CU BOUNDARY AND CERTIFICATION SAMPLING LOCATIONS

3.0 OVERVIEW OF FIELD ACTIVITIES

3.1 DATA EVALUATION AND PRECERTIFICATION

In preparation of precertification and certification activities, all historical soil data relative to A1PIV Parts Two and Three were evaluated.

Soil samples have been collected from A1PIV Part Two in support of the Remedial Investigation/Feasibility Studies (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 2 Certification Sampling (DOE 2000); Predesign Investigation in Area 5 (DOE 2002b); and the Project Specific Plan for Area 1, Phase IV Predesign Sampling of the Truck Staging Area (DOE 2004e). All historical and predesign data were below FRLs.

Samples collected for A1PIV Part Three were in support of the RI/FS, and one location showed elevated thorium at 5 to 5.5 feet. During sampling to bound the thorium, additional locations were sampled for the ASCOCs due to limited amount of sampling in the area. All samples were below FRL except for three surface samples that were above-FRL for PCBs. One of those samples was also above-FRL for dieldrin. Following excavation of the above-FRL locations, samples were collected to confirm that all above-FRL soil had been removed. The post excavation sample results were provided in the A1PIV CDL.

Precertification activities took place in A1PIV Part Two during April of 2004 and in A1PIV Part Three during May of 2004. All precertification activities were completed under the PSP for A1PIV Excavation Characterization and Precertification (DOE 2004f). Following the removal of underground utilities and a 6-inch surface scrape, Phase 1 and Phase 2 real-time scans were completed over each area using the mobile sodium iodide (NaI) detectors and high-purity germanium (HPGe) detectors. No pockets of elevated activity were identified during real-time scanning. All precertification data were submitted in each areas respective CDL.

Based on the results from the above sampling events, it was determined that certification of the soil in A1PIV Parts Two and Three could be completed.

3.2 CHANGES TO SCOPE OF WORK

The scope of work for A1PIV Part Two Certification Sampling required one change, and that was to modify the sample collection method for VOC samples. The variance/field change notice (V/FCN), 20730-PSP-0004-1, is included in Appendix B.

4.0 ANALYTICAL METHODOLOGIES, DATA VALIDATION PROCESSES AND DATA REDUCTION

4.1 ANALYTICAL METHODOLOGIES

All samples collected were sent off-site for analysis. The laboratories complied with Sitewide CERCLA Quality Assurance Project Plan (SCQ) requirements. The SCQ is the source for analytical methodologies (Appendix G), data verification and validation, and analytical and field quality assurance/quality control (QA/QC) requirements.

Laboratory analysis of certification samples was conducted using approved analytical methods, as discussed in Appendix H of the SEP. The minimum detection level (MDL) was set at 10 percent of the FRL and analyses were conducted to analytical support level (ASL) D or E, where the MDL of 10 percent of the FRL is above the SCQ ASL detection level, but the analyses meet all other SCQ ASL D criteria. ASL D data packages were provided for all of the analytical data. All data were validated. Once data were validated as required, results were entered into the FCP Sitewide Environmental Database (SED). Certification results are provided in Appendix A, and a summary of the analytical methods follows:

4.1.1 Chemical Methods

Volatile Organic Compounds

Samples submitted for VOC analysis were analyzed by gas chromatography/mass spectroscopy.

Pesticides/PCBs

Samples submitted for analysis of dieldrin and aroclor-1254/1260 were analyzed by gas chromatography.

Mercury

Samples submitted for mercury analysis were analyzed by cold vapor atomic absorption.

4.1.2 Radiochemical Methods

The radiochemical analytical methods depended on the specific nuclides of interest. Performance-based specification criteria included highest allowable minimum detectable concentration (HAMDC), percent overall tracer/chemical recovery, percent matrix spike recovery, method blank concentration, percent recovery of laboratory control sample, and relative error ration for duplicate samples for each analyte. The off-site laboratory was required to meet these specifications using the methodologies described below.

Total Uranium

Samples were analyzed for uranium-238 using gamma spectroscopy, and the results were used to calculate the total uranium value. The calculation used was as follows:

Total uranium (mg/kg) = (2.998544) x uranium-238 gamma spectrometry result (pCi/g)

The validation qualifier assigned to the total uranium value was the same as the uranium-238 qualifier.

Radium-226

Samples were analyzed by gamma spectroscopy, and radium-226 was quantified by measuring gamma rays emitted by members of its decay chain. This method does not require chemical separation, but the samples must be allowed a 20-day progeny in-growth period before counting. The off-site laboratory used the same gamma ray emission lines and error weighted average methodology to calculate all A1PIV Parts Two and Three certification results.

Radium-228

Following gamma spectroscopy analysis, radium-228 was also quantified by measuring gamma rays emitted by members of its decay chain. The off-site laboratory used the same gamma ray emission lines and error weighted average methodology to calculate all A1PIV Parts Two and Three certification results.

Thorium-228, Thorium-230 and Thorium-232

Thorium-228, thorium-230, and thorium-232 were quantified by measuring gamma rays emitted by members of its decay chain by gamma spectroscopy. The off-site laboratory used the same gamma ray emission lines and error weighted average methodology to calculate all A1PIV Parts Two and Three certification results.

Technetium-99

Samples submitted for technetium-99 analysis were quantified using a liquid scintillation counter.

4.2 DATA VERIFICATION AND VALIDATION

This section discusses the data verification and validation (V&V) process used to examine the quality of field and laboratory results. Data were qualified to indicate the level of data usability, or level of confidence in the reported analytical results. The U.S. Environmental Protection Agency (EPA) National Functional Guidelines for Data Review (Inorganic Data) (EPA 1994), as adapted and approved by EPA Region V, as well as Section 11.2 and Appendix D of the SCQ, was used for this process.

Specific parameters associated with the data were evaluated during V&V to determine whether or not the data quality objectives were met. Five principal QA parameters (i.e., precision, accuracy, completeness, comparability, and representativeness) were addressed during V&V. Field sampling and handling, laboratory analysis and reporting, and non-conformances and discrepancies in the data were examined to ensure compliance with appropriate and applicable procedures.

The V&V process evaluated the following parameters:

- Specific field forms for sample collection and handling
- Chain of Custody forms
- Completeness of laboratory data deliverable.

The data validation process examined the analytical data to determine the validation qualifier of the results. General areas examined that apply to all the chemical data include the following:

- Holding times
- Instrument calibrations
- Calculation of results
- Matrix spike/matrix spike duplicate recoveries
- Laboratory/field duplicate precision
- Field/Laboratory Blank contamination
- Dry weight correction for solid samples
- Correct detection limits reported
- Laboratory control sample recoveries and compliance with established limits.

Parameters unique to the evaluation of radiochemical analyses include:

- Calibration data for specific energies
- Background checks
- Relative error ratios
- Detector efficiencies
- Background count correction.

For this project, all the radiological data were reviewed and validated for all criteria noted above. All of the certification data were validated to Level D, which included a systematic review of the raw data and recalculations in addition to the Level B review.

Following V&V, qualifier codes were applied to specific data points, reflecting the level of confidence assigned to the particular datum. These codes included:

-	No qualification; the positive result or detection limit is confident as reported
J	Positive result is estimated or imprecise; data point is usable for decision-making purposes. Positive results less than the contract required reporting limit are also qualified in this manner
R	Positive result or detection limit is considered unreliable; data point should not be used for decision-making purposes
U	Undetected result at the stated limit of detection
UJ	Undetected result; detection limit is considered estimated or imprecise; the data point is usable for decision-making purposes
N	Positive result is tentatively identified - that is, there is some question regarding the actual identification and quantification of the result. Compound reported is best professional judgement of the interpretation of the supporting data, such as mass spectra. Caution must be exercised with the use of this data
NJ	The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration. This qualifier indicates the presumptive presence of the analyte, but the result can only be considered estimated.
NV	Not Validated. The results for this sample were not validated
Z	This result, or detection limit in this analysis is not the best one to use; another analysis (e.g., the dilution or re-analysis) contains a more confident and usable result.

The V&V of this data set did not identify any problems. The following qualifier codes were applied to the A1PIV Parts Two and Three sampling results: (-), (J), (NJ), or (U). No results were qualified as rejected (R).

4.3 DATA REDUCTION

Each sample used to support the certification decision of A1PIV Parts Two and Three was entered in the SED with the following information:

Field Information

- Sample Identification Number - A unique number assigned to each discrete sample point.
- Coordinate Information - Northing and Easting locations.
- Certification Unit – Each sample is assigned to a CU based on location.

Laboratory Information

For each sample result the following information was entered:

- Laboratory Result - The reported analytical value from the laboratory.
- Laboratory Qualifier - The qualifier reported from the lab. For radiological parameters, non-detect values are assigned a U qualifier.
- Total Propagated Uncertainty (TPU) – This value represents the uncertainty associated with the reported result. TPU includes the counting error, as well as uncertainty from other laboratory measurements and data reduction. (Applicable to radiological parameters only)
- Units - The units in which the laboratory result is reported.

Validation Information

- Validation Result - The result based on the validation process. During the validation process, sample results may be adjusted. If the laboratory result is less than the associated MDC, the validation result becomes the MDC value.
- Validation TPU - The TPU based on the validation process.
- Validation Qualifier - The qualifier assigned as a result of the data validation process.
- Validation Units - The units in which the validation result is reported.

Using the information as summarized above, the following actions were taken for data reduction of the CU data set.

1. All the data for each CU were queried from SED. All the data were used even if the CU had more than the minimum required data points.
2. The data from the validation fields were used for statistical calculations.
3. Data with a qualifier of R or Z was not used in the statistical calculations.
4. The higher of the two duplicate results was used in the statistical calculations.
5. One half of the non-detect (U or UJ) values were used in the statistical calculations.

5.0 CERTIFICATION EVALUATION AND CONCLUSIONS

5.1 CERTIFICATION RESULTS, ISSUES AND EVALUATION

The validated results from each CU were subjected to statistical analysis described in the SEP. Results for PCBs at sample location A1P4-C4-13 were elevated for PCBs but were not greater than twice the FRL. Statistical analysis conducted on PCBs for CU 4 indicated the CU met the certification criteria discussed in Section 2.2.4. No other issues were identified throughout the remaining A1PIV Parts Two and Three sampling, analytical, and validation process. Final certification data for all three CUs are provided in Appendix A.

5.2 CERTIFICATION CONCLUSIONS

All certification requirements have been satisfied for both Area 1, Phase IV Parts Two and Three, and based on all the sampling results presented in this report, DOE has determined that no further remedial actions are required in A1PIV Parts Two and Three and certification activities are complete. Upon U.S. Environmental Protection Agency (EPA) and Ohio Environmental Protection Agency (OEPA) concurrence, Area 1, Phase IV Part Two and Area 1, Phase IV Part Three will be released for final land use.

6.0 PROTECTION OF CERTIFIED AREAS

DOE has restricted access to certified areas in order to maintain their integrity prior to transferal for final land use. FCP procedure EP-0008, Access to a Certified Area, has been developed to implement a process to protect certified areas from becoming recontaminated.

The procedure is summarized as follows:

- At the initiation of certification sampling activities for a remediation area, temporary fencing will be installed to delineate the perimeter of the "certified" area;
- Signs will be posted upon the temporary perimeter fencing to require access approval for entry into the "certified" area;
- To gain access to the "certified" area, the individual(s) or project desiring admittance will submit a written request to the responsible project manager;
- Any equipment used within the "certified" area must have been clean in accordance with FCP certified area access procedure subsequent to any use in an uncertified area; or for any work, before entry into a "certified" area;
- FCP management teams representatives must instruct general employees/operators on the entry and exit requirements for a "certified" area.

After DOE, EPA, and OEPA agree that an area is certified, the area will be transferred for final land use. At that time, best management practices and administrative controls will be used to protect the area from contamination, and other controls will be implemented as needed.

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APPENDIX A

CERTIFICATION SAMPLES, ANALYTICAL RESULTS AND STATISTICS TABLE

A1PIV PART TWO CU 2

	PRIMARY COCs					SECONDARY COC
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99
A1P4-C2-1	0.795 -	0.926 -	0.941 -	0.926 -	14.7 -	1.57 U
A1P4-C2-2	0.989 -	1.07 -	1.10 -	1.07 -	13.3 -	1.86 U
A1P4-C2-3	0.843 -	0.974 -	1.00 -	0.974 -	8.00 -	2.21 U
A1P4-C2-5	1.09 -	1.17 -	1.14 -	1.17 -	9.63 -	1.81 U
A1P4-C2-7	1.00 -	1.05 -	1.05 -	1.05 -	8.06 -	1.60 U
A1P4-C2-7-D	0.920 -	0.955 -	0.953 -	0.955 -	8.50 -	1.69 U
A1P4-C2-8	0.840 -	0.862 -	0.877 -	0.862 -	4.03 -	1.60 U
A1P4-C2-9	0.966 -	1.08 -	1.17 -	1.08 -	7.63 -	1.42 U
A1P4-C2-10	0.788 -	0.951 -	0.957 -	0.951 -	12.0 -	1.79 U
A1P4-C2-11	0.842 -	0.996 -	1.00 -	0.996 -	11.5 -	1.67 U
A1P4-C2-13	0.776 -	1.05 -	0.982 -	1.05 -	7.00 -	1.82 U
A1P4-C2-15	0.974 -	0.973 -	0.988 -	0.973 -	7.37 -	1.69 U
A1P4-C2-16	0.953 -	1.20 -	1.19 -	1.20 -	6.91 -	1.71 U
FRL	1.70	1.80	1.70	1.50	82.0	30.0
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	pCi/g
Confidence Level	95%	95%	95%	95%	95%	90%
Max. Results	1.09	1.20	1.19	1.20	14.7	2.21 U
Max. >=Limit	No	No	No	No	No	No
W-statistic Prob.*	–	–	–	–	–	–
Test Procedure	–	–	–	–	–	–
Sample Size	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12
% Nondetects	0%	0%	0%	0%	0%	100%
Est. Mean **	–	–	–	–	–	–
UCL	–	–	–	–	–	–
Prob. > Limit	–	–	–	–	–	–
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	–	–	–	–	–	–
Size Calculation	–	–	–	–	–	–

Definition of Qualifiers
J = estimated result
UJ = not detected, estimated
U = not detected
- = no data qualifier
NV = not validated
UNV = not detected, not validated
NJ = tentatively identified

Footnotes for Appendix A:

The maximum value of the two duplicates was used in all statistical equations

* W-Statisic Probability is the highest calculated probablity of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal or N) and the log-transformed data (LogNormal or LN) to test for lognormality.

** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)

A1PIV PART TWO CU 3

	PRIMARY COCs					SECONDARY COCs						
SAMPLE_ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Thorium-230	Mercury	Aroclor-1254	Aroclor-1260	1,1,1-Trichloroethane	Carbon Tetrachloride	Trichloroethene
A1P4-C3-1	0.784 -	0.784 J	0.753 J	0.784 J	11.7 -	17.2 UNJ	0.02 J	4.50 J	2.50 J	2.00 U	2.00 U	2.00 U
A1P4-C3-3	0.913 -	0.997 J	0.976 J	0.997 J	8.99 -	20.8 UNJ	0.025 J	2.50 J	3.80 U	1.40 U	1.40 U	1.40 U
A1P4-C3-3-D	0.839 -	0.871 J	0.843 J	0.871 J	5.75 -	7.71 UNJ	0.026 J	3.80 U	3.80 U	1.30 U	1.30 U	1.30 U
A1P4-C3-4	0.963 -	0.935 J	0.954 J	0.935 J	16.6 -	15.6 UNJ	0.022 J	2.80 J	3.70 U	1.20 U	1.20 U	1.20 U
A1P4-C3-5	0.772 -	1.01 J	0.997 J	1.01 J	8.73 -	11.7 UNJ	0.022 J	4.20 U	4.20 U	1.70 U	1.70 U	1.70 U
A1P4-C3-6	0.969 -	1.05 J	1.08 J	1.05 J	11.7 -	15.3 UNJ	0.029 J	1.80 J	3.80 U	1.20 U	1.20 U	1.20 U
A1P4-C3-8	0.980 -	0.865 J	0.858 J	0.865 J	5.75 -	16.9 UNJ	0.023 J	3.70 U	3.70 U	1.10 U	1.10 U	1.10 U
A1P4-C3-9	1.02 -	1.06 J	1.07 J	1.06 J	5.89 -	14.7 UNJ	0.026 J	3.80 U	3.80 U	1.10 U	1.10 U	1.10 U
A1P4-C3-11	0.933 -	1.26 J	1.22 J	1.26 J	8.86 -	13.0 UNJ	0.026 J	3.90 U	3.90 U	1.30 U	1.30 U	1.30 U
A1P4-C3-12	0.821 -	1.05 J	1.06 J	1.05 J	9.88 -	15.2 UNJ	0.031 J	3.90 U	1.70 J	1.20 U	1.20 U	1.20 U
A1P4-C3-13	0.888 -	1.28 J	1.26 J	1.28 J	4.31 -	15.8 UNJ	0.021 J	4.00 U	4.00 U	1.50 U	1.50 U	1.50 U
A1P4-C3-14	0.937 -	1.18 J	1.18 J	1.18 J	11.3 -	7.60 UNJ	0.024 J	3.90 U	3.90 U	1.40 U	1.40 U	1.40 U
A1P4-C3-15	0.956 -	1.08 J	1.09 J	1.08 J	9.75 -	6.33 UNJ	0.027 J	4.20 U	4.20 U	2.10 U	2.10 U	2.10 U
FRL	1.70	1.80	1.70	1.50	82.0	280	7.5	130	130	4300[a]	2100	25000
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	pCi/g	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%	90%
Max. Results	1.02	1.28	1.26	1.28	16.6	20.8 UNJ	0.031	4.50	2.50	2.10 U	2.10 U	2.10 U
Max. >=Limit	No	No	No	No	No	No	No	No	No	No	No	No
W-statistic Prob.*	–	–	–	–	–	–	–	–	–	–	–	–
Test Procedure	–	–	–	–	–	–	–	–	–	–	–	–
Sample Size	12	12	12	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	0	8	10	12	12	12
% Nondetects	0%	0%	0%	0%	0%	100%	0%	75%	83%	100%	100%	100%
Est. Mean **	–	–	–	–	–	–	–	–	–	–	–	–
UCL	–	–	–	–	–	–	–	–	–	–	–	–
Prob. > Limit	–	–	–	–	–	–	–	–	–	–	–	–
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size Calculation	–	–	–	–	–	–	–	–	–	–	–	–

[a] 1,1,1-Trichloroethane does not have an associated FRL, therefore, to assess impact to the area, the FRL for 1,1,2-Trichloroethane will be used.

A1PIV PART THREE CU 4

	PRIMARY COCs					SECONDARY COCs		
SAMPLE_ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Aroclor-1254	Aroclor-1260	Dieldrin
A1P4-C4-2	0.968 J	1.07 J	1.06 J	1.07 J	12.8 -	19.0 -	13.0 -	0.500 J
A1P4-C4-3	1.02 J	1.11 J	1.12 J	1.11 J	19.3 -	58.0 -	95.0 -	20.3 J
A1P4-C4-4	1.03 J	1.16 J	1.15 J	1.16 J	7.32 -	29.0 -	35.0 -	1.70 U
A1P4-C4-5	0.987 J	1.21 J	1.20 J	1.21 J	30.7 -	2.60 J	2.00 J	1.60 U
A1P4-C4-6	1.04 J	1.08 J	1.06 J	1.08 J	5.52 -	4.30 U	4.30 U	1.70 U
A1P4-C4-7	0.932 J	0.970 J	1.02 J	0.970 J	5.97 -	1.00 J	4.80 U	1.90 U
A1P4-C4-8	0.921 J	0.996 J	0.990 J	0.996 J	3.11 -	1.10 J	4.80 U	1.90 U
A1P4-C4-10	1.02 J	1.06 J	1.11 J	1.06 J	9.51 -	49.0 -	57.0 -	1.50 U
A1P4-C4-10-D	0.999 J	1.10 J	1.08 J	1.10 J	8.46 -	3.00 J	2.90 J	1.50 U
A1P4-C4-11	0.966 J	1.07 J	1.10 J	1.07 J	12.6 -	2.80 J	1.40 J	1.50 U
A1P4-C4-13	0.844 J	0.962 J	1.02 J	0.962 J	20.0 -	210 -	240 -	29.8 J
A1P4-C4-14	0.807 J	0.839 J	0.822 J	0.839 J	4.57 -	4.40 U	4.40 U	1.80 U
A1P4-C4-16	0.918 J	0.938 J	0.944 J	0.938 J	6.33 -	2.50 J	2.90 J	0.200 J
FRL	1.70	1.80	1.70	1.50	82.0	130	130	15.0
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	ug/kg	ug/kg	ug/kg
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Results	1.04	1.21	1.20	1.21	30.7	210	240	29.8
Max. >=Limit	No	No	No	No	No	Yes	Yes	Yes
W-statistic Prob.*	–	–	–	–	–	8.1% (LN)	5.2% (LN)	4.6% (LN)
Test Procedure	–	–	–	–	–	Median (Sign)	Median (Sign)	Median (Sign)
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	2	4	8
% Nondetects	0%	0%	0%	0%	0%	17%	33%	67%
Est. Mean **	–	–	–	–	–	2.70	3.85	1.23
UCL	–	–	–	–	–	29.0	35.0	1.70
Prob. > Limit	–	–	–	–	–	–	–	–
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

a posteriori Sample	–	–	–	–	–	5	5	9
Size Calculation	–	–	–	–	–	Pass	Pass	Pass

APPENDIX B

VARIANCES/FIELD CHANGE NOTICES FOR A1PIV PARTS TWO AND THREE CERTIFICATION SAMPLING

VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): NO	V/F: 20730-PSP-0004-1
WBS NO.: PROJECT/DOCUMENT/ECDC # 20730-PSP-0001 Rev. 0		Page: 1 of 2
PROJECT TITLE: PSP for Area 1, Phase IV Part Two Certification Sampling		Date: 6/7/04

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This V/FCN documents the modification of Table 3-1 to change the hold time, container type, and minimum mass for soil VOC (TAL D) samples collected under this PSP. The changes within the table are in **bold**.

TABLE 3-1
SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Method	Sample Matrix	ASL	Preserve	Hold Time	Container[b]	Minimum Mass
Radiological (TAL A & B)	Gamma Spec or GPC	Solid	D/E[a]	None	12 months	Plastic or stainless steel core liner or glass or polyethylene sample container	300 g (900 g)[c]
Radiological (TAL A & C)	Gamma Spec	Solid	D/E[a]	Cool, 4° C	12 months	Glass with Teflon-lined lid	450 g (1350 g)[c]
Metals (TAL C)	CVAA				28 days		
PCBs (TAL C)	GC				14 days		
VOCs (TAL D)	GC/MS	Solid	D/E[a]	Cool, 4° C	7 days	**3 x 1-Encore Sampler[c] plus a 2oz jar for % moisture**	**Each full Encore Sampler[c] will hold approx. 5 g of soil**
Radiological (TAL A)	Gamma Spec	Liquid (rinsate[d])	D/E[a]	HNO_3 pH<2	6 months	Glass or Polyethylene	4 liters
VOCs (TAL D)	GC/MS	Liquid (trip blank)	D/E[a]	Cool, 4° C H_2SO_4 pH<2	14 days	3 x 40-ml glass with teflon-lined septa	120 ml (no headspace)

[a]Samples will be analyzed according to Analytical Support Level (ASL) D requirements but the minimum detection level may cause some analyses to be considered ASL E.
[b]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.
[c]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".
[d]If "push tubes" are used for sampling, the off-site laboratories will be sent container blanks. If an alternative sample method is used, a rinsate will be collected by the Field Technicians.

CVAA – cold vapor atomic absorption
GC/MS – gas chromatography mass spectroscopy
GPC – gas proportional counting

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VARIANCE / FIELD CHANGE NOTICE	Significant? (Yes or No): NO	V/F: 20730-PSP-0004-1
WBS NO.: PROJECT/DOCUMENT/ECDC # 20730-PSP-0001 Rev. 0		Page: 2 of 2
PROJECT TITLE: PSP for Area 1, Phase IV Part Two Certification Sampling		Date: 6/7/04

Justification:
The VOC samples will be collected in Encore Samplers and the Sampling and Analytical Requirements table needed to be changed to correctly document the hold time, container type, sample mass.

REQUESTED BY: Denise Arico Date: 6/7/04

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Frisk	6-8-04	X	PROJECT MANAGER: J.D. Chiou	6/8/0
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: K. Miller	6/7/04
X	ANALYTICAL CUSTOMER SUPPORT: Heather Medley	6/8/04		RTIMP Manager	
X	WAO	6/8/04	X	Sampling Manager: T. Bubriage	6/8/0

VARIANCE/FCN APPROVED [X]YES [ ]NO REVISION REQUIRED: [ ]YES [x]NO

DISTRIBUTION

PROJECT MANAGER:	DOCUMENT CONTROL: Jeannie Rosser	OTHER:
QUALITY ASSURANCE:	CHARACTERIZATION MANAGER: Frank Miller	OTHER:
FIELD MANAGER:	OTHER:	OTHER: