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CERTIFICATION REPORT FOR AREA 2, PHASE II – SUBAREAS 1, 2, AND 4

FERNALD CLOSURE PROJECT
FERNALD, OHIO

APRIL 2004

U.S. DEPARTMENT OF ENERGY

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REVISION A
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LIST OF ACRONYMS AND ABBREVIATIONS

A2PII	Area 2, Phase II
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	Department of Energy
EPA	Environmental Protection Agency
FCP	Fernald Closure Project
FRL	Final Remediation Level
HAMDC	highest allowable minimum detectable concentration
HPGe	high-purity germanium
MDC	minimum detection concentration
mg/kg	milligrams per kilogram
NaI	Sodium Iodide
OEPA	Ohio Environmental Protection Agency
OSDF	On-site Soil Disposal Facility
OU	Operable Unit
pCi/g	picoCuries per gram
QA/QC	quality assurance/quality control
PSP	Project Specific Plan
RAWP	Remedial Action Work Plan
ROD	Record of Decision
RSS	Radiation Scanning System
RTRAK	Radiation Tracking System
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
TPU	Total Propagated Uncertainty
UCL	Upper Confidence Level
V&V	verification and validation process
V/FCN	Variance/Field Change Notice
VSL	Validation Support Level

EXECUTIVE SUMMARY

This certification report presents the information and data used by the U.S. Department of Energy (DOE) to determine that the existing area-specific constituents of concern (ASCOCs) do not exceed the final remediation levels (FRLs) in Area 2, Phase II (A2PII) – Subareas 1, 2, and 4 at the Fernald Closure Project (FCP). On the basis of this reported information and supporting project files, DOE has determined that no further remedial actions are required in these areas of the site and, therefore, they can be considered "certified." A2PII-Subareas 1, 2, and 4 will be considered certified when the U.S. Environmental Protection Agency (EPA) and Ohio Environmental Protection Agency (OEPA) agree that the certification criteria have been achieved within all forty-five (45) relevant certification units (CUs) into which the area was divided. Upon approval from the regulatory agencies, DOE will proceed with planning the natural resource restoration activities for A2PI- Subareas 1, 2, and 4, as outlined in the Natural Resource Restoration Plan (DOE, 1998a).

A2PII – Subareas 1, 2, and 4 was divided into forty-five (45) CUs. CU delineation is described in the *Certification Design Letter for Area 2, Phase II – Subareas 1, 2, and 4* (DOE, 2003a) and *Project Specific Plan for Area 2, Phase II – Subareas 1, 2, and 4* (DOE, 2003b). Certification sampling was conducted in these areas of the site to verify that the certification criteria were achieved. These criteria state that: 1) the mean concentrations or activities of the primary ASCOCs within a CU are less than the FRLs at the 95 percent upper confidence level (UCL); and 2) no certification result can exceed two-times the FRL (i.e., the hot spot criterion). If either of these criteria is not met, then further investigation and possible excavation is required. If both of these criteria are met for a CU, then it can be released for development of the final land use.

Three areas, the Arsenic Soil Contamination Area, the Former Silos Laydown Area, and the Radium Hot Spot in A2PII – Subareas 1, 2, and 4 were remediated prior to certification of A2PII – Subareas 1, 2, and 4. Consistent with the Sitewide Excavation Plan (SEP, DOE, 1998b), all of A2PII – Subareas 1,2, and 4 underwent precertification activities in 2003, including the use of real-time instrumentation as well as physical sampling and analysis.

A2PII – Subareas 1, 2, and 4 underwent the certification process in early 2004. The results of this process indicated that all of the certification units meet certification criteria. Certification sampling was conducted in each CU to verify that the certification criterion set forth in the SEP were achieved. The certification samples were collected in January and February 2004 and were analyzed at an off-site laboratory that is on the FCP Approved Laboratories List per the Sitewide Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ, DOE, 2002a).

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 existing ASCOC concentrations do not exceed the FRLs within A2PII – Subareas 1, 2, and 4. This report presents final certification results for the CUs identified in the *Certification Design Letter* (CDL) *for Area 2, Phase II – Subareas 1, 2, and 4* (DOE, 2003a). Based on this reported information, the DOE considers remedial goals achieved in this portion of the site.

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 disposition of the excavated material in the On-Site Disposal Facility (OSDF) or an off-site disposal facility if the waste acceptance criteria (WAC) 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 FCP.

In the OU5 Remedial Action Work Plan (RAWP, DOE, 1996b), DOE committed to preparing a Sitewide Excavation Plan (SEP, DOE 1998b), 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 A2PII-Subareas 1, 2, and 4.

After all necessary remediation is completed within each area/phase, the soil will be certified as attaining all clean up goals (i.e., FRLs). The SEP describes the general soil remediation and certification process at the FCP. According to Section 4.1 of the SEP, excavation Approach A was followed in A2PII – Subareas 1, 2, and 4 for the remediation of the Arsenic Soil Contamination Area, the Former Silos Laydown Area, and the Radium Hot Spot since this approach is designed to handle shallow soil excavation that takes place in impacted areas which surround the Former Production Area. The remediation of these areas are discussed in the CDL for A2PII-Subareas 1, 2, and 4 (DOE, 2003a) and the *Implementation Plan for Area 2, Phase II* (DOE, 2003c).

1.3 AREA DESCRIPTION

The focus of this Certification Report is the 63 acre area of A2PII – Subareas 1, 2, and 4, located in the southwest portion of the FCP due south of the Silos Area. See Figure 1-1 for a delineation of the certified area.

Following certification sampling in CUs 26, 27, and 28, which lie along the southern portion of the haul road, this area became a lay down area for supplies that were previously staged in the Silos staging area of Area 7, which is an area covered with clean gravel. Because the supplies were previously staged on clean gravel, CUs 26, 27, and 28 will not be impacted and the supplies will remain in the certification area until they are excessed.

1.4 SCOPE

The scope of this report is limited to the certification of 63 acres in Area 2, Phase II – Subareas 1, 2, and 4, which occurred in January through March 2004. A2PII-Subareas 1, 2, and 4 was divided into forty-five (45) CUs. The certification design for these forty-five (45) CUs follows the general approach outlined in Section 3.4 of the SEP.

1.5 OBJECTIVES

The objectives of this Certification Report are:

- Provide an overview of previous precertification activities conducted in A2PII-Subareas 1, 2, and 4.
- Describe the analytical methods, data validation processes, data reduction and statistical processes used to support the certification process
- Present the certification sampling results for all forty-five (45) CUs within A2PII-Subareas 1, 2, and 4.
- Present the statistical analysis showing that all forty-five (45) CUs have passed the certification criteria, including FRL attainment and hot spot criteria
- Describe access controls implemented to prevent recontamination.

1.6 REPORT FORMAT

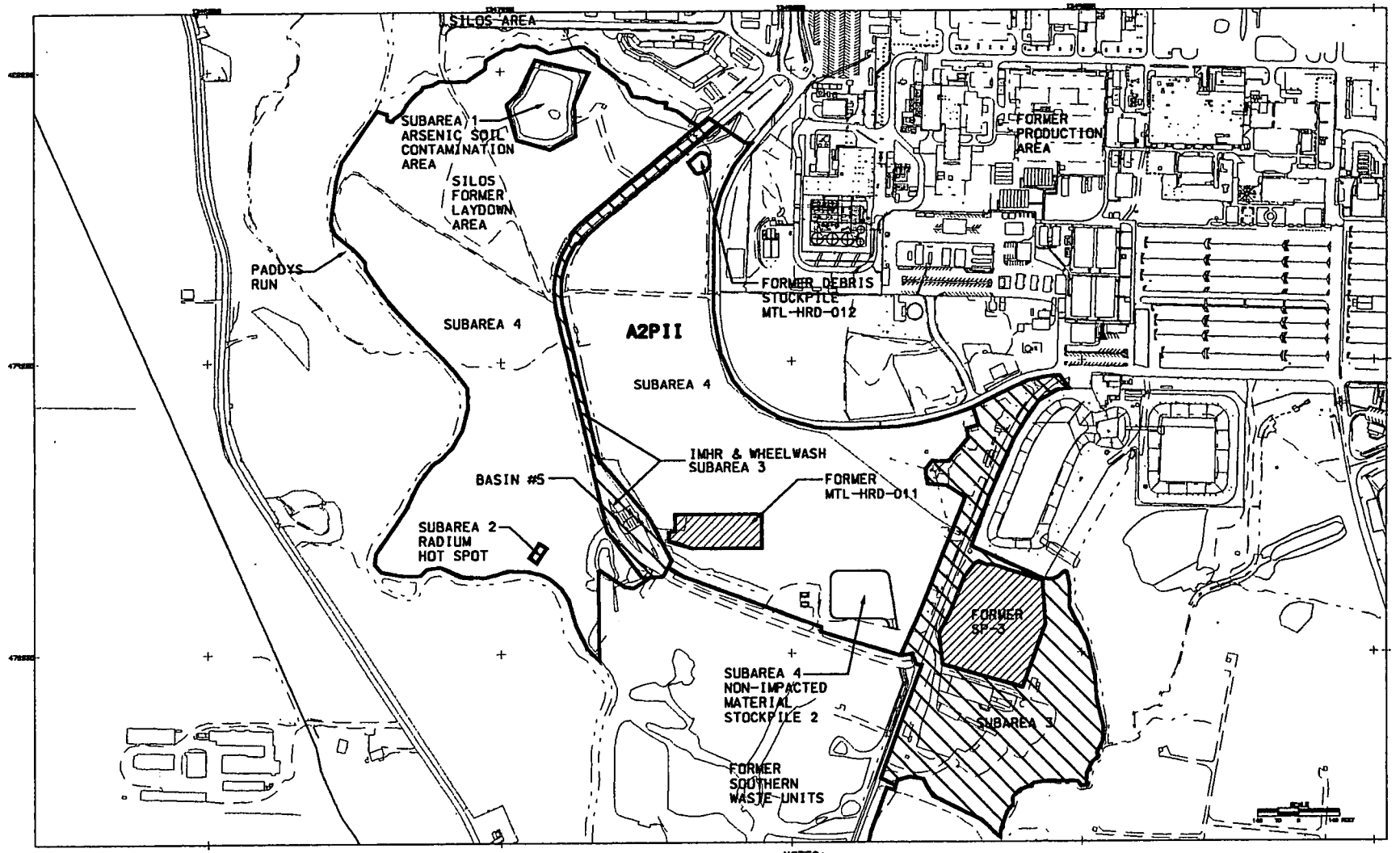
This certification report is presented in six sections with supporting documentation and data in Appendices A and B. The sections of this report area as follows:

Section 1.0	Introduction: Purpose, background, area description, scope, 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 Statistical Tables
Appendix B	Variance/Field Change Notices (V/FCNs) for A2PII-Subareas 1, 2, and 4 Certification Project Specific Plan (PSP)

1.7 FCP CONTROLLED CERTIFICATION MAP

In order to track the status of certification at the FCP, DOE will include a site map showing the status of the soil remediation areas and phased areas with all Certification Reports. This map is included in this Certification Report as Figure 1-2, and has been updated to reflect the status of A2PII-Subareas 1, 2, and 4.



LEGEND:

A2PII BOUNDARY AND SUBAREA BOUNDARIES

CERTIFIED AREA NOT INCLUDED IN AREA2/PHASE II

SUBAREA 3 (NOT IN SCOPE OF THIS CDL)

NOTES:

1) SUBAREA 3 INCLUDES UNDERGROUND UTILITIES AND ASSOCIATED SUBGRADE WITHIN AREA2/PHASE II NOT RELATED TO GROUNDWATER REMEDIATION.

2) UNDERGROUND UTILITIES NOT SHOWN OUTSIDE AREA2/PHASE II BOUNDARY.

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FIGURE 1-1. AREA 2, PHASE II - SUBAREAS 1, 2, AND 4 LOCATION MAP

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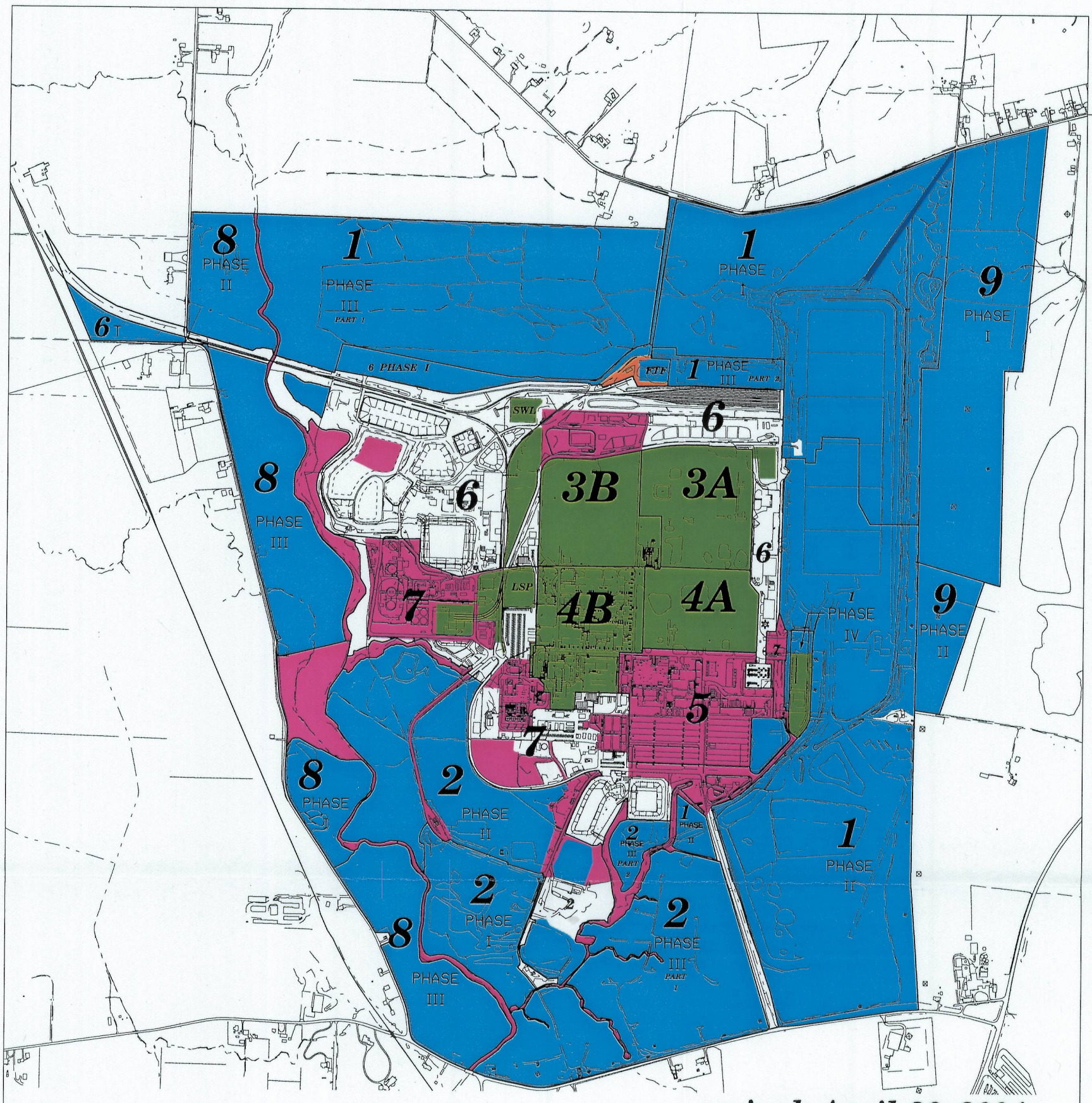

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AREAS	TOTAL ACRES	APPROVED CERT. ACRES	CERT. ACRES IN PROGRESS	REMEDIATION ACRES IN PROGRESS	PREDESIGN ACRES IN PROGRESS	REMAINING ACRES
AREA 1	394.6	391.1	0	3.3	0	0.2
AREA 2	175.0	160.8	0	0	6.7	7.5
AREA 3A/4A	41.5	0	0	41.5	0	0
AREA 3B/4B	47.8	0	0	47.8	0	0
AREA 5	31.8	3.2	0	0	28.6	0
AREA 6	142.0	18.8	1.4	7.7	11.5	102.6
AREA 7	84.9	0	0	7.2	39.4	38.2
AREA 8	98.9	98.9	0	0	0	0
AREA 9	7.0	0	0	0	0	0.75*
PR/SSOD/PPDD	32.3	0	0	0	32.3	0
TOTAL ON SITE	1049.5	672.2	1.4	107.5	118.5	149.3
AREA 9	90.8	84.5	0	0	0	6.3
TOTAL OFF SITE	90.8	84.5	0	0	0	6.3

* 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

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2.0 CERTIFICATION APPROACH

2.1 CERTIFICATION STRATEGY

This section summarizes the ASCOC selection process and the certification approach, including CU establishment, sampling design, and statistical analysis. The general purpose of certification sampling is to verify that the mean concentrations or activities of primary ASCOCs remaining in the soil of a CU following remedial activities are less than the FRLs at the 95 percent UCL, and at the 90 percent UCL for secondary ASCOCs. This certification process also includes the hot spot criterion, which states that if any of the certification results exceeds two times the FRL, further action is required, as discussed in Section 3.4.5 of the SEP. If the mean residual ASCOC concentrations or activities are below the FRLs within the respective confidence bounds, and the hot spot criterion is met, then the remedial objectives have been achieved for the CU. It can then be released for regrading, reseeding and development of a final land use. The general certification strategy is described in Section 3.4 of the SEP, and in the specific strategy as described in the CDL/PSP for A2PII-Subareas 1, 2, and 4 (2003a and b).

The general certification strategy is described in Section 3.4 of the SEP, and the area specific strategy is described in the CDL for A2PII-Subareas 1, 2, and 4 (2003a).

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 certification area was also sampled for the secondary ASCOCs, arsenic and beryllium.

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

Total uranium, radium-226, radium-228, thorium-228 and thorium-232 are sitewide primary COCs and were therefore retained as ASCOCs. In addition, arsenic and beryllium were retained as secondary ASCOCs due to the above-FRL results found in Area 2, Phase II during pre-design activities.

2.2 CERTIFICATION APPROACH

2.2.1 Certification Design

The certification design for A2PII-Subareas 1, 2, and 4 followed the general approach outlined in Section 3.4 of the SEP. Since A2PII-Subareas 1, 2, and 4 required shallow soil excavation in impacted areas surrounding the Former Production Area," Approach A from the SEP will be used as a basis for certification design, as described in Section 4.1 of the SEP. Historical land uses, soil COC data, predesign and precertification data, and topography were used to establish CU boundaries. As shown in Figure 2-1, 45 CUs were established in A2PII-Subareas 1, 2, and 4 and they were all Group 1 CUs.

The 45 Group 1 CUs were established as follows:

• CU A2P2-1	Arsenic Soil Contamination Area (ASCA)
• CUs A2P2-2 thru 6	surrounding ASCA
• CU A2P2-7	Former Silos Laydown Area
• CUs A2P2-8 thru -13	CUs west of gravel access road
• CU A2P2-14	Gravel road next to Former Silos Laydown Area
• CUs A2P2-15 thru -20	CUs west of Impacted Materials Haul Road
• CUs A2P2-21 thru -24	surrounding Radium Hot Spot CU A2P2-25
• CU A2P2-25	Radium Hot Spot CU
• CU A2P2-26, -27, and -28	CUs along Impacted Materials Haul Road
• CUs A2P2-29, -30, and -31	CUs east of Impacted Materials Haul Road
• CU A2P2-32	CU containing NIMS2
• CUs A2P2-33 thru -44	CUs east of Impacted Materials Haul Road
• CU A2P2-45	CU containing footprint of MTL-HRD-012

2.2.2 Sample Selection Process

Certification sampling locations were selected 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 the minimum distance criteria were met for all 16 random sampling locations. All sub-CUs and planned A2PII-Subareas 1, 2, and 4 certification sampling locations are shown in Figures 2-2 through 2-6.

2.2.3 Certification Sampling

Each sample was collected from the 0 to 6-inch (surface) soil interval at the designated and surveyed location. Four of the 16 certification locations per CU (one per each quadrant of the CU) were randomly selected for archiving (identified in the field, but not collected), and the other 12 locations were submitted for analysis. All samples were analyzed at an off-site laboratory for the five primary ASCOCs using the gamma spectrometry method. Additional information regarding the certification sampling and analysis may be obtained from the *A2PII-Subareas 1, 2, and 4 Certification PSP* (2003b).

Samples were collected for certification in 2002 and 2003 for CU 32 (Non-Impacted Materials Stockpile 2) and CU 25 (Radium Hot Spot) respectively due to field conditions. A full discussion on these sampling events can be found in Section 4.1.2 of the CDL for A2PII- Subareas 1, 2, and 4 (2003a).

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(s) does exceed the associated FRL, then statistical analyses will 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 (90% UCL for secondary COCs) resulting in the pass/fail decision on each individual CU. 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 this 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 all 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 hot spot criterion is met, the CU will be considered certified.

TABLE 2-1

ASCOC LIST FOR ALL A2PII-SUBAREAS 1, 2, AND 4 CERTIFICATION UNITS

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 secondary ASCOC
Beryllium	1.5 mg/kg	Retained as secondary ASCOC

mg/kg – milligrams per kilogram
pCi/g – picoCuries per gram

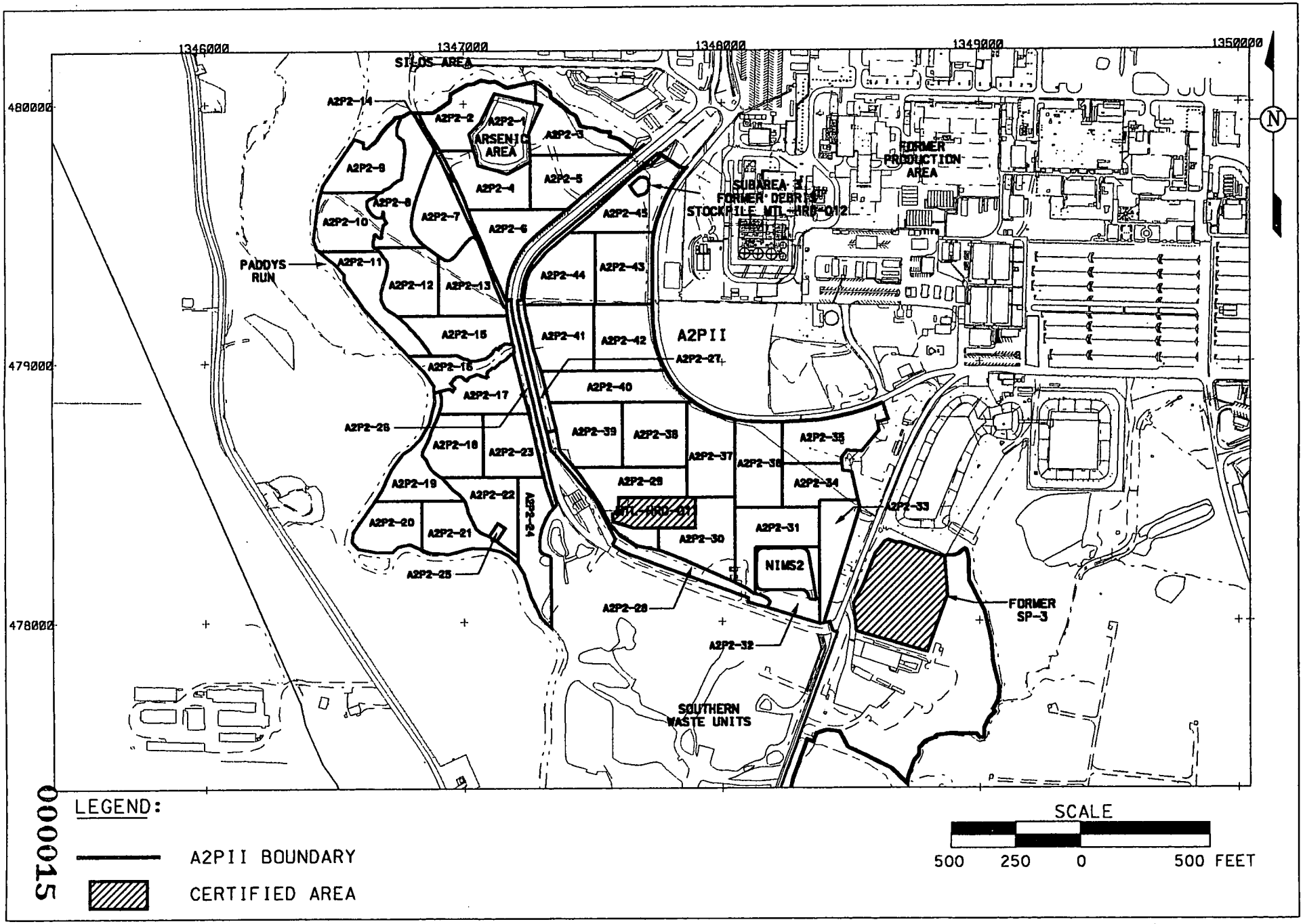

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FIGURE 2-1. A2PII-SUBAREAS 1, 2 AND 4 CERTIFICATION UNIT DESIGN

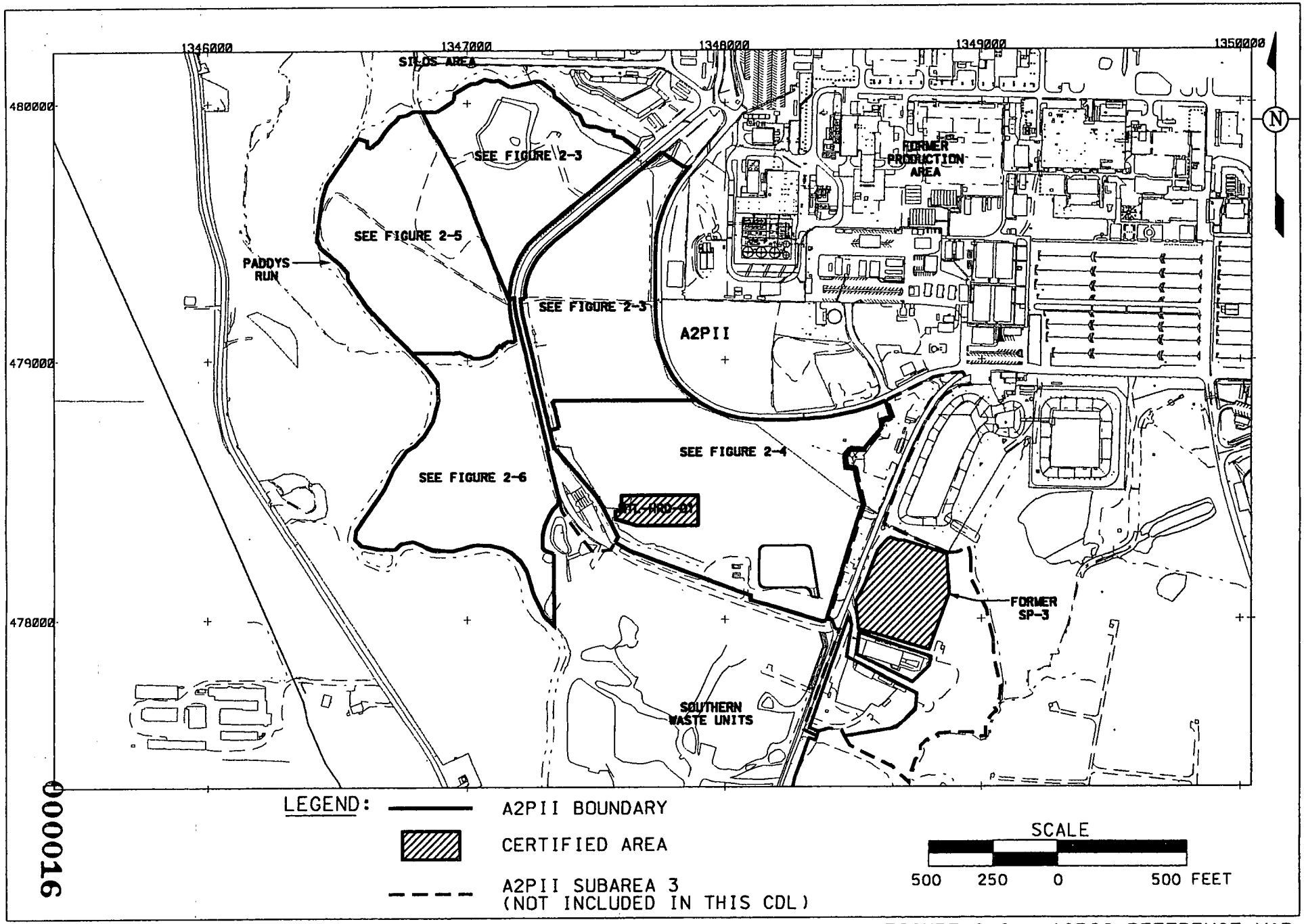

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FIGURE 2-2. A2PII REFERENCE MAP

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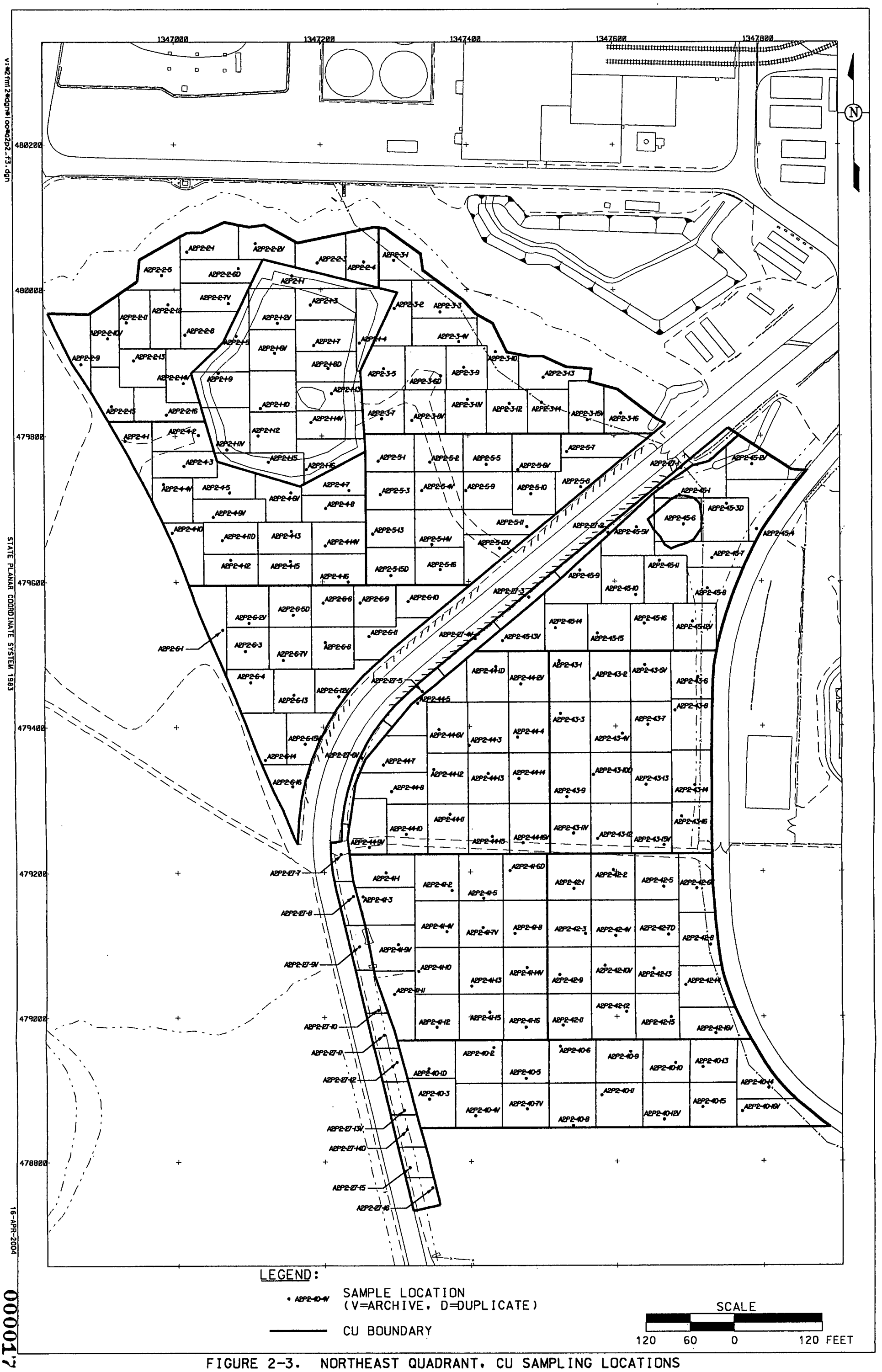

FIGURE 2-3. NORTHEAST QUADRANT, CU SAMPLING LOCATIONS

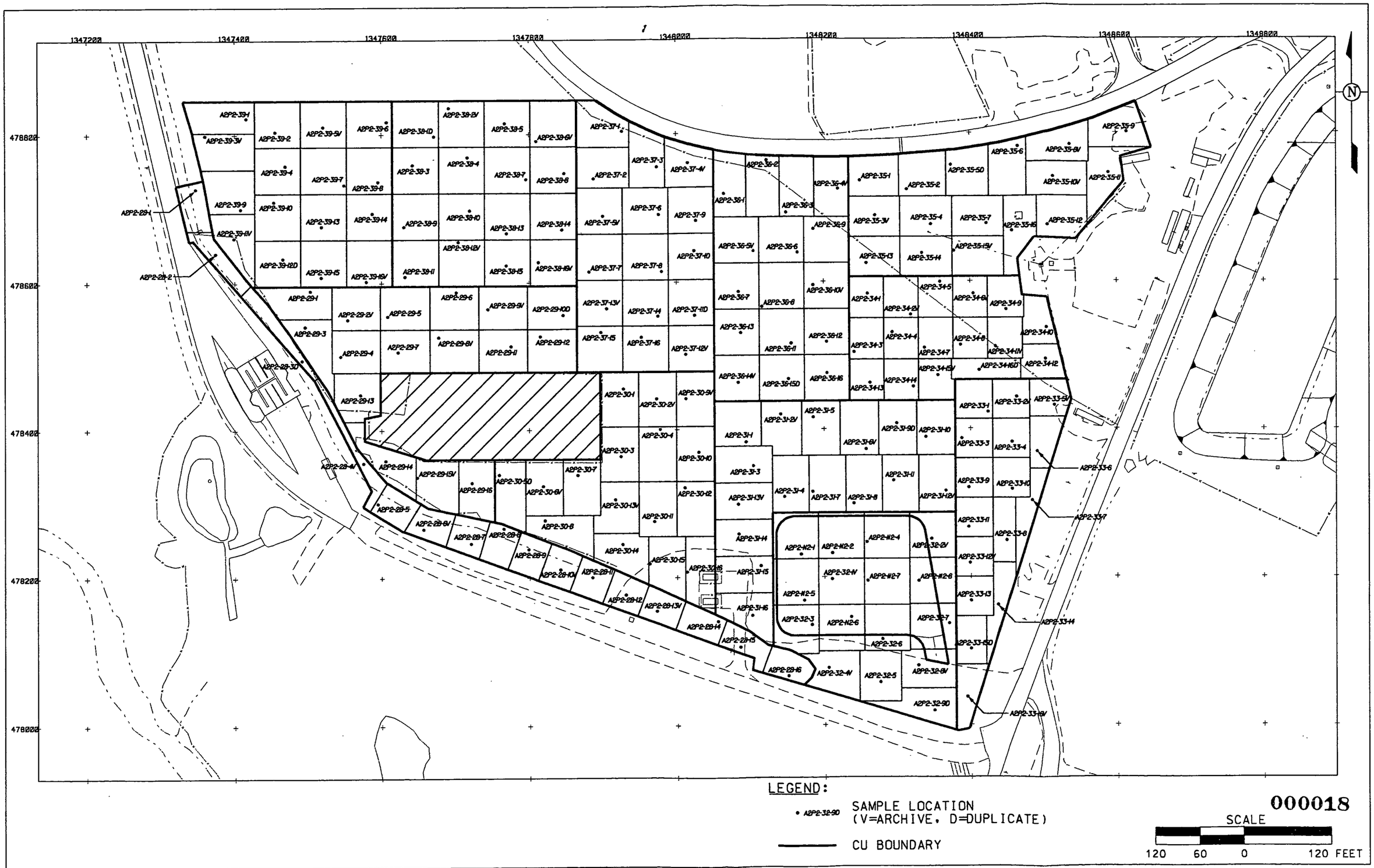

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FIGURE 2-4. SOUTHEAST QUADRANT, CU SAMPLING LOCATIONS

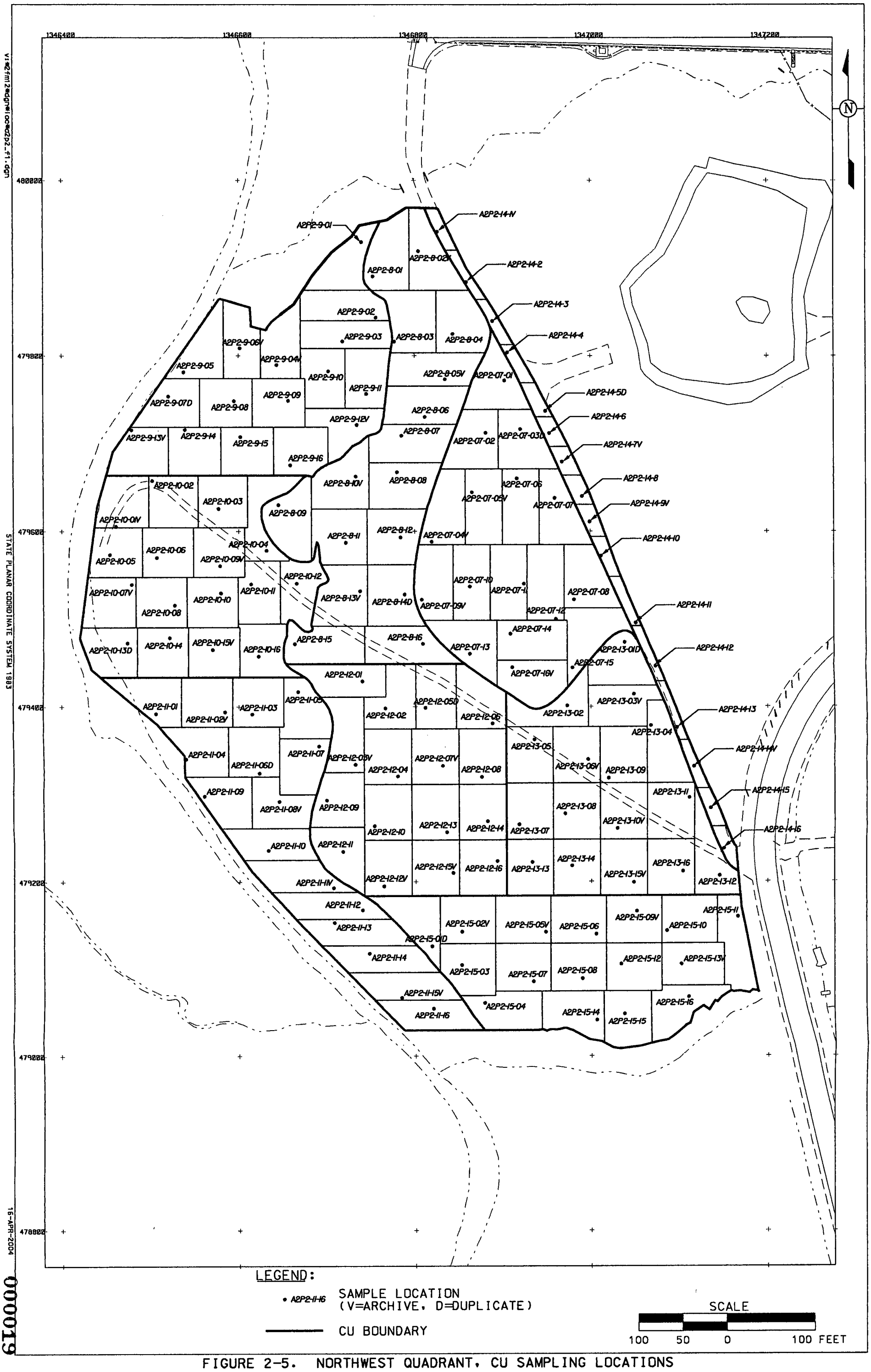

FIGURE 2-5. NORTHWEST QUADRANT, CU SAMPLING LOCATIONS

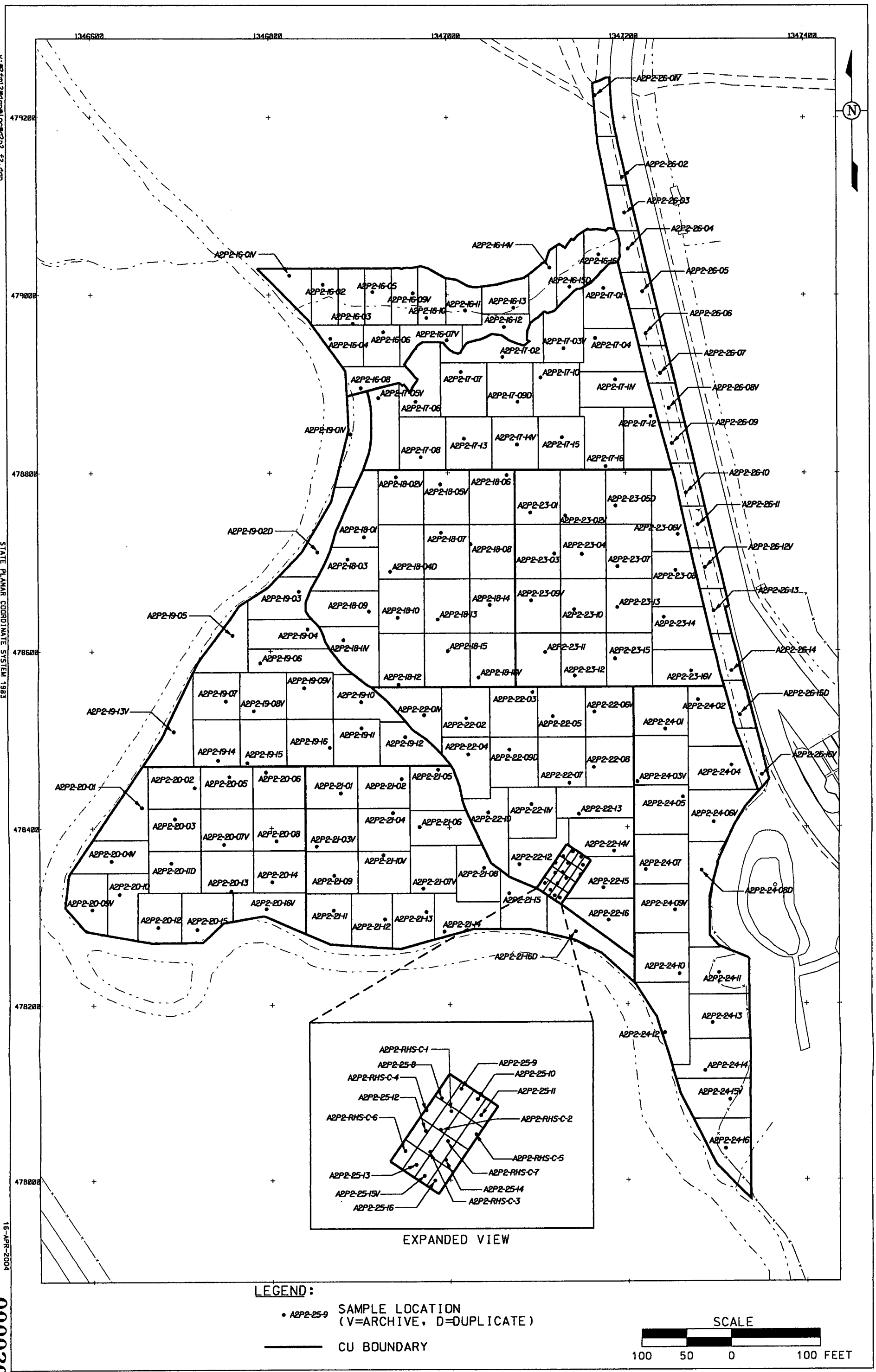

FIGURE 2-6. SOUTHWEST QUADRANT, CU SAMPLING LOCATIONS

3.0 OVERVIEW OF FIELD ACTIVITIES

3.1 DATA EVALUATION AND PRECERTIFICATION

According to guidelines established in Section 3.3.3 of the SEP, precertification activities are conducted to evaluate residual radiological contamination patterns. All Real-time Predesign results for A2PII-Subareas 1, 2, and 4 were used as Precertification data. Predesign and precertification real-time scanning both use the same measurement method of high-purity germanium (HPGe) scanning at 1 meter. Since none of the scans were above three times FRL and the area has had no activity since the scan, the real-time data was used for Precertification.

The total population of the data used to support the conclusion that the area is ready for certification consisted of predesign data for the areas that required no remedial action and precertification data from the excavated/remediated footprints.

3.2 CHANGES TO SCOPE OF WORK

The scope of work for A2PII-Subareas 1, 2, and 4 certification sampling was documented in the final CDL. Only one change was made to the PSP and the V/FCN documenting this change has been attached in Appendix B of this document. This V/FCN, 20450-PSP-0004-1, documents the movement of two boring locations by more than three feet. Per the SEP, relocation of any sample point beyond 3 feet requires documentation in a V/FCN.

4.0 ANALYTICAL METHODOLOGIES, DATA VALIDATION PROCESSES AND DATA REDUCTION

4.1 ANALYTICAL METHODOLOGIES

Radiological samples were analyzed at an off-site laboratory, which complies 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 an approved analytical method, as discussed in Appendix H of the SEP. Analyses were conducted to analytical support level (ASL) D or E, where the minimum detection level of 10 percent of the FRL is above the SCQ ASL detection level, but the analyses meet other SCQ ASL D criteria. An ASL D data package was provided for all of the data. All of the data were validated. Certification analytical results are provided in Appendix A, and a summary of the analytical methods follows.

4.1.1 Chemical Methods

The only chemical analysis performed was for the metals, arsenic and beryllium. The method used was inductively coupled plasma-atomic emission spectrometry (ICP-AES).

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 percent recovery for duplicate samples were specified for each analyte. Laboratories were required to meet these specifications using the methodologies described below.

Total Uranium

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

$$\text{Total Uranium (mg/kg)} = (2.998544) \times \text{Uranium-238 gamma spectrometry result (pCi/g)}$$

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

Radium-226

Samples were analyzed by gamma spectrometry, 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 A2PII-Subareas 1, 2, and 4 certification results.

Radium-228

Following gamma spectrometry 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 A2PII-Subareas 1, 2, and 4 CUs.

Isotopic Thorium

Isotopic thorium (Th-228 and Th-232) was quantified by measuring gamma rays emitted by members of its decay chain by gamma spectrometry. The off-site laboratory used the same gamma ray emission lines and error weighted average methodology to calculate all A2PII-Subareas 1, 2, and 4 CUs.

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 the 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 level of confidence of the results. General areas examined include the following:

- Holding times
- Instrument calibrations
- Calculation of results
- Laboratory/field duplicate precision
- Field/Laboratory Blank contamination
- Dry weight correction for solid samples
- Correct detection limits reported
- Laboratory control sample (LCS) 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. Per project requirements, a minimum 10 percent of the certification data were validated to Validation Support Level (VSL) D. This validation included the same review process as for VSL B, but included a systematic review of the raw data and recalculations. To meet this project requirement (as specified in the SEP and Data Quality Objectives SL-052), all analyses from five randomly selected CUs (A2P2-C5, A2P2-C14, A2P2-C30, A2P2-C38, and A2P2-C42) were validated to VSL D, and the remaining data were validated to VSL B.

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

-	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 judgment of the interpretation of the supporting data, such as mass spectra. Caution must be exercised with the use of this data.

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. All the results were either not qualified (-) or qualified as estimated (J). No results were qualified as rejected.

4.3 DATA REDUCTION

Each sample used to support the A2PII-Subareas 1, 2, and 4 area certification decision was entered in the FCP Sitewide Environmental Database (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 a location.

Laboratory Information

For each sample result the following information is 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 minimum detectable concentration (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 each 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 highest 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

Certification success or failure was based on sample data from each CU against criteria discussed in Section 2.2.4. Subsequent to any evaluation of preliminary data, full statistical analysis and evaluation was performed on all validated data. Final certification data are presented in Appendix A.

5.1 CERTIFICATION RESULTS AND EVALUATION

All 45 CUs for A2PII-Subareas 1, 2, and 4 passed the certification criteria. Final certification data are presented in Appendix A. Based on these results, DOE has determined that the remedial objectives of the OU5 ROD have been achieved in A2PII-Subareas 1, 2, and 4, and no further remedial actions are required. The subject areas will be released for final land use.

5.2 A2PII-SUBAREAS 1, 2, AND 4 CERTIFICATION CONCLUSIONS

Based on the sampling results and statistical analyses presented in this report, DOE has determined that the remedial objectives in the OU5 ROD have been achieved in A2PII-Subareas 1, 2, and 4. Therefore, upon U.S. Environmental Protection Agency and Ohio Environmental Protection Agency concurrence, DOE has determined that no further remedial actions are required in Area 2, Phase II-Subareas 1, 2, and 4 and that the certification activities for A2PII-Subareas 1, 2, and 4 are complete.

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 being recontaminated.

The procedure is summarized as follows:

- Prior to the initiation of certification sampling activities for a remediation area, temporary fencing will be installed to delineate the perimeter of the "certified" area if existing fencing is not already present.
- Signs will be posted upon the temporary perimeter limiting access to authorized individuals or projects.
- Personnel desiring admittance to a "certified" area to conduct work will submit a written request to gain access, using Form FS-F-4878, to the Soil and Disposal Facility Project Compliance Section.
- The purpose of entry must be described on the form, including any proposed chemical applications such as pesticides or herbicides.
- Any equipment to be used within the "certified" area must have been cleaned in accordance with FCP certified area access.
- Employees/operators should be briefed on the entry and exit requirements for a "certified" area.
- Additional restrictions apply to certified areas that have been restored. The SDFP Compliance section will forward access requests for restored areas to SDFP Natural Resources for written approval prior to entry.

After DOE, EPA and OEPA agree that an area is certified, the area will be released for final land use. At that time, best management practices and administrative controls will need to be used to protect the area from contamination, and other controls will be implemented as needed. Following approval of this certification report by the EPA and OEPA, DOE will proceed with planning the natural resource restoration and development of final land use for the area.

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APPENDIX A

CERTIFICATION SAMPLES, ANALYTICAL RESULTS AND STATISTICS TABLES

CERTIFICATION UNIT 1

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C1-1	0.997 -	0.925 J	0.938 -	0.925 -	4.77 -	9.37 J	0.533 -
A2P2-C1-3	1.10 -	0.834 J	0.836 -	0.834 -	6.22 -	4.20 J	0.596 -
A2P2-C1-4	0.975 -	0.923 J	1.11 -	0.923 -	4.64 -	2.36 J	0.497 -
A2P2-C1-5	1.26 -	1.23 J	1.24 -	1.23 -	6.57 -	10.4 J	0.735 -
A2P2-C1-7	0.911 -	0.780 J	0.793 -	0.780 -	3.87 -	2.48 J	0.615 -
A2P2-C1-8	0.928 -	0.808 J	0.827 -	0.808 -	3.42 -	4.71 J	0.808 -
A2P2-C1-8-D	0.845 -	0.757 J	0.776 -	0.757 -	4.64 -	8.24 J	0.591 -
A2P2-C1-9	0.959 -	1.00 J	1.01 -	1.00 -	4.58 -	9.72 J	0.741 -
A2P2-C1-10	0.886 -	0.840 J	0.843 -	0.840 -	4.80 -	7.91 J	0.745 -
A2P2-C1-12	1.03 -	1.04 J	1.06 -	1.04 -	5.74 -	8.94 J	0.758 -
A2P2-C1-13	0.585 -	0.530 J	0.539 -	0.530 -	2.62 -	9.37 J	0.368 -
A2P2-C1-15	1.36 -	1.25 J	1.27 -	1.25 -	6.76 -	11.2 J	0.954 -
A2P2-C1-16	1.11 -	0.948 J	0.963 -	0.948 -	8.94 -	16.5 J	0.665 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.36	1.25	1.27	1.25	8.94	16.5	0.954
Max. >= Limit	No	No	No	No	No	Yes	No
W-statistic Prob. *	--	--	--	--	--	31.3% (N)	--
Test Procedure	--	--	--	--	--	Normal	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	8.39	--
UCL	--	--	--	--	--	9.94	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	pass	--
a posteriori Sample	--	--	--	--	--	7	--
Size calculation	--	--	--	--	--	Pass	--

Footnotes for Appendix A

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

* W - Statistic Probability is the highest reported probability 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 (N) and the log-transformed data (LN) to test for lognormality.

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

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CERTIFICATION UNIT 2

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C2-1	0.955 -	0.955 -	0.975 -	0.955 -	22.4 -	4.97 -	0.477 -
A2P2-C2-3	0.945 -	0.834 -	0.852 -	0.834 -	27.8 -	5.87 -	0.487 -
A2P2-C2-4	0.872 -	0.822 -	0.820 -	0.822 -	23.0 -	10.9 -	0.546 -
A2P2-C2-5	0.913 -	0.977 -	0.987 -	0.977 -	23.3 -	4.88 -	0.464 -
A2P2-C2-6	0.907 -	0.920 -	0.907 -	0.920 -	15.6 -	8.58 -	0.537 -
A2P2-C2-6-D	0.927 -	0.893 -	0.939 -	0.893 -	15.2 -	5.68 -	0.527 -
A2P2-C2-8	1.04 -	0.950 -	0.956 -	0.950 -	21.4 -	5.10 -	0.472 -
A2P2-C2-9	0.962 -	0.796 -	0.802 -	0.796 -	22.2 -	6.73 -	0.617 -
A2P2-C2-11	0.986 -	0.915 -	0.930 -	0.915 -	20.5 -	4.05 -	0.396 -
A2P2-C2-12	1.05 -	0.866 -	0.937 -	0.866 -	16.3 -	4.52 -	0.441 -
A2P2-C2-13	0.991 -	0.981 -	1.01 -	0.981 -	18.0 -	4.26 -	0.424 -
A2P2-C2-15	1.26 -	1.22 -	1.25 -	1.22 -	24.0 -	9.12 -	0.756 -
A2P2-C2-16	0.941 -	0.975 -	1.02 -	0.975 -	22.3 -	4.87 -	0.451 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.26	1.22	1.25	1.22	27.8	10.9	0.756
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--

a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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CERTIFICATION UNIT 3

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C3-1	1.06 -	0.909 -	0.914 -	0.909 -	12.1 -	14.0 -	0.453 -
A2P2-C3-2	0.864 -	0.807 -	0.802 -	0.807 -	22.7 -	3.28 -	0.324 -
A2P2-C3-3	0.949 -	0.893 -	0.909 -	0.893 -	16.8 -	1.32 -	0.481 -
A2P2-C3-5	0.900 -	0.832 -	0.852 -	0.832 -	27.2 -	1.88 -	0.340 -
A2P2-C3-6	1.02 -	0.913 -	0.923 -	0.913 -	8.40 -	1.85 -	0.495 -
A2P2-C3-6-D	1.12 -	0.900 -	0.904 -	0.900 -	9.88 -	1.54 -	0.437 -
A2P2-C3-7	1.11 -	1.01 -	1.04 -	1.01 -	8.48 -	2.63 -	0.453 -
A2P2-C3-9	1.01 -	0.997 -	1.01 -	0.997 -	8.50 -	1.45 -	0.459 -
A2P2-C3-10	0.862 -	0.816 -	0.818 -	0.816 -	15.7 -	1.44 -	0.331 -
A2P2-C3-12	0.822 -	0.879 -	0.879 -	0.879 -	33.6 -	2.02 -	0.341 -
A2P2-C3-13	0.995 -	0.930 -	0.945 -	0.930 -	32.5 -	1.65 -	0.303 -
A2P2-C3-14	0.869 -	0.811 -	0.824 -	0.811 -	25.4 -	1.79 -	0.344 -
A2P2-C3-16	0.951 -	0.890 -	0.908 -	0.890 -	34.9 -	1.52 -	0.319 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.12	1.01	1.04	1.01	34.9	14	0.495
Max. >= Limit	No	No	No	No	No	Yes	No
W-statistic Prob. *	--	--	--	--	--	< 0.01% (LN)	--
Test Procedure	--	--	--	--	--	Median (Sign)	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	1.82	--
UCL	--	--	--	--	--	2.02	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	Pass	--

a posteriori Sample	--	--	--	--	--	5	--
Size calculation	--	--	--	--	--	Pass	--

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CERTIFICATION UNIT 4

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C4-1	1.53 J	0.952 -	0.947 -	0.952 -	35.9 J	4.07 -	0.464 -
A2P2-C4-2	1.02 J	0.867 -	0.893 -	0.867 -	12.8 J	5.25 -	0.448 -
A2P2-C4-3	1.05 J	0.947 -	0.943 -	0.947 -	15.3 J	4.45 -	0.432 -
A2P2-C4-5	1.24 J	0.951 -	0.960 -	0.951 -	22.8 J	4.84 -	0.515 -
A2P2-C4-7	1.05 J	0.892 -	0.882 -	0.892 -	9.73 J	7.83 -	0.524 -
A2P2-C4-8	0.940 J	0.994 -	1.03 -	0.994 -	25.5 J	8.55 -	0.631 -
A2P2-C4-10	0.868 J	0.826 -	0.839 -	0.826 -	13.1 J	3.51 -	0.432 -
A2P2-C4-11	1.74 J	1.33 -	1.34 -	1.33 -	39.9 J	4.79 -	0.517 -
A2P2-C4-11-D	2.30 J	1.53 -	1.53 -	1.53 -	53.9 J	5.06 -	0.580 -
A2P2-C4-12	1.47 J	0.983 -	0.981 -	0.983 -	60.6 J	4.78 -	0.595 -
A2P2-C4-13	1.13 J	0.953 -	0.954 -	0.953 -	19.7 J	5.14 -	0.594 -
A2P2-C4-15	1.09 J	1.03 -	1.03 -	1.03 -	35.7 J	5.98 -	0.501 -
A2P2-C4-16	1.32 J	1.03 -	1.02 -	1.03 -	23.7 J	8.86 -	0.636 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	2.3	1.53	1.53	1.53	60.6	8.86	0.636
Max. >= Limit	Yes	No	No	Yes	No	No	No
W-statistic Prob. *	21.4% (LN)	--	--	< 0.01% (LN)	--	--	--
Test Procedure	Lognormal	--	--	Median (Sign)	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	1.25	--	--	0.95	--	--	--
UCL	1.45	--	--	1.03	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	pass	--	--	Pass	--	--	--
a posteriori Sample	6	--	--	7	--	--	--
Size calculation	Pass	--	--	Pass	--	--	--

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CERTIFICATION UNIT 5

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C5-1	1.04 J	0.876 -	0.909 -	0.876 -	36.9 -	3.81 -	0.373 -
A2P2-C5-2	1.05 J	0.948 -	0.968 -	0.948 -	22.7 -	2.95 -	0.484 -
A2P2-C5-3	1.01 J	0.950 -	0.976 -	0.950 -	34.1 -	6.72 -	0.399 -
A2P2-C5-5	1.21 J	1.03 -	1.03 -	1.03 -	28.7 -	5.56 -	0.429 -
A2P2-C5-7	0.873 J	0.859 -	0.877 -	0.859 -	34.2 -	2.32 J	0.382 -
A2P2-C5-8	1.10 J	1.12 -	1.16 -	1.12 -	20.7 -	8.50 -	0.512 -
A2P2-C5-9	1.02 J	0.956 -	0.956 -	0.956 -	29.3 -	3.76 -	0.426 -
A2P2-C5-10	1.10 J	1.02 -	1.05 -	1.02 -	10.2 -	3.87 -	0.559 -
A2P2-C5-11	1.40 J	1.13 -	1.13 -	1.13 -	12.3 -	6.71 -	0.505 -
A2P2-C5-13	1.12 J	1.15 -	1.12 -	1.15 -	27.4 -	21.5 -	0.690 -
A2P2-C5-15	1.10 J	1.08 -	1.09 -	1.08 -	21.6 -	6.94 -	0.488 -
A2P2-C5-15-D	1.38 J	1.07 -	1.08 -	1.07 -	24.4 -	6.36 -	0.541 -
A2P2-C5-16	1.07 J	1.07 -	1.07 -	1.07 -	26.4 -	6.43 -	0.516 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.4	1.15	1.16	1.15	36.9	21.5	0.69
Max. >= Limit	No	No	No	No	No	Yes	No
W-statistic Prob. *	--	--	--	--	--	9.0% (LN)	--
Test Procedure	--	--	--	--	--	Lognormal	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	6.84	--
UCL	--	--	--	--	--	8.75	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	pass	--

a posteriori Sample	--	--	--	--	--	4	--
Size calculation	--	--	--	--	--	Pass	--

0000035

5436

CERTIFICATION UNIT 6

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C6-1	1.02 -	0.977 -	0.990 -	0.977 -	45.3 -	3.83 -	0.500 -
A2P2-C6-3	1.08 -	0.969 -	0.970 -	0.969 -	36.9 -	4.46 -	0.591 -
A2P2-C6-4	1.29 -	1.22 -	1.26 -	1.22 -	82.0 -	5.58 -	0.644 -
A2P2-C6-5	1.30 -	1.07 -	1.09 -	1.07 -	31.9 -	11.8 -	0.718 -
A2P2-C6-5-D	1.27 -	1.03 -	1.15 -	1.03 -	33.0 -	8.64 -	0.603 -
A2P2-C6-6	1.06 -	1.04 -	1.02 -	1.04 -	24.6 -	12.3 -	0.560 -
A2P2-C6-8	1.20 -	1.13 -	1.13 -	1.13 -	39.8 -	8.54 -	0.663 -
A2P2-C6-9	1.29 -	1.08 -	1.10 -	1.08 -	30.3 -	6.58 -	0.599 -
A2P2-C6-10	1.07 -	1.13 -	1.16 -	1.13 -	34.4 -	5.35 -	0.458 -
A2P2-C6-11	1.08 -	0.974 -	0.957 -	0.974 -	29.6 -	5.73 -	0.462 -
A2P2-C6-13	1.10 -	0.948 -	0.939 -	0.948 -	21.5 -	10.5 -	0.735 -
A2P2-C6-14	1.11 -	0.963 -	0.957 -	0.963 -	23.4 -	4.50 -	0.469 -
A2P2-C6-16	1.16 -	1.04 -	1.05 -	1.04 -	50.9 -	5.60 -	0.531 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.3	1.22	1.26	1.22	82	12.3	0.735
Max. >= Limit	No	No	No	No	Yes	Yes	No
W-statistic Prob. *	--	--	--	--	51.8% (LN)	38.5% (LN)	--
Test Procedure	--	--	--	--	Lognormal	Lognormal	--
Sample Size	12	12	12	12	12	13	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	37.63	7.22	--
UCL	--	--	--	--	47.10	8.51	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	pass	pass	--

a posteriori Sample	--	--	--	--	3	3	--
Size calculation	--	--	--	--	Pass	Pass	--

000036

5436

CERTIFICATION UNIT 7

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C7-1	1.17 J	0.963 -	0.975 -	0.963 -	38.8 J	5.54 -	0.603 -
A2P2-C7-2	1.55 J	1.18 -	1.19 -	1.18 -	5.48 J	10.8 -	0.949 -
A2P2-C7-3	1.19 J	1.06 -	1.05 -	1.06 -	0.033 U	5.10 -	0.527 -
A2P2-C7-3-D	1.44 J	1.09 -	1.05 -	1.09 -	8.79 J	5.52 -	0.587 -
A2P2-C7-6	1.13 J	1.06 -	1.06 -	1.06 -	6.47 J	2.81 -	0.459 -
A2P2-C7-7	0.445 J	0.288 -	0.302 -	0.288 -	2.61 J	4.47 -	0.316 -
A2P2-C7-8	1.32 J	1.08 -	1.10 -	1.08 -	5.59 J	2.77 -	0.485 -
A2P2-C7-10	1.17 J	0.947 -	0.938 -	0.947 -	9.36 J	6.60 -	0.622 -
A2P2-C7-11	1.30 J	1.17 -	1.19 -	1.17 -	7.70 J	6.69 -	0.706 -
A2P2-C7-12	1.22 J	1.15 -	1.17 -	1.15 -	4.50 J	3.27 -	0.546 -
A2P2-C7-13	0.953 J	0.888 -	0.906 -	0.888 -	5.98 J	5.33 -	0.462 -
A2P2-C7-14	0.960 J	0.901 -	0.880 -	0.901 -	4.34 J	7.27 -	0.661 -
A2P2-C7-15	1.17 J	1.07 -	1.09 -	1.07 -	10.1 J	4.58 -	0.499 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.55	1.18	1.19	1.18	38.8	10.8	0.949
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	1	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000037

5436

CERTIFICATION UNIT 8

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C8-1	0.669 -	0.524 -	0.525 -	0.524 -	8.52 -	5.12 -	0.291 -
A2P2-C8-3	1.05 -	0.858 -	0.932 -	0.858 -	21.1 -	5.87 -	0.560 -
A2P2-C8-4	1.24 -	1.02 -	1.02 -	1.02 -	19.5 -	4.98 -	0.544 -
A2P2-C8-6	1.13 -	1.10 -	1.11 -	1.10 -	30.2 -	5.77 -	0.556 -
A2P2-C8-7	0.988 -	1.08 -	1.08 -	1.08 -	35.8 -	6.08 -	0.684 -
A2P2-C8-8	1.05 -	1.06 -	1.06 -	1.06 -	42.3 -	6.25 -	0.674 -
A2P2-C8-9	0.704 -	0.655 -	0.648 -	0.655 -	12.5 -	4.33 -	0.389 -
A2P2-C8-11	0.686 -	0.663 -	0.646 -	0.663 -	5.69 -	3.78 -	0.469 -
A2P2-C8-12	1.22 -	1.22 -	1.22 -	1.22 -	12.6 -	8.13 -	0.740 -
A2P2-C8-14	0.548 -	0.456 -	0.458 -	0.456 -	4.16 -	7.49 -	0.203 -
A2P2-C8-14-D	0.524 -	0.399 -	0.389 -	0.399 -	3.10 -	9.70 -	0.217 -
A2P2-C8-15	1.10 -	0.746 -	0.765 -	0.746 -	13.0 -	5.48 -	0.556 -
A2P2-C8-16	1.00 -	0.857 -	0.848 -	0.857 -	6.89 -	5.85 -	0.576 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.24	1.22	1.22	1.22	42.3	9.7	0.74
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000038

5436

CERTIFICATION UNIT 9

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C9-1	0.887 -	0.591 -	0.595 -	0.591 -	22.2 J	5.45 -	0.498 -
A2P2-C9-2	0.711 -	0.601 -	0.598 -	0.601 -	8.64 J	4.92 -	0.353 -
A2P2-C9-3	0.825 -	0.908 -	0.904 -	0.908 -	14.5 J	4.72 -	0.479 -
A2P2-C9-5	0.972 -	0.937 -	0.962 -	0.937 -	5.69 J	5.21 -	0.589 -
A2P2-C9-7	0.887 -	0.882 -	0.904 -	0.882 -	5.74 J	4.23 -	0.504 -
A2P2-C9-7-D	0.979 -	0.920 -	0.959 -	0.920 -	5.97 J	4.97 -	0.559 -
A2P2-C9-8	0.778 -	0.948 -	0.963 -	0.948 -	9.72 J	4.71 -	0.639 -
A2P2-C9-9	1.13 -	0.936 -	0.940 -	0.936 -	13.1 J	4.92 -	0.527 -
A2P2-C9-10	1.18 -	1.16 -	1.14 -	1.16 -	20.7 J	4.89 -	0.555 -
A2P2-C9-11	1.16 -	0.968 -	0.969 -	0.968 -	22.9 J	5.63 -	0.571 -
A2P2-C9-14	0.763 -	0.609 -	0.602 -	0.609 -	10.2 J	4.91 -	0.506 -
A2P2-C9-15	1.06 -	0.911 -	0.929 -	0.911 -	14.5 J	5.06 -	0.576 -
A2P2-C9-16	0.728 -	0.640 -	0.642 -	0.640 -	9.16 J	4.43 -	0.354 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.18	1.16	1.14	1.16	22.9	5.63	0.639
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--

a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000039

5436

CERTIFICATION UNIT 10

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C10-2	0.653 -	0.369 -	0.373 -	0.369 -	7.42 J	4.01 -	0.200 -
A2P2-C10-3	0.795 -	0.654 -	0.656 -	0.654 -	9.29 J	4.05 -	0.391 -
A2P2-C10-4	1.23 -	0.924 -	0.926 -	0.924 -	10.9 J	11.4 -	0.966 -
A2P2-C10-5	0.655 -	0.534 -	0.532 -	0.534 -	2.62 J	3.61 -	0.271 -
A2P2-C10-6	0.863 -	0.643 -	0.656 -	0.643 -	9.78 J	3.24 -	0.385 -
A2P2-C10-8	0.894 -	0.677 -	0.672 -	0.677 -	12.9 J	3.70 -	0.443 -
A2P2-C10-10	0.752 -	0.561 -	0.548 -	0.561 -	15.1 J	3.39 -	0.376 -
A2P2-C10-11	0.809 -	0.550 -	0.548 -	0.550 -	17.5 J	4.30 -	0.423 -
A2P2-C10-12	0.967 -	0.708 -	0.701 -	0.708 -	13.8 J	5.40 -	0.538 -
A2P2-C10-13	1.02 -	0.744 -	0.824 -	0.744 -	3.60 J	4.19 -	0.405 -
A2P2-C10-13-D	0.969 -	0.683 -	0.719 -	0.683 -	0.055 U	4.58 -	0.411 -
A2P2-C10-14	0.965 -	0.804 -	0.803 -	0.804 -	6.26 J	4.71 -	0.516 -
A2P2-C10-16	1.19 -	0.696 -	0.711 -	0.696 -	18.3 J	3.94 -	0.468 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.23	0.924	0.926	0.924	18.3	11.4	0.966
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	1	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000040

5436

CERTIFICATION UNIT 11

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C11-1	0.554 -	0.576 -	0.587 -	0.576 -	4.19 -	3.85 -	0.323 -
A2P2-C11-3	1.06 -	0.942 -	0.963 -	0.942 -	13.9 -	5.93 -	0.547 -
A2P2-C11-4	0.551 -	0.463 -	0.474 -	0.463 -	2.86 -	3.72 -	0.298 -
A2P2-C11-5	0.782 -	0.638 -	0.685 -	0.638 -	10.7 -	4.07 -	0.260 -
A2P2-C11-6	0.704 -	0.725 -	0.749 -	0.725 -	4.98 -	5.06 -	0.535 -
A2P2-C11-6-D	0.736 -	0.675 -	0.687 -	0.675 -	4.08 -	4.90 -	0.546 -
A2P2-C11-7	0.967 -	0.833 -	0.857 -	0.833 -	10.0 -	6.83 -	0.588 -
A2P2-C11-9	0.614 -	0.514 -	0.514 -	0.514 -	4.49 -	3.66 -	0.316 -
A2P2-C11-10	1.10 -	0.962 -	0.958 -	0.962 -	5.85 -	5.19 -	0.621 -
A2P2-C11-12	1.13 -	1.01 -	1.03 -	1.01 -	16.3 -	6.11 -	0.621 -
A2P2-C11-13	1.04 -	0.741 -	0.754 -	0.741 -	4.69 -	5.35 -	0.450 -
A2P2-C11-14	0.780 -	0.709 -	0.759 -	0.709 -	6.14 -	4.77 -	0.422 -
A2P2-C11-16	0.597 -	0.420 -	0.447 -	0.420 -	4.95 -	3.76 -	0.313 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.13	1.01	1.03	1.01	16.3	6.83	0.621
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000041

5436

CERTIFICATION UNIT 12

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C12-1	0.840 -	0.698 -	0.741 -	0.698 -	7.63 -	5.33 -	0.410 -
A2P2-C12-2	1.34 -	1.09 -	1.10 -	1.09 -	22.4 -	8.12 -	0.603 -
A2P2-C12-4	1.50 -	1.09 -	1.11 -	1.09 -	12.2 -	9.63 -	0.737 -
A2P2-C12-5	1.05 -	0.936 -	0.966 -	0.936 -	15.6 -	7.05 -	0.574 -
A2P2-C12-5-D	1.13 -	0.936 -	0.923 -	0.936 -	14.9 -	7.90 -	0.615 -
A2P2-C12-6	1.14 -	1.03 -	1.06 -	1.03 -	22.7 -	8.83 -	0.681 -
A2P2-C12-8	1.22 -	0.990 -	1.01 -	0.990 -	15.0 -	3.94 -	0.474 -
A2P2-C12-9	1.40 -	1.19 -	1.18 -	1.19 -	31.1 -	9.24 -	0.831 -
A2P2-C12-10	1.44 -	1.21 -	1.21 -	1.21 -	23.0 -	8.28 -	0.753 -
A2P2-C12-11	1.24 -	0.999 -	1.00 -	0.999 -	20.3 -	6.72 -	0.625 -
A2P2-C12-13	1.11 -	0.981 -	0.980 -	0.981 -	29.8 -	4.00 -	0.346 -
A2P2-C12-14	1.16 -	0.971 -	0.966 -	0.971 -	22.1 -	3.63 -	0.410 -
A2P2-C12-16	1.04 -	0.945 -	0.949 -	0.945 -	30.7 -	4.71 -	0.458 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.5	1.21	1.21	1.21	31.1	9.63	0.831
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--

a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

0000042

5436

CERTIFICATION UNIT 13

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C13-1	0.813 J	0.486 J	0.489 J	0.486 J	11.8 J	3.79 -	0.281 -
A2P2-C13-1-D	0.638 J	0.414 J	0.409 J	0.414 J	8.58 J	3.22 -	0.224 -
A2P2-C13-2	0.961 J	0.813 J	0.958 J	0.813 J	13.4 J	3.28 -	0.411 -
A2P2-C13-4	0.773 J	0.512 J	0.520 J	0.512 J	9.59 J	3.96 -	0.285 -
A2P2-C13-5	0.728 J	0.344 J	0.375 J	0.344 J	5.08 J	4.21 -	0.223 -
A2P2-C13-7	1.05 J	1.00 J	1.02 J	1.00 J	22.5 J	4.67 -	0.452 -
A2P2-C13-8	1.07 J	0.988 J	1.08 J	0.988 J	20.0 J	4.43 -	0.463 -
A2P2-C13-9	0.932 J	1.05 J	1.06 J	1.05 J	10.1 J	4.60 -	0.476 -
A2P2-C13-11	0.667 J	0.467 J	0.472 J	0.467 J	4.43 J	4.96 -	0.277 -
A2P2-C13-12	0.788 J	0.776 J	0.763 J	0.776 J	12.9 J	6.06 -	0.557 -
A2P2-C13-13	1.09 J	1.01 J	1.01 J	1.01 J	26.2 J	5.07 -	0.499 -
A2P2-C13-14	1.11 J	0.989 J	0.995 J	0.989 J	21.1 J	3.76 -	0.442 -
A2P2-C13-16	1.01 J	0.994 J	1.01 J	0.994 J	25.5 J	3.88 -	0.468 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.11	1.05	1.08	1.05	26.2	6.06	0.557
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--

a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000043

5436

CERTIFICATION UNIT 14

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C14-2	1.08 -	0.990 -	1.01 -	0.990 -	34.2 -	3.31 U	0.460 -
A2P2-C14-3	1.21 -	0.994 -	1.02 -	0.994 -	9.28 -	5.42 -	0.461 -
A2P2-C14-4	1.41 -	1.21 -	1.23 -	1.21 -	51.9 -	4.90 -	0.588 -
A2P2-C14-5	1.08 -	0.983 -	1.01 -	0.983 -	6.24 -	3.33 U	0.478 -
A2P2-C14-5-D	1.18 -	0.953 -	0.978 -	0.953 -	4.28 -	2.62 U	0.428 -
A2P2-C14-6	1.02 -	0.936 -	0.942 -	0.936 -	10.3 -	3.17 U	0.522 -
A2P2-C14-8	0.992 -	0.923 -	0.919 -	0.923 -	8.17 -	2.79 U	0.460 -
A2P2-C14-10	1.05 -	0.828 -	0.814 -	0.828 -	21.7 -	3.86 -	0.547 -
A2P2-C14-11	1.56 -	0.963 -	0.998 -	0.963 -	58.4 -	4.99 -	0.487 -
A2P2-C14-12	2.96 -	1.64 -	1.70 -	1.64 -	124 -	3.77 -	0.561 -
A2P2-C14-13	1.94 -	1.13 -	1.15 -	1.13 -	59.4 -	3.33 U	0.526 -
A2P2-C14-15	1.28 -	0.955 -	0.983 -	0.955 -	15.5 -	2.48 U	0.458 -
A2P2-C14-16	1.34 -	1.28 -	1.28 -	1.28 -	7.06 -	7.52 -	0.962 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	2.96	1.64	1.7	1.64	59.4	7.52	0.962
Max. >= Limit	Yes	No	Yes	Yes	No	No	No
W-statistic Prob. *	3.9% (LN)	--	17.8% (LN)	7.4% (LN)	--	--	--
Test Procedure	Median (Sign)	--	Lognormal	Lognormal	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	7	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%
Est. Mean**	1.25	--	1.09	1.07	--	--	--
UCL	1.56	--	1.21	1.18	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	Pass	--	pass	pass	--	--	--
a posteriori Sample	12	--	3	4	--	--	--
Size calculation	Pass	--	Pass	Pass	--	--	--

000044

5436

CERTIFICATION UNIT 15

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C15-1	0.819 -	0.686 -	0.711 -	0.686 -	16.1 J	4.57 -	0.388 -
A2P2-C15-1-D	0.777 -	0.699 -	0.690 -	0.699 -	18.6 J	4.52 -	0.408 -
A2P2-C15-3	1.03 -	0.895 -	0.906 -	0.895 -	31.3 J	4.68 -	0.411 -
A2P2-C15-4	0.561 -	0.479 -	0.479 -	0.479 -	20.4 J	5.46 -	0.434 -
A2P2-C15-6	1.09 -	0.979 -	0.994 -	0.979 -	30.9 J	4.04 -	0.425 -
A2P2-C15-7	1.04 -	1.02 -	1.04 -	1.02 -	29.5 J	3.84 -	0.417 -
A2P2-C15-8	0.953 -	0.857 -	0.863 -	0.857 -	15.4 J	3.75 -	0.413 -
A2P2-C15-10	1.02 -	0.824 -	0.840 -	0.824 -	19.6 J	4.71 -	0.455 -
A2P2-C15-11	0.851 -	0.661 -	0.666 -	0.661 -	32.5 J	3.61 -	0.286 -
A2P2-C15-12	0.920 -	0.720 -	0.727 -	0.720 -	27.3 J	4.94 -	0.383 -
A2P2-C15-14	1.03 -	1.09 -	1.11 -	1.09 -	20.4 J	5.38 -	0.583 -
A2P2-C15-15	1.07 -	1.05 -	1.07 -	1.05 -	26.1 J	5.33 -	0.608 -
A2P2-C15-16	1.09 -	0.998 -	1.02 -	0.998 -	33.8 J	5.56 -	0.567 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.09	1.09	1.11	1.09	33.8	5.56	0.608
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000045

5436

CERTIFICATION UNIT 16

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C16-2	0.991 -	0.909 -	0.917 -	0.909 -	16.2 -	4.34 -	0.428 -
A2P2-C16-3	0.966 -	0.974 -	0.992 -	0.974 -	13.0 -	5.69 -	0.453 -
A2P2-C16-4	0.804 -	0.590 -	0.603 -	0.590 -	3.78 -	6.19 -	0.439 -
A2P2-C16-5	0.718 -	0.500 -	0.480 -	0.500 -	9.00 -	3.17 -	0.276 -
A2P2-C16-6	0.762 -	0.592 -	0.592 -	0.592 -	11.8 -	5.76 -	0.356 -
A2P2-C16-8	1.30 -	1.13 -	1.19 -	1.13 -	22.9 -	7.45 -	0.583 -
A2P2-C16-10	0.759 -	0.642 -	0.656 -	0.642 -	13.9 -	4.84 -	0.325 -
A2P2-C16-11	0.878 -	0.744 -	0.759 -	0.744 -	12.5 -	3.49 -	0.385 -
A2P2-C16-12	0.737 -	0.518 -	0.519 -	0.518 -	23.0 -	5.11 -	0.299 -
A2P2-C16-13	0.836 -	0.657 -	0.680 -	0.657 -	9.68 -	4.61 -	0.436 -
A2P2-C16-15	0.956 -	0.797 -	0.806 -	0.797 -	37.3 -	5.89 -	0.582 -
A2P2-C16-15-D	0.988 -	0.866 -	0.871 -	0.866 -	41.6 -	6.09 -	0.551 -
A2P2-C16-16	1.28 -	1.04 -	1.06 -	1.04 -	42.1 -	4.78 -	0.563 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.3	1.13	1.19	1.13	42.1	7.45	0.583
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--

a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000046

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CERTIFICATION UNIT 17

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C17-1	0.874 -	0.881 -	0.897 -	0.881 -	28.1 -	4.40 -	0.588 -
A2P2-C17-2	1.10 -	1.05 -	1.06 -	1.05 -	30.4 -	3.54 -	0.407 -
A2P2-C17-4	1.13 -	0.986 -	1.00 -	0.986 -	22.4 -	3.78 -	0.549 -
A2P2-C17-6	0.948 -	1.28 -	1.31 -	1.28 -	15.6 -	7.15 -	0.651 -
A2P2-C17-7	0.999 -	0.967 -	0.960 -	0.967 -	28.6 -	3.52 -	0.413 -
A2P2-C17-8	0.961 -	1.09 -	1.09 -	1.09 -	18.6 -	7.03 -	0.502 -
A2P2-C17-9	0.984 -	1.01 -	1.02 -	1.01 -	19.0 -	3.75 -	0.439 -
A2P2-C17-9-D	0.899 -	0.945 -	0.963 -	0.945 -	16.8 -	4.11 -	0.474 -
A2P2-C17-10	0.809 -	0.938 -	0.943 -	0.938 -	22.6 -	3.50 -	0.478 -
A2P2-C17-12	0.811 -	1.00 -	1.02 -	1.00 -	21.0 -	3.94 -	0.445 -
A2P2-C17-13	1.02 -	1.05 -	1.06 -	1.05 -	16.1 -	5.63 -	0.460 -
A2P2-C17-15	0.820 -	0.987 -	0.990 -	0.987 -	23.4 -	4.03 -	0.405 -
A2P2-C17-16	0.789 -	0.960 -	0.960 -	0.960 -	18.4 -	5.17 -	0.532 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.13	1.28	1.31	1.28	30.4	7.15	0.651
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000047

5436

CERTIFICATION UNIT 18

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C18-1	1.04 J	0.993 J	1.03 -	0.993 J	12.2 J	8.89 -	0.641 -
A2P2-C18-3	0.877 J	0.660 J	0.688 -	0.660 J	13.2 J	7.34 -	0.461 -
A2P2-C18-4	1.02 J	0.888 J	0.880 -	0.888 J	8.11 J	7.99 -	0.490 -
A2P2-C18-4-D	0.725 J	0.717 J	0.767 -	0.717 J	5.49 J	7.41 -	0.432 -
A2P2-C18-6	1.07 J	1.16 J	1.18 -	1.16 J	23.2 J	9.05 -	0.612 -
A2P2-C18-7	1.17 J	1.10 J	1.10 -	1.10 J	10.7 J	8.64 -	0.687 -
A2P2-C18-8	1.45 J	1.22 J	1.20 -	1.22 J	24.3 J	9.22 -	0.761 -
A2P2-C18-9	1.16 J	0.893 J	0.902 -	0.893 J	9.40 J	7.74 -	0.638 -
A2P2-C18-10	0.912 J	0.743 J	0.757 -	0.743 J	10.9 J	7.36 -	0.563 -
A2P2-C18-12	1.06 J	0.923 J	0.911 -	0.923 J	12.3 J	7.27 -	0.650 -
A2P2-C18-13	1.32 J	1.06 J	1.08 -	1.06 J	12.3 J	9.00 -	0.696 -
A2P2-C18-14	1.36 J	1.14 J	1.13 -	1.14 J	18.5 J	11.1 -	0.727 -
A2P2-C18-15	1.26 J	1.13 J	1.18 -	1.13 J	11.4 J	9.70 -	0.754 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.45	1.22	1.2	1.22	24.3	9.7	0.761
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000048

5436

CERTIFICATION UNIT 19

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C19-2	1.16 J	0.740 -	0.757 -	0.740 -	3.77 -	4.44 -	0.321 -
A2P2-C19-2-D	0.972 J	0.671 -	0.686 -	0.671 -	3.74 -	4.71 -	0.351 -
A2P2-C19-3	0.815 J	0.606 -	0.606 -	0.606 -	2.48 -	4.46 -	0.288 -
A2P2-C19-4	1.04 J	0.998 -	1.03 -	0.998 -	16.0 -	7.40 -	0.555 -
A2P2-C19-5	1.09 J	0.791 -	0.789 -	0.791 -	4.53 -	4.64 -	0.394 -
A2P2-C19-6	0.705 J	0.737 -	0.745 -	0.737 -	16.9 -	2.99 U	0.289 -
A2P2-C19-7	0.770 J	0.672 -	0.650 -	0.672 -	18.9 -	3.43 -	0.360 -
A2P2-C19-10	0.986 J	0.892 -	0.903 -	0.892 -	15.4 -	6.92 -	0.541 -
A2P2-C19-11	0.916 J	0.802 -	0.881 -	0.802 -	17.0 -	5.09 -	0.431 -
A2P2-C19-12	1.13 J	0.901 -	0.930 -	0.901 -	11.9 -	7.32 -	0.508 -
A2P2-C19-14	1.05 J	0.823 -	0.844 -	0.823 -	11.9 -	4.79 -	0.432 -
A2P2-C19-15	0.721 J	0.792 -	0.773 -	0.792 -	16.4 -	4.16 -	0.411 -
A2P2-C19-16	0.839 J	0.844 -	0.855 -	0.844 -	12.1 -	3.22 -	0.348 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.16	0.998	1.03	0.998	18.9	7.4	0.555
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	1	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	8.3%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000049

5436

CERTIFICATION UNIT 20

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C20-1	0.809 J	0.605 -	0.611 -	0.605 -	6.51 -	4.29 -	0.391 -
A2P2-C20-2	1.02 J	0.736 -	0.736 -	0.736 -	7.79 -	5.09 -	0.420 -
A2P2-C20-3	0.867 J	0.632 -	0.657 -	0.632 -	4.63 -	4.65 -	0.374 -
A2P2-C20-5	0.967 J	0.819 -	0.808 -	0.819 -	12.9 -	5.04 -	0.520 -
A2P2-C20-6	0.770 J	0.758 -	0.764 -	0.758 -	15.7 -	3.61 -	0.463 -
A2P2-C20-8	0.858 J	0.751 -	0.743 -	0.751 -	10.2 -	4.40 -	0.492 -
A2P2-C20-10	1.06 J	0.648 -	0.687 -	0.648 -	8.64 -	4.33 -	0.419 -
A2P2-C20-11	1.02 J	0.696 -	0.700 -	0.696 -	5.41 -	4.40 -	0.395 -
A2P2-C20-11-D	0.853 J	0.710 -	0.714 -	0.710 -	6.08 -	4.81 -	0.384 -
A2P2-C20-12	0.959 J	0.674 -	0.676 -	0.674 -	8.31 -	5.31 -	0.447 -
A2P2-C20-13	0.949 J	0.731 -	0.746 -	0.731 -	5.65 -	4.71 -	0.433 -
A2P2-C20-14	0.807 J	0.601 -	0.589 -	0.601 -	7.35 -	4.68 -	0.340 -
A2P2-C20-15	1.01 J	0.651 -	0.635 -	0.651 -	6.42 -	4.66 -	0.422 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.06	0.819	0.808	0.819	15.7	5.31	0.52
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000050

5436

CERTIFICATION UNIT 21

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C21-1	0.861 -	0.768 -	0.777 -	0.768 -	16.1 J	4.36 -	0.475 -
A2P2-C21-2	0.950 -	0.828 -	0.845 -	0.828 -	17.2 J	7.66 -	0.635 -
A2P2-C21-4	1.00 -	0.904 -	0.906 -	0.904 -	15.7 J	5.48 -	0.557 -
A2P2-C21-5	1.21 -	0.898 -	0.917 -	0.898 -	12.5 J	7.49 -	0.647 -
A2P2-C21-6	1.18 -	0.967 -	0.975 -	0.967 -	13.4 J	6.63 -	0.622 -
A2P2-C21-8	1.29 -	0.960 -	0.961 -	0.960 -	8.20 J	6.31 -	0.538 -
A2P2-C21-9	0.953 -	0.833 -	0.847 -	0.833 -	9.96 J	5.57 -	0.504 -
A2P2-C21-11	0.879 -	0.633 -	0.623 -	0.633 -	6.46 J	5.20 -	0.425 -
A2P2-C21-12	1.06 -	0.861 -	0.866 -	0.861 -	10.6 J	5.13 -	0.430 -
A2P2-C21-13	0.890 -	0.762 -	0.761 -	0.762 -	9.27 J	4.87 -	0.396 -
A2P2-C21-14	1.06 -	0.757 -	0.789 -	0.757 -	5.47 J	5.13 -	0.385 -
A2P2-C21-16	1.11 -	0.757 -	0.790 -	0.757 -	3.23 J	5.04 -	0.427 -
A2P2-C21-16-D	1.05 -	0.698 -	0.716 -	0.698 -	4.73 J	5.46 -	0.451 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.29	0.967	0.975	0.967	17.2	7.66	0.647
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--

a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000051

5436

CERTIFICATION UNIT 22

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C22-2	1.26 J	1.02 J	1.07 J	1.02 J	13.2 J	8.21 -	0.678 -
A2P2-C22-3	1.71 J	1.37 J	1.36 J	1.37 J	10.8 J	13.2 -	1.45 -
A2P2-C22-4	1.28 J	1.09 J	1.09 J	1.09 J	13.4 J	6.98 -	0.751 -
A2P2-C22-5	1.88 J	1.35 J	1.36 J	1.35 J	10.7 J	12.9 -	1.09 -
A2P2-C22-7	1.36 J	1.13 J	1.15 J	1.13 J	13.1 J	3.23 -	0.450 -
A2P2-C22-8	1.35 J	1.12 J	1.12 J	1.12 J	14.8 J	4.31 -	0.597 -
A2P2-C22-9	0.936 J	0.827 J	0.838 J	0.827 J	11.2 J	5.69 -	0.556 -
A2P2-C22-9-D	1.36 J	1.09 J	1.09 J	1.09 J	14.9 J	6.92 -	0.633 -
A2P2-C22-10	0.884 J	0.719 J	0.760 J	0.719 J	17.5 J	6.66 -	0.555 -
A2P2-C22-12	0.809 J	0.769 J	0.788 J	0.769 J	15.7 J	4.62 -	0.448 -
A2P2-C22-13	1.21 J	1.14 J	1.13 J	1.14 J	19.4 J	4.85 -	0.573 -
A2P2-C22-15	1.26 J	0.847 J	0.876 J	0.847 J	66.2 J	3.59 -	0.432 -
A2P2-C22-16	0.794 J	0.623 J	0.649 J	0.623 J	7.24 J	5.95 -	0.487 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.88	1.37	1.36	1.37	66.2	13.2	1.45
Max. >= Limit	Yes	No	No	No	No	Yes	No
W-statistic Prob. *	30.9% (N)	--	--	--	--	52.4% (LN)	--
Test Procedure	Normal	--	--	--	--	Lognormal	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	1.26	--	--	--	--	6.82	--
UCL	1.43	--	--	--	--	8.39	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	pass	--	--	--	--	pass	--
a posteriori Sample	5	--	--	--	--	3	--
Size calculation	Pass	--	--	--	--	Pass	--

000052

5436

CERTIFICATION UNIT 23

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C23-1	1.23 J	1.13 -	1.19 -	1.13 -	18.4 J	8.97 -	0.637 -
A2P2-C23-3	1.28 J	1.19 -	1.20 -	1.19 -	17.1 J	7.84 -	0.514 -
A2P2-C23-4	1.34 J	1.19 -	1.19 -	1.19 -	22.0 J	7.56 -	0.465 -
A2P2-C23-5	1.14 J	0.997 -	0.990 -	0.997 -	17.9 J	5.27 -	0.499 -
A2P2-C23-5-D	0.970 J	1.03 -	1.02 -	1.03 -	17.1 J	5.04 -	0.513 -
A2P2-C23-7	1.07 J	0.969 -	1.07 -	0.969 -	18.6 J	5.90 -	0.529 -
A2P2-C23-8	1.29 J	1.19 -	1.21 -	1.19 -	16.8 J	7.44 -	0.612 -
A2P2-C23-10	0.922 J	0.927 -	0.944 -	0.927 -	22.2 J	6.12 -	0.511 -
A2P2-C23-11	1.36 J	1.26 -	1.31 -	1.26 -	17.5 J	10.4 -	0.807 -
A2P2-C23-12	1.21 J	1.32 -	1.37 -	1.32 -	13.2 J	6.81 -	0.508 -
A2P2-C23-13	1.21 J	1.05 -	1.05 -	1.05 -	16.5 J	5.38 -	0.564 -
A2P2-C23-14	1.13 J	1.07 -	1.11 -	1.07 -	14.5 J	5.33 -	0.522 -
A2P2-C23-15	1.07 J	1.09 -	1.10 -	1.09 -	16.0 J	5.75 -	0.531 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.36	1.32	1.37	1.32	22.2	10.4	0.807
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000053

5436

CERTIFICATION UNIT 24

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C24-1	1.10 J	1.11 -	1.12 -	1.11 -	17.7 -	6.30 -	0.558 -
A2P2-C24-2	1.16 J	1.23 -	1.29 -	1.23 -	13.3 -	8.07 -	0.742 -
A2P2-C24-4	1.06 J	1.11 -	1.13 -	1.11 -	15.5 -	6.02 -	0.587 -
A2P2-C24-5	1.10 J	1.03 -	1.07 -	1.03 -	18.1 -	7.24 -	0.657 -
A2P2-C24-7	1.37 J	1.20 -	1.23 -	1.20 -	19.8 -	11.5 -	0.544 -
A2P2-C24-8	0.997 J	0.801 -	0.801 -	0.801 -	13.7 -	7.97 -	0.479 -
A2P2-C24-8-D	0.762 J	0.697 -	0.689 -	0.697 -	12.0 -	9.23 -	0.559 -
A2P2-C24-10	0.956 J	0.887 -	0.890 -	0.887 -	29.5 -	3.78 -	0.347 -
A2P2-C24-11	1.21 J	1.03 -	1.06 -	1.03 -	14.7 -	3.98 -	0.486 -
A2P2-C24-12	0.738 J	0.526 -	0.533 -	0.526 -	0.000 U	4.69 -	0.265 -
A2P2-C24-13	1.19 J	0.811 -	0.804 -	0.811 -	27.2 -	8.21 -	0.656 -
A2P2-C24-14	1.12 J	0.905 -	0.924 -	0.905 -	16.7 -	5.62 -	0.510 -
A2P2-C24-16	0.716 J	0.658 -	0.646 -	0.658 -	4.35 J	5.21 -	0.351 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.37	1.23	1.29	1.23	29.5	11.5	0.742
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	1	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	8.3%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000054

5436

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-RHS-C-1	0.764 -	0.781 J	0.761 J	0.781 J	3.86 -	7.29 -	0.372 -
A2P2-RHS-C-1-D	0.849 -	0.590 J	0.566 J	0.590 J	5.79 -	8.89 -	0.349 -
A2P2-RHS-C-2	0.561 -	0.412 -	0.429 -	0.412 -	2.49 -	3.83 -	0.409 -
A2P2-RHS-C-3	0.554 -	0.359 -	0.368 -	0.359 -	4.50 -	5.61 -	0.424 -
A2P2-RHS-C-4	1.07 -	0.673 -	0.686 -	0.673 -	7.27 -	6.40 -	0.461 -
A2P2-RHS-C-5	0.909 -	0.969 -	1.01 -	0.969 -	16.6 -	4.28 -	0.435 -
A2P2-RHS-C-6	0.716 -	0.524 -	0.520 -	0.524 -	8.85 -	4.12 -	0.235 -
A2P2-RHS-C-7	0.746 -	0.710 -	0.690 -	0.710 -	5.52 -	4.50 -	0.591 -
A2P2-C25-8	1.17 -	0.766 -	0.719 -	0.766 -	37.5 -	4.82 J	0.556 -
A2P2-C25-9	1.62 -	1.21 -	1.19 -	1.21 -	19.1 -	4.29 J	0.549 -
A2P2-C25-10	1.13 -	1.14 -	1.17 -	1.14 -	7.09 -	5.07 J	0.601 -
A2P2-C25-11	2.05 -	1.08 -	1.09 -	1.08 -	19.7 -	4.51 J	0.481 -
A2P2-C25-12	0.918 -	0.661 -	0.673 -	0.661 -	5.08 -	4.85 J	0.497 -
A2P2-C25-13	0.967 -	0.804 -	0.817 -	0.804 -	38.3 -	7.29 J	0.642 -
A2P2-C25-14	0.843 -	0.636 -	0.666 -	0.636 -	2.79 -	5.77 J	0.508 -
A2P2-C25-16	0.908 -	0.755 -	0.756 -	0.755 -	14.1 -	5.72 J	0.614 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	2.05	1.21	1.19	1.21	38.3	8.89	0.642
Max. >= Limit	Yes	No	No	No	No	No	No
W-statistic Prob. *	47.0% (LN)	--	--	--	--	--	--
Test Procedure	Lognormal	--	--	--	--	--	--
Sample Size	15	15	15	15	15	15	15
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	1.00	--	--	--	--	--	--
UCL	1.20	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	pass	--	--	--	--	--	--
a posteriori Sample	4	--	--	--	--	--	--
Size calculation	Pass	--	--	--	--	--	--

000055

5436

CERTIFICATION UNIT 26

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C26-2	0.804 J	0.679 -	0.680 -	0.679 -	3.36 -	5.54 -	0.359 -
A2P2-C26-3	0.963 J	0.898 -	0.894 -	0.898 -	7.05 -	7.99 -	0.636 -
A2P2-C26-4	1.35 J	1.18 -	1.22 -	1.18 -	9.63 -	6.93 -	0.714 -
A2P2-C26-5	1.17 J	0.877 -	0.858 -	0.877 -	4.79 -	6.65 -	0.682 -
A2P2-C26-6	1.40 J	1.10 -	1.10 -	1.10 -	5.97 -	8.08 -	0.712 -
A2P2-C26-7	0.913 J	0.830 -	0.828 -	0.830 -	0.931 -	7.82 -	0.626 -
A2P2-C26-9	1.46 J	0.981 -	0.976 -	0.981 -	3.64 -	16.5 -	0.683 -
A2P2-C26-10	1.23 J	1.02 -	1.03 -	1.02 -	8.05 -	8.77 -	0.629 -
A2P2-C26-11	0.840 J	0.801 -	0.808 -	0.801 -	4.95 -	5.82 -	0.502 -
A2P2-C26-13	1.25 J	1.16 -	1.14 -	1.16 -	5.97 -	7.71 -	0.820 -
A2P2-C26-14	1.12 J	0.931 -	0.923 -	0.931 -	3.39 -	9.06 -	0.635 -
A2P2-C26-15	1.09 J	1.05 -	1.04 -	1.05 -	5.60 -	5.13 -	0.758 -
A2P2-C26-15-D	1.04 J	1.07 -	1.06 -	1.07 -	4.95 -	5.85 -	0.752 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.46	1.18	1.22	1.18	9.63	16.5	0.82
Max. >= Limit	No	No	No	No	No	Yes	No
W-statistic Prob. *	--	--	--	--	--	9.5% (LN)	--
Test Procedure	--	--	--	--	--	Lognormal	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	7.99	--
UCL	--	--	--	--	--	9.11	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	pass	--

a posteriori Sample	--	--	--	--	--	3	--
Size calculation	--	--	--	--	--	Pass	--

000056

5436

CERTIFICATION UNIT 27

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C27-1	1.09 J	0.974 -	1.04 -	0.974 -	5.45 -	6.22 -	0.711 -
A2P2-C27-2	1.07 J	1.11 -	1.12 -	1.11 -	5.55 -	8.01 -	0.734 -
A2P2-C27-3	0.954 J	1.08 -	1.02 -	1.08 -	6.87 -	8.19 -	0.771 -
A2P2-C27-5	1.09 J	1.21 -	1.22 -	1.21 -	7.16 -	9.36 -	0.791 -
A2P2-C27-7	0.992 J	0.931 -	0.938 -	0.931 -	8.13 -	4.55 -	0.659 -
A2P2-C27-8	1.05 J	0.912 -	0.915 -	0.912 -	6.10 -	6.95 -	0.655 -
A2P2-C27-10	1.10 J	1.00 -	1.01 -	1.00 -	8.03 -	10.7 -	0.827 -
A2P2-C27-11	1.06 J	0.916 -	0.977 -	0.916 -	7.81 -	7.90 -	0.620 -
A2P2-C27-12	0.968 J	0.903 -	0.912 -	0.903 -	4.72 -	7.96 -	0.648 -
A2P2-C27-14	0.956 J	0.931 -	0.917 -	0.931 -	5.86 -	7.97 -	0.680 -
A2P2-C27-14-D	1.05 J	0.944 -	0.967 -	0.944 -	7.37 -	7.76 -	0.686 -
A2P2-C27-15	0.939 J	0.838 -	0.828 -	0.838 -	3.58 -	7.57 -	0.687 -
A2P2-C27-16	1.10 J	1.14 -	1.15 -	1.14 -	5.16 -	8.55 -	0.764 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.1	1.21	1.22	1.21	8.13	10.7	0.827
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000057

5436

CERTIFICATION UNIT 28

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C28-1	1.32 J	1.05 J	1.06 J	1.05 J	5.99 -	8.44 -	0.744 -
A2P2-C28-2	1.20 J	1.01 J	1.02 J	1.01 J	4.13 -	9.18 -	0.894 -
A2P2-C28-3	1.36 J	1.27 J	1.32 J	1.27 J	7.32 -	12.3 -	1.04 -
A2P2-C28-3-D	1.07 J	1.07 J	1.06 J	1.07 J	7.22 -	9.33 -	0.943 -
A2P2-C28-5	1.01 J	1.04 J	1.04 J	1.04 J	8.64 -	9.71 -	0.788 -
A2P2-C28-7	1.24 J	0.946 J	0.938 J	0.946 J	5.20 -	8.61 -	0.762 -
A2P2-C28-8	1.17 J	0.998 J	0.994 J	0.998 J	5.49 -	6.42 -	0.542 -
A2P2-C28-9	0.985 J	0.862 J	0.868 J	0.862 J	4.94 -	9.16 -	0.768 -
A2P2-C28-11	0.645 J	0.560 J	0.570 J	0.560 J	1.91 -	4.48 -	0.431 -
A2P2-C28-12	1.24 J	1.19 J	1.19 J	1.19 J	6.45 -	10.8 -	0.616 -
A2P2-C28-14	0.842 J	0.980 J	0.979 J	0.980 J	4.81 -	8.53 -	0.745 -
A2P2-C28-15	1.54 J	1.23 J	1.23 J	1.23 J	13.3 -	11.7 -	0.914 -
A2P2-C28-16	1.95 J	1.40 J	1.42 J	1.40 J	7.71 -	11.3 -	1.48 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.95	1.4	1.42	1.4	13.3	12.3	1.48
Max. >= Limit	Yes	No	No	No	No	Yes	No
W-statistic Prob. *	83.9% (LN)	--	--	--	--	51.2% (N)	--
Test Procedure	Lognormal	--	--	--	--	Normal	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	1.21	--	--	--	--	9.22	--
UCL	1.43	--	--	--	--	10.09	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	pass	--	--	--	--	pass	--
a posteriori Sample	5	--	--	--	--	4	--
Size calculation	Pass	--	--	--	--	Pass	--

000058

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CERTIFICATION UNIT 29

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C29-1	0.855 J	0.969 -	0.977 -	0.969 -	18.0 -	7.37 -	0.554 -
A2P2-C29-3	0.836 J	0.864 -	0.854 -	0.864 -	16.9 -	6.19 -	0.534 -
A2P2-C29-4	0.927 J	1.06 -	1.01 -	1.06 -	15.9 -	6.32 -	0.589 -
A2P2-C29-5	0.779 J	1.17 -	1.16 -	1.17 -	14.7 -	9.91 -	0.831 -
A2P2-C29-6	0.981 J	1.02 -	1.02 -	1.02 -	21.0 -	7.02 -	0.483 -
A2P2-C29-7	0.886 J	1.03 -	1.04 -	1.03 -	18.8 -	6.70 -	0.526 -
A2P2-C29-10	0.810 J	0.893 -	0.904 -	0.893 -	15.8 -	9.11 -	0.694 -
A2P2-C29-10-D	0.749 J	0.944 -	0.964 -	0.944 -	18.1 -	8.05 -	0.663 -
A2P2-C29-11	1.02 J	1.02 -	1.03 -	1.02 -	28.6 -	7.93 -	0.579 -
A2P2-C29-12	0.805 J	1.07 -	1.07 -	1.07 -	7.77 -	7.85 -	0.493 -
A2P2-C29-13	0.878 J	0.983 -	1.00 -	0.983 -	22.0 -	7.95 -	0.678 -
A2P2-C29-14	0.965 J	0.966 -	0.968 -	0.966 -	13.8 -	8.28 -	0.770 -
A2P2-C29-16	0.891 J	1.06 -	1.08 -	1.06 -	16.1 -	8.48 -	0.839 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.02	1.17	1.16	1.17	28.6	9.91	0.839
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000059

5436

CERTIFICATION UNIT 30

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C30-1	1.02 J	1.09 -	1.10 -	1.09 -	16.3 -	9.30 -	0.586 -
A2P2-C30-3	1.07 J	1.05 -	1.06 -	1.05 -	20.7 -	6.60 -	0.630 -
A2P2-C30-4	0.977 J	1.07 -	1.07 -	1.07 -	20.2 -	9.93 -	0.608 -
A2P2-C30-5	1.26 J	1.06 -	1.07 -	1.06 -	19.3 -	7.80 -	0.650 -
A2P2-C30-5-D	1.04 J	1.03 -	1.05 -	1.03 -	19.9 -	7.96 -	0.682 -
A2P2-C30-7	1.15 J	1.12 -	1.13 -	1.12 -	15.7 -	7.98 -	0.665 -
A2P2-C30-8	1.12 J	1.14 -	1.17 -	1.14 -	15.9 -	8.52 -	0.615 -
A2P2-C30-10	1.14 J	1.07 -	1.10 -	1.07 -	19.4 -	8.23 -	0.616 -
A2P2-C30-11	1.08 J	1.06 -	1.05 -	1.06 -	18.9 -	8.60 -	0.584 -
A2P2-C30-12	1.04 J	0.921 -	0.941 -	0.921 -	23.0 -	6.48 -	0.517 -
A2P2-C30-14	1.16 J	1.06 -	1.06 -	1.06 -	22.5 -	9.93 -	0.686 -
A2P2-C30-15	1.06 J	1.08 -	1.09 -	1.08 -	14.7 -	6.28 -	0.528 -
A2P2-C30-16	0.861 J	0.699 -	0.722 -	0.699 -	7.71 -	7.39 -	0.582 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.26	1.14	1.17	1.14	23	9.93	0.686
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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CERTIFICATION UNIT 31

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C31-1	1.21 -	1.11 -	1.12 -	1.11 -	24.9 J	8.93 -	0.548 -
A2P2-C31-3	1.11 -	1.05 -	1.06 -	1.05 -	19.4 J	9.04 -	0.471 -
A2P2-C31-4	1.23 -	1.13 -	1.12 -	1.13 -	14.7 J	8.79 -	0.625 -
A2P2-C31-5	1.28 -	1.09 -	1.11 -	1.09 -	18.5 J	8.14 -	0.596 -
A2P2-C31-7	1.25 -	1.13 -	1.14 -	1.13 -	26.4 J	5.91 -	0.525 -
A2P2-C31-8	1.18 -	0.997 -	1.03 -	0.997 -	11.5 J	6.07 -	0.578 -
A2P2-C31-9	0.956 -	1.01 -	1.04 -	1.01 -	20.3 J	7.69 -	0.695 -
A2P2-C31-9-D	0.913 -	0.969 -	0.952 -	0.969 -	16.3 J	6.98 -	0.614 -
A2P2-C31-10	1.14 -	1.08 -	1.07 -	1.08 -	9.47 J	6.22 -	0.661 -
A2P2-C31-11	1.12 -	1.06 -	1.11 -	1.06 -	13.2 J	10.5 -	0.735 -
A2P2-C31-14	1.28 -	1.16 -	1.19 -	1.16 -	17.8 J	6.73 -	0.490 -
A2P2-C31-15	1.09 -	1.03 -	1.03 -	1.03 -	8.06 J	6.16 -	0.566 -
A2P2-C31-16	1.22 -	1.11 -	1.10 -	1.11 -	15.0 J	12.9 -	1.35 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.28	1.16	1.19	1.16	26.4	12.9	1.35
Max. >= Limit	No	No	No	No	No	Yes	No
W-statistic Prob. *	--	--	--	--	--	35.8% (LN)	--
Test Procedure	--	--	--	--	--	Lognormal	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	8.10	--
UCL	--	--	--	--	--	8.99	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	pass	--
a posteriori Sample	--	--	--	--	--	3	--
Size calculation	--	--	--	--	--	Pass	--

000061

5436

CERTIFICATION UNIT 32

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C32-3	1.01 -	0.818 J	0.836 J	0.818 J	4.61 J	7.33 J	0.633 -
A2P2-C32-5	1.41 -	1.32 J	1.33 J	1.32 J	10.9 J	5.17 J	0.836 -
A2P2-C32-6	1.08 -	1.03 J	1.03 J	1.03 J	8.76 J	5.81 J	0.573 -
A2P2-C32-7	1.13 -	1.18 J	1.15 J	1.18 J	6.12 J	10.8 J	0.841 -
A2P2-C32-9	1.04 -	0.878 J	0.892 J	0.878 J	6.22 J	6.81 J	0.609 -
A2P2-C32-9-D	1.19 -	1.06 J	1.07 J	1.06 J	11.2 J	10.2 J	0.766 -
A2P2-N2-1	1.12 -	0.873 -	0.857 -	0.873 -	4.94 -	11.1 J	0.840 -
A2P2-N2-2	1.77 -	1.30 -	1.30 -	1.30 -	4.49 -	11.5 J	0.800 -
A2P2-N2-3	1.56 -	1.26 -	1.30 -	1.26 -	5.69 -	8.90 J	0.850 -
A2P2-N2-3-D	1.73 -	1.26 -	1.21 -	1.26 -	5.92 -	12.6 J	0.920 -
A2P2-N2-4	1.61 -	1.21 -	1.21 -	1.21 -	7.37 -	9.90 J	0.740 -
A2P2-N2-5	1.64 -	1.20 -	1.21 -	1.20 -	5.67 -	8.80 J	0.720 -
A2P2-N2-6	1.44 -	1.14 -	1.14 -	1.14 -	6.71 -	10.1 J	1.00 -
A2P2-N2-7	1.83 -	1.28 -	1.27 -	1.28 -	7.89 -	10.6 J	1.00 -
A2P2-N2-8	1.71 -	1.34 -	1.35 -	1.34 -	5.68 -	14.1 J	0.930 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	mg/kg	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.83	1.34	1.35	1.34	11.2 J	14.1	1.0
Max. >= Limit	Yes	No	No	No	No	Yes	No
W-statistic Prob. #	14.0% (N)	--	--	--	--	57.3% (N)	--
Test Procedure	Normal	--	--	--	--	Normal	--
Sample Size	13	13	13	13	13	13	13
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean*	1.44	--	--	--	--	9.85	--
UCL	1.58	--	--	--	--	10.80	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	pass	--	--	--	--	pass	--

a posteriori Sample	10	--	--	--	--	8	--
Size calculation	Pass	--	--	--	--	Pass	--

0000062

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CERTIFICATION UNIT 33

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C33-1	0.874 -	0.765 -	0.760 -	0.765 -	12.2 -	6.54 -	0.518 -
A2P2-C33-3	1.11 -	0.880 -	0.885 -	0.880 -	17.5 -	6.48 -	0.592 -
A2P2-C33-4	1.01 -	1.01 -	1.02 -	1.01 -	11.8 -	7.16 -	0.603 -
A2P2-C33-6	1.10 -	1.08 -	1.15 -	1.08 -	15.4 -	7.56 -	0.720 -
A2P2-C33-7	1.07 -	1.01 -	0.993 -	1.01 -	12.6 -	6.08 -	0.537 -
A2P2-C33-8	1.07 -	1.02 -	1.02 -	1.02 -	20.0 -	7.61 -	0.586 -
A2P2-C33-9	1.07 -	1.02 -	0.965 -	1.02 -	16.7 -	10.4 -	0.923 -
A2P2-C33-10	1.09 -	1.05 -	1.04 -	1.05 -	14.7 -	7.33 -	0.757 -
A2P2-C33-11	1.21 -	1.09 -	1.11 -	1.09 -	13.1 -	9.33 -	0.751 -
A2P2-C33-13	1.28 -	1.11 -	1.11 -	1.11 -	6.84 -	10.6 -	0.766 -
A2P2-C33-14	1.09 -	1.06 -	1.06 -	1.06 -	16.3 -	7.94 -	0.614 -
A2P2-C33-15	1.25 -	1.29 -	1.32 -	1.29 -	8.23 -	10.3 -	0.952 -
A2P2-C33-15-D	1.37 -	1.24 -	1.27 -	1.24 -	8.12 -	11.0 -	1.03 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.37	1.29	1.32	1.29	20	11	1.03
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000063

CERTIFICATION UNIT 34

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C34-1	1.22 J	1.04 -	1.02 -	1.04 -	16.9 -	8.92 -	0.514 -
A2P2-C34-3	0.700 J	0.649 -	0.650 -	0.649 -	13.4 -	7.25 -	0.631 -
A2P2-C34-4	1.20 J	1.09 -	1.09 -	1.09 -	16.1 -	9.05 -	0.520 -
A2P2-C34-5	1.03 J	1.03 -	1.04 -	1.03 -	11.6 -	7.88 -	0.508 -
A2P2-C34-7	1.17 J	0.966 -	0.957 -	0.966 -	16.6 -	7.47 -	0.581 -
A2P2-C34-8	1.05 J	1.07 -	1.06 -	1.07 -	19.0 -	6.72 -	0.548 -
A2P2-C34-9	1.05 J	1.08 -	1.14 -	1.08 -	19.1 -	5.72 -	0.515 -
A2P2-C34-10	1.03 J	0.946 -	0.927 -	0.946 -	15.9 -	9.14 -	0.620 -
A2P2-C34-12	1.04 J	0.990 -	0.984 -	0.990 -	20.5 -	7.23 -	0.483 -
A2P2-C34-13	1.08 J	0.861 -	0.867 -	0.861 -	9.73 -	10.4 -	0.744 -
A2P2-C34-14	1.08 J	1.07 -	1.08 -	1.07 -	14.1 -	9.89 J	0.717 -
A2P2-C34-16	0.884 J	0.909 -	0.902 -	0.909 -	14.0 -	7.27 -	0.448 -
A2P2-C34-16-D	0.945 J	0.974 -	0.992 -	0.974 -	15.3 -	6.05 -	0.368 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.22	1.09	1.14	1.09	20.5	10.4	0.744
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--

a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000064

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CERTIFICATION UNIT 35

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C35-1	0.942 -	0.984 J	0.995 -	0.984 J	15.7 -	6.18 -	0.520 -
A2P2-C35-2	0.889 -	0.973 J	0.997 -	0.973 J	13.4 -	5.72 -	0.695 -
A2P2-C35-4	1.02 -	1.01 J	0.999 -	1.01 J	20.8 -	7.03 -	0.566 -
A2P2-C35-5	1.06 -	1.03 J	1.04 -	1.03 J	21.8 -	5.86 -	0.484 -
A2P2-C35-5-D	1.06 -	0.998 J	1.01 -	0.998 J	20.3 -	6.80 -	0.491 -
A2P2-C35-6	1.10 -	1.06 J	1.08 -	1.06 J	13.1 -	6.54 -	0.601 -
A2P2-C35-7	1.31 -	1.14 J	1.16 -	1.14 J	14.9 -	7.55 -	0.568 -
A2P2-C35-9	1.05 -	0.985 J	0.968 -	0.985 J	7.10 -	5.71 -	0.495 -
A2P2-C35-11	0.920 -	0.944 J	0.960 -	0.944 J	6.98 -	6.96 -	0.647 -
A2P2-C35-12	0.809 -	0.708 J	0.702 -	0.708 J	15.3 -	9.52 -	0.579 -
A2P2-C35-13	1.08 -	0.985 J	0.983 -	0.985 J	27.9 -	5.82 -	0.437 -
A2P2-C35-14	1.04 -	0.937 J	0.951 -	0.937 J	8.59 -	6.30 -	0.533 -
A2P2-C35-16	1.19 -	1.08 J	1.18 -	1.08 J	14.5 -	5.25 -	0.607 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.31	1.14	1.18	1.14	27.9	9.52	0.695
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--

a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000065

5436

CERTIFICATION UNIT 36

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C36-1	1.20 -	1.02 -	1.02 -	1.02 -	15.8 J	8.44 -	0.609 -
A2P2-C36-2	0.914 -	1.06 -	1.01 -	1.06 -	13.6 J	6.06 -	0.601 -
A2P2-C36-3	0.805 -	0.858 -	0.866 -	0.858 -	21.1 J	6.24 -	0.457 -
A2P2-C36-6	1.07 -	0.995 -	0.985 -	0.995 -	21.0 J	7.10 -	0.476 -
A2P2-C36-7	1.13 -	1.04 -	1.06 -	1.04 -	22.3 J	8.22 -	0.519 -
A2P2-C36-8	0.955 -	1.00 -	1.00 -	1.00 -	17.5 J	8.19 -	0.561 -
A2P2-C36-9	0.766 -	0.941 -	0.931 -	0.941 -	24.1 J	7.14 -	0.505 -
A2P2-C36-11	1.11 -	1.00 -	0.989 -	1.00 -	23.2 J	6.84 -	0.539 -
A2P2-C36-12	0.989 -	1.07 -	1.07 -	1.07 -	6.94 J	8.45 -	0.597 -
A2P2-C36-13	1.12 -	0.975 -	0.966 -	0.975 -	18.4 J	7.84 -	0.615 -
A2P2-C36-15	1.28 -	1.04 -	1.04 -	1.04 -	12.8 J	8.10 -	0.622 -
A2P2-C36-15-D	1.24 -	1.01 -	1.03 -	1.01 -	19.1 J	6.85 -	0.626 -
A2P2-C36-16	0.977 -	1.06 -	1.06 -	1.06 -	21.3 J	7.09 -	0.526 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.28	1.07	1.07	1.07	24.1	8.45	0.626
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

000066

5436

CERTIFICATION UNIT 37

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C37-1	0.985 J	1.14 J	1.15 J	1.14 J	17.8 -	7.06 -	0.635 -
A2P2-C37-2	0.991 J	0.989 J	0.989 J	0.989 J	20.9 -	7.77 -	0.740 -
A2P2-C37-3	1.10 J	1.15 J	1.17 J	1.15 J	21.6 -	9.57 -	1.14 -
A2P2-C37-6	0.827 J	0.931 J	0.928 J	0.931 J	25.5 -	6.53 -	0.678 -
A2P2-C37-7	1.01 J	1.05 J	1.06 J	1.05 J	24.2 -	9.53 -	0.680 -
A2P2-C37-8	1.00 J	1.11 J	1.11 J	1.11 J	17.7 -	9.73 -	0.665 -
A2P2-C37-9	0.966 J	0.977 J	0.982 J	0.977 J	18.4 -	8.59 -	0.622 -
A2P2-C37-10	0.997 J	1.09 J	1.10 J	1.09 J	21.8 -	6.87 -	0.516 -
A2P2-C37-11	1.05 J	1.03 J	1.04 J	1.03 J	20.9 -	6.84 -	0.617 -
A2P2-C37-11-D	0.886 J	1.07 J	1.06 J	1.07 J	21.4 -	6.59 -	0.573 -
A2P2-C37-14	1.08 J	1.04 J	1.06 J	1.04 J	16.6 -	8.37 -	0.581 -
A2P2-C37-15	0.998 J	1.17 J	1.16 J	1.17 J	25.5 -	6.26 -	0.517 -
A2P2-C37-16	1.14 J	1.06 J	1.06 J	1.06 J	16.3 -	7.18 -	0.507 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.14	1.17	1.17	1.17	25.5	9.73	1.14
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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5436

CERTIFICATION UNIT 38

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C38-1	0.939 -	1.05 -	1.05 -	1.05 -	18.8 J	8.16 -	0.819 -
A2P2-C38-1-D	0.892 -	1.15 -	1.17 -	1.15 -	23.9 J	6.72 -	0.751 -
A2P2-C38-3	1.07 -	1.10 -	1.09 -	1.10 -	22.5 J	5.77 -	0.748 -
A2P2-C38-4	0.910 -	1.15 -	1.15 -	1.15 -	22.2 J	6.32 -	0.552 -
A2P2-C38-5	0.987 -	1.06 -	1.06 -	1.06 -	27.3 J	5.48 -	0.472 -
A2P2-C38-7	1.15 -	0.956 -	0.989 -	0.956 -	22.4 J	5.61 -	0.449 -
A2P2-C38-8	1.09 -	1.06 -	1.09 -	1.06 -	20.4 J	7.24 -	0.423 -
A2P2-C38-9	1.23 -	1.09 -	1.10 -	1.09 -	25.5 J	7.29 -	0.694 -
A2P2-C38-10	1.06 -	1.05 -	1.06 -	1.05 -	22.3 J	5.46 -	0.442 -
A2P2-C38-11	1.16 -	1.13 -	1.14 -	1.13 -	19.5 J	7.21 -	0.571 -
A2P2-C38-13	1.13 -	1.07 -	1.09 -	1.07 -	23.0 J	5.25 -	0.504 -
A2P2-C38-14	1.06 -	1.02 -	1.03 -	1.02 -	26.5 J	6.14 -	0.479 -
A2P2-C38-15	1.02 -	1.10 -	1.10 -	1.10 -	21.6 J	6.11 -	0.492 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.23	1.15	1.17	1.15	27.3	8.16	0.819
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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5436

CERTIFICATION UNIT 39

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C39-1	1.15 -	1.09 -	1.09 -	1.09 -	26.8 J	5.64 -	0.465 -
A2P2-C39-2	1.14 -	0.998 -	1.01 -	0.998 -	23.2 J	5.74 -	0.446 -
A2P2-C39-4	1.29 -	1.10 -	1.10 -	1.10 -	20.4 J	5.94 -	0.451 -
A2P2-C39-6	1.22 -	1.16 -	1.16 -	1.16 -	20.5 J	6.98 -	0.676 -
A2P2-C39-7	1.18 -	1.13 -	1.13 -	1.13 -	18.9 J	4.77 -	0.571 -
A2P2-C39-8	1.38 -	1.17 -	1.17 -	1.17 -	21.7 J	4.94 -	0.601 -
A2P2-C39-9	1.17 -	1.12 -	1.12 -	1.12 -	23.0 J	6.16 -	0.408 -
A2P2-C39-10	1.16 -	1.02 -	1.02 -	1.02 -	23.2 J	6.19 -	0.413 -
A2P2-C39-12	1.16 -	1.04 -	1.06 -	1.04 -	20.9 J	5.02 -	0.416 -
A2P2-C39-12-D	1.11 -	0.934 -	0.922 -	0.934 -	16.2 J	4.89 -	0.430 -
A2P2-C39-13	1.07 -	1.05 -	1.03 -	1.05 -	17.4 J	7.61 -	0.445 -
A2P2-C39-14	1.18 -	1.13 -	1.13 -	1.13 -	18.4 J	8.21 -	0.504 -
A2P2-C39-15	1.24 -	1.19 -	1.20 -	1.19 -	23.6 J	6.42 -	0.521 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.38	1.19	1.2	1.19	26.8	8.21	0.676
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--

a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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CERTIFICATION UNIT 40

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C40-1	1.10 -	0.992 -	1.03 -	0.992 -	24.8 J	5.09 -	0.446 -
A2P2-C40-1-D	0.991 -	1.06 -	1.06 -	1.06 -	32.6 J	5.40 -	0.469 -
A2P2-C40-2	1.09 -	0.955 -	0.950 -	0.955 -	26.3 J	7.40 -	0.542 -
A2P2-C40-3	0.973 -	1.07 -	1.07 -	1.07 -	24.9 J	7.04 -	0.498 -
A2P2-C40-5	1.15 -	1.01 -	1.01 -	1.01 -	21.3 J	9.73 -	0.737 -
A2P2-C40-6	1.07 -	1.17 -	1.17 -	1.17 -	24.7 J	8.28 -	0.625 -
A2P2-C40-8	1.13 -	0.998 -	0.980 -	0.998 -	21.2 J	7.81 -	0.832 -
A2P2-C40-9	1.16 -	0.996 -	0.994 -	0.996 -	26.6 J	6.18 -	0.502 -
A2P2-C40-10	1.22 -	1.10 -	1.08 -	1.10 -	34.7 J	5.90 -	0.494 -
A2P2-C40-11	1.07 -	0.946 -	0.937 -	0.946 -	22.0 J	7.33 -	0.664 -
A2P2-C40-13	1.15 -	1.04 -	1.03 -	1.04 -	27.2 J	6.28 -	0.400 -
A2P2-C40-14	1.09 -	0.979 -	0.963 -	0.979 -	18.3 J	6.78 -	0.675 -
A2P2-C40-15	1.11 -	0.962 -	0.951 -	0.962 -	23.3 J	6.55 -	0.468 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.22	1.17	1.17	1.17	34.7	9.73	0.832
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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CERTIFICATION UNIT 41

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C41-1	1.11 J	1.02 -	1.02 -	1.02 -	37.3 -	7.00 -	0.769 -
A2P2-C41-2	0.894 J	1.07 -	1.06 -	1.07 -	37.9 -	6.03 -	0.531 -
A2P2-C41-3	0.975 J	0.958 -	0.956 -	0.958 -	8.02 -	8.28 -	0.649 -
A2P2-C41-5	1.03 J	1.08 -	1.17 -	1.08 -	27.9 -	6.10 -	0.556 -
A2P2-C41-6	1.11 J	1.15 -	1.15 -	1.15 -	26.3 -	6.20 -	0.412 -
A2P2-C41-6-D	1.00 J	1.18 -	1.17 -	1.18 -	29.5 -	8.05 -	0.463 -
A2P2-C41-8	1.29 J	1.12 -	1.14 -	1.12 -	23.5 -	7.81 -	0.482 -
A2P2-C41-10	1.04 J	0.967 -	0.972 -	0.967 -	13.0 -	6.63 -	0.602 -
A2P2-C41-11	0.842 J	0.842 -	0.822 -	0.842 -	26.4 -	5.32 -	0.426 -
A2P2-C41-12	1.26 J	1.18 -	1.18 -	1.18 -	22.9 -	8.65 -	0.665 -
A2P2-C41-13	1.04 J	0.994 -	0.998 -	0.994 -	33.8 -	6.73 -	0.528 -
A2P2-C41-15	1.13 J	1.04 -	1.04 -	1.04 -	26.8 -	7.55 -	0.722 -
A2P2-C41-16	1.09 J	1.05 -	1.06 -	1.05 -	32.9 -	7.27 -	0.608 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.29	1.18	1.18	1.18	37.9	8.65	0.769
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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5436

CERTIFICATION UNIT 42

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C42-1	1.18 -	0.997 -	0.999 -	0.997 -	24.4 -	6.77 -	0.432 -
A2P2-C42-2	1.11 -	1.02 -	1.07 -	1.02 -	26.6 -	6.00 -	0.475 -
A2P2-C42-3	1.21 -	1.06 -	1.07 -	1.06 -	30.3 -	7.18 -	0.490 -
A2P2-C42-5	1.15 -	1.04 -	1.04 -	1.04 -	28.4 -	5.38 -	0.387 -
A2P2-C42-7	1.19 -	1.06 -	1.08 -	1.06 -	10.2 -	8.21 -	0.753 -
A2P2-C42-7-D	1.22 -	1.03 -	1.11 -	1.03 -	10.9 -	8.00 -	0.721 -
A2P2-C42-8	1.56 -	1.24 -	1.30 -	1.24 -	5.96 -	11.4 -	1.07 -
A2P2-C42-9	1.24 -	1.09 -	1.10 -	1.09 -	21.8 -	10.3 -	0.811 -
A2P2-C42-11	1.13 -	1.04 -	1.05 -	1.04 -	18.9 -	6.14 -	0.484 -
A2P2-C42-12	1.12 -	0.981 -	1.02 -	0.981 -	26.9 -	5.63 -	0.419 -
A2P2-C42-13	1.13 -	1.00 -	1.08 -	1.00 -	27.2 -	9.14 -	0.622 -
A2P2-C42-14	1.22 -	0.966 -	0.968 -	0.966 -	23.7 -	6.05 -	0.541 -
A2P2-C42-15	1.13 -	0.945 -	0.864 -	0.945 -	31.6 -	6.89 -	0.425 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.56	1.24	1.3	1.24	31.6	11.4	1.07
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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5436

CERTIFICATION UNIT 43

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C43-1	1.22 J	1.12 -	1.13 -	1.12 -	44.9 -	6.61 -	0.489 -
A2P2-C43-2	1.18 J	0.962 -	0.979 -	0.962 -	28.8 -	6.25 -	0.566 -
A2P2-C43-3	1.15 J	1.05 -	1.05 -	1.05 -	28.8 -	6.68 -	0.420 -
A2P2-C43-6	1.22 J	1.13 -	1.12 -	1.13 -	34.4 -	6.79 -	0.870 -
A2P2-C43-7	1.08 J	1.13 -	1.08 -	1.13 -	35.7 -	5.64 -	0.381 -
A2P2-C43-8	0.989 J	1.11 -	1.14 -	1.11 -	29.9 -	7.05 -	0.445 -
A2P2-C43-9	1.14 J	1.06 -	1.07 -	1.06 -	30.4 -	6.58 -	0.465 -
A2P2-C43-10	1.14 J	1.07 -	1.09 -	1.07 -	37.3 -	6.22 -	0.371 -
A2P2-C43-10-D	1.20 J	1.02 -	1.04 -	1.02 -	33.2 -	7.57 -	0.459 -
A2P2-C43-12	1.23 J	1.17 -	1.17 -	1.17 -	31.2 -	6.92 -	0.449 -
A2P2-C43-13	1.06 J	0.985 -	0.990 -	0.985 -	32.3 -	6.28 -	0.475 -
A2P2-C43-14	1.16 J	1.02 -	1.01 -	1.02 -	28.8 -	6.19 -	0.501 -
A2P2-C43-16	1.08 J	1.12 -	1.15 -	1.12 -	29.7 -	6.83 -	0.394 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.23	1.17	1.17	1.17	44.9	7.57	0.87
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--

a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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CERTIFICATION UNIT 44

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C44-1	0.980 -	1.09 -	1.15 -	1.09 -	37.7 -	5.66 -	0.479 -
A2P2-C44-1-D	0.964 -	1.11 -	1.12 -	1.11 -	35.2 -	5.68 -	0.482 -
A2P2-C44-3	0.913 -	1.04 -	1.05 -	1.04 -	28.7 -	5.35 -	0.422 -
A2P2-C44-4	0.936 -	0.909 -	0.884 -	0.909 -	31.6 -	6.25 -	0.447 -
A2P2-C44-5	1.06 -	0.991 -	0.992 -	0.991 -	13.8 -	4.45 -	0.384 -
A2P2-C44-7	1.14 -	1.13 -	1.15 -	1.13 -	29.8 -	4.85 -	0.530 -
A2P2-C44-8	0.930 -	1.09 -	1.07 -	1.09 -	24.9 -	4.82 -	0.537 -
A2P2-C44-10	1.09 -	1.13 -	1.13 -	1.13 -	30.6 -	4.76 -	0.646 -
A2P2-C44-11	0.832 -	1.00 -	0.997 -	1.00 -	29.7 -	5.21 -	0.419 -
A2P2-C44-12	0.960 -	1.06 -	1.08 -	1.06 -	26.4 -	5.25 -	0.382 -
A2P2-C44-13	1.18 -	1.08 -	1.09 -	1.08 -	31.7 -	6.37 -	0.386 -
A2P2-C44-14	1.06 -	1.05 -	1.06 -	1.05 -	31.7 -	6.16 -	0.407 -
A2P2-C44-15	1.39 -	1.20 -	1.20 -	1.20 -	33.4 -	7.41 -	0.572 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.39	1.2	1.2	1.2	37.7	7.41	0.646
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--

a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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CERTIFICATION UNIT 45

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium 226	Radium 228	Thorium 228	Thorium 232	Uranium, Total	Arsenic	Beryllium
A2P2-C45-1	1.15 -	1.09 -	1.09 -	1.09 -	5.01 J	7.94 -	0.711 -
A2P2-C45-3	1.24 -	1.16 -	1.16 -	1.16 -	10.2 J	9.63 -	0.794 -
A2P2-C45-3-D	1.20 -	1.20 -	1.24 -	1.20 -	15.3 J	7.99 -	0.670 -
A2P2-C45-4	1.11 -	0.862 -	0.829 -	0.862 -	11.4 J	6.38 -	0.674 -
A2P2-C45-6	1.23 -	1.16 -	1.19 -	1.16 -	32.3 J	4.58 -	0.522 -
A2P2-C45-7	1.09 -	1.11 -	1.10 -	1.11 -	27.4 J	4.96 -	0.490 -
A2P2-C45-8	1.12 -	1.03 -	1.05 -	1.03 -	32.5 J	6.25 -	0.688 -
A2P2-C45-9	1.05 -	0.983 -	0.973 -	0.983 -	31.4 J	4.76 -	0.420 -
A2P2-C45-10	0.949 -	1.06 -	1.08 -	1.06 -	30.1 J	4.31 -	0.410 -
A2P2-C45-11	1.13 -	1.10 -	1.12 -	1.10 -	35.1 J	3.06 -	0.487 -
A2P2-C45-14	1.26 -	1.17 -	1.14 -	1.17 -	45.6 J	6.05 -	0.517 -
A2P2-C45-15	0.978 -	1.06 -	1.06 -	1.06 -	42.4 J	4.87 -	0.446 -
A2P2-C45-16	0.974 -	1.12 -	1.15 -	1.12 -	33.1 J	4.52 -	0.463 -
Limit	1.7	1.8	1.7	1.5	82.0	12.0	1.5
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
Max. Result	1.26	1.2	1.24	1.2	45.6	9.63	0.794
Max. >= Limit	No	No	No	No	No	No	No
W-statistic Prob. *	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean**	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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APPENDIX B

VARIANCES/FIELD CHANGE NOTICES FOR A2PII-SUBAREAS 1, 2, AND 4 CERTIFICATION PROJECT SPECIFIC PLAN

5436

VARIANCE / FIELD CHANGE NOTICE

Significant? (Yes or No) YES

V/F: 20450-PSP-0004-1

WBS NO.: PROJECT/DOCUMENT/ECDC #20450-PSP-0004 Rev.0

Page: 1 of 1

PROJECT TITLE: Project Specific Plan for Area 2, Phase II – Subareas 1, 2, and 4 Certification Sampling

Date: 1/27/04

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance documents the moves of two boring locations. The affected locations and their moves are as follows:

LOCATION	ORIGINAL NORTHING	ORIGINAL EASTING	DISTANCE and DIRECTION MOVED	NEW NORTHING	NEW EASTING
A2P2-C16-4	478950.2	1346868.71	28 feet east and 12.2 feet south	478937.987	1346896.962
A2P2-C16-8	478894.49	1346902.68	28 feet east and 11.7 feet north	478906.047	1346930.501

Justification:

Sampling locations A2P2-C16-4 and A2P2-C16-8 were originally located on a steep cliff that is the boundary of Paddys Run. The locations were re-located to an area where they could be safely sampled.

Per Section 2.3 of the PSP, any sample location that needs to be relocated more than 3 feet from the original location due to inaccessibility will be documented in a V/FCN and submitted to the agencies for approval prior to collection.

REQUESTED BY: Krista Flaugh Date: 01/27/04

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Frank [signature]	1-27-04	X	PROJECT MANAGER: J.D. Chiou [signature]	1/27/04
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller [signature]	1/27/04
	ANALYTICAL CUSTOMER SUPPORT:			RTIMP Manager	
	WAG		X	Sampling Manager: T. Buhrlage [signature]	1/27/04

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:

ORIGINAL

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VARIANCE / FIELD CHANGE NOTICE

Significant? (Yes or No): NO

V/F: 20450-PSP-0004-2

WBS NO.: PROJECT/DOCUMENT/ECDC # 20450-PSP-0004 Rev.0

PROJECT TITLE: Project Specific Plan for Area 2, Phase II – Subareas 1, 2, and 4 Certification Sampling

Date: 03/30/04

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance/Field Change Notice (V/FCN) documents the collection of surface samples from 7 locations in CU-25 for TAL B to confirm attainment of the secondary ASCOCs FRLs. Sampling of this area was performed per V/FCN 20450-PSP-0001-34 in July of 2003 following the excavation of the radium hot spot. Archive samples were collected for possible analysis of arsenic and beryllium at a later date, but the samples were not stored correctly and the hold time has passed, therefore re-sampling of these locations for TAL B is necessary.

Samples will be collected from the 0-0.5' interval at each location. Attachment 1 lists the sample identification scheme, coordinates, and appropriate TAL for each sample. Attachment 2 lists the TALs and MDLs and the sampling and analytical requirements. One duplicate sample will be collected from the location identified in Attachment 1.

All samples will be analyzed at ALS D and validated at VSL B. Field validation is also required.

This sampling activity will follow DQO SL-052, "Sitewide Certification Sampling and Analysis".

There will be 8 soil samples shipped to an offsite laboratory for metals (TAL B) analysis. The historical data for shipment of these samples is 37 ug/g of total uranium from boring A2P2-PT2-10B.

Justification:

In July 2003 sampling of the former radium hot spot, which is now a part of CU-25, occurred per V/FCN 20450-PSP-0001-34. Seven locations were identified and sampled for primary radionuclides and one archive sample was taken at every location for possible analysis at a later date for arsenic and beryllium. Following sampling of the remaining portion of CU-25 in February 2004 it was determined that all four quadrants of this CU were not represented. Therefore, additional samples must be collected since the archive samples were stored incorrectly and the hold time has passed.

REQUESTED BY: Krista Flaugh — Date: 3/30/04

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE: R. Fiske	3/31/04	X	PROJECT MANAGER: J.D. Chiou	3/30/04
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller	3/30/04
X	ANALYTICAL CUSTOMER SUPPORT:	3-31-04		RTIMP Manager	
	WAO		X	SAMPLING MANAGER: T. Burlage	3/31/04

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:

ATTACHMENT 1
20450-PSP-0004-2

Boring ID	Sample ID	Depth (feet)	Analysis	Northing	Easting
A2P2-RHS-C-1	A2P2-RHS-C-1^1-M	0-0.5	TAL B	1347133.297	478359.606
	A2P2-RHS-C-1^1-M-D	0-0.5	TAL B		
A2P2-RHS-C-2	A2P2-RHS-C-2^1-M	0-0.5	TAL B	1347126.909	478348.972
A2P2-RHS-C-3	A2P2-RHS-C-3^1-M	0-0.5	TAL B	1347120.902	478336.173
A2P2-RHS-C-4	A2P2-RHS-C-4^1-M	0-0.5	TAL B	1347119.053	478359.997
A2P2-RHS-C-5	A2P2-RHS-C-5^1-M	0-0.5	TAL B	1347146.971	478346.155
A2P2-RHS-C-6	A2P2-RHS-C-6^1-M	0-0.5	TAL B	1347110.418	478338.478
A2P2-RHS-C-7	A2P2-RHS-C-7^1-M	0-0.5	TAL B	1347131.063	478342.53

Where
A2P2 = Area 2 Phase II
RHS = Former Radium Hot Spot (CU-25)
C = Certification
1, 2, 3 = Location
1 = 0-0.5' Interval
M = metal constituents
X = Rinsate
Y = Container Blank (determined in the field)

ATTACHMENT 2

TARGET ANALYTE LISTS

TAL 20450-PSP-0001-~~D~~ B Ref 3/31/04
ICP/MS or ICP/AES or GFAA Methods
(ASL D)

Analyte	MDC	MDC for Rinsates/ Container Blanks
Arsenic	1.2 ppm	1.44 ug/ml
Beryllium	0.15 ppm	0.093 ug/ml

SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Method	Sample Matrix	Lab	TAT	ASL	Preserve	Holding Time	Container	Sample Volume/ Mass
Metals (TAL B)	ICP-AES, ICP/MS, or GFAA	Solid	Offsite	2 days	D	Cool, 4° C	6 months	Glass or polyethylene container	50 grams
Metals (TAL B)	ICP-AES, ICP/MS, or GFAA	Liquid (rinsate[a])	Offsite	2 days	D	HNO_3 pH<2	6 months	Glass or polyethylene container	1 liter

[a] If "push tubes" are used for sampling, the offsite laboratories will be sent container blanks. If an alternative sample method is used, then a rinsate will be collected by the field technicians.