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CERTIFICATION REPORT FOR AREA 1, PHASE II

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

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U.S. DEPARTMENT OF ENERGY
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TABLE OF CONTENTS

Executive Summary ES-1

1.0 Introduction 1-1
1.1 Purpose 1-1
1.2 Scope 1-1
1.3 Area Description 1-2
1.4 Objectives 1-3
1.5 Report Format 1-3
1.6 FEMP Certification Master Map 1-4

2.0 Certification Approach 2-1
2.1 Certification Design 2-1
2.1.1 Certification Design for A1PII Sector 1, Sector 2A, and Conveyance Ditch 2-1
2.1.2 Certification Design for A1PII Sector 2B 2-2
2.1.3 Certification Design for A1PII Sector 3 Utility Trenches 2-3
2.1.4 Certification Design for A1PII Sector 2 CUs West of Former NAR 2-3
2.1.5 Certification Design for A1PII Characterize for Reuse Areas, Trap Range, Sector 2 CUs East of Former NAR, and Sector 3 2-4
2.1.5.1 Sector 1 Certification Units 2-6
2.1.5.2 Sector 2 Certification Units 2-8
2.1.5.3 Sector 3 Certification Units 2-9
2.2 ASCOC Selection Process 2-11
2.2.1 ASCOCs for A1PII-S1 Group A CUs, and the Conveyance Ditch CU 2-11
2.2.2 ASCOC Selection for A1PII-S2B 2-12
2.2.3 ASCOCs for Utility Trenches CUs 2-12
2.2.4 ASCOCs for CUs in A1PII Sector 2 West of Former NAR 2-12
2.2.5 ASCOCs for CUs East of Former NAR 2-12
2.3 Statistical Analysis 2-12

3.0 Overview of Field Activities 3-1
3.1 Excavation Activities 3-1
3.1.1 CUs East of Former NAR 3-2
3.1.2 Utility Trench CUs 3-3
3.2 Changes to Scope of Work 3-3
3.2.1 CUs East of Former NAR 3-3
3.2.2 Utility Trench CUs 3-5

4.0 Analytical Methodologies, Data Validation Processes, and Data Reduction 4-1
4.1 Analytical Methodologies 4-1
4.1.1 Radiochemical Methods 4-1
4.2 Data Verification and Validation 4-2
4.3 Data Reduction 4-4

5.0 Certification Evaluation and Conclusions 5-1
5.1 Certification Results and Evaluation 5-1
5.1.1 Certification Design for A1PII Sector 1, Sector 2A, and Conveyance Ditch 5-1
5.1.2 Certification Design for A1PII Sector 2B 5-1
5.1.3 Certification Design for A1PII Sector 3 Utility Trenches 5-1
5.1.4 Certification Design for A1PII Sector 2 CUs West of Former NAR 5-2
5.1.5 Certification Design for A1PII Characterize for Reuse Areas, Trap Range, Sector 2 CUs East of Former NAR, and Sector 3 5-2
5.2 Sludge Drying Bed Hazardous Waste Management Unit Closure 5-2
5.3 Certification Conclusions and Future Land Use 5-2

6.0 Protection of Certified Areas 6-1

References R-1

Appendix A Certification Samples, Analytical Results and Statistics Tables

LIST OF TABLES

Table 1-1 A1PII Certification Status
Table 2-1 ASCOC List for A1PII-S1 Group A CUs and Convevance Ditch CU
Table 2-2 ASCOC List for A1PII-S2A
Table 2-3 ASCOC List for A1PII-S3 Utility Trench CUs
Table 2-4 ASCOC List for All CUs West of Former NAR
Table 2-5 ASCOC List for All CUs in Characterize for Reuse Areas, Trap Range, Sector 2 East of Former NAR
Table 2-6 ASCOC List for Specific CUs East of Former NAR
Table 3-1 Excavation Quantities and Disposition

LIST OF FIGURES

Figure 1-1 A1PII Boundary and Sector Locations
Figure 1-2 FEMP Controlled Certification Map
Figure 2-1 A1PII Certification Design for Sector 1, Sector 2A, and Conveyance Ditch
Figure 2-2 A1PII Sector 2B Certification Units
Figure 2-3 A1PII Sector 3 Utility Trench Certification Units
Figure 2-4 A1PII Sector 2 Certification Units West of the North Access Road
Figure 2-5 A1PII Sector 1 CU Boundaries
Figure 2-6 A1PII Sectors 2 and 3 Certification Units
Figure 5-1 A1PII Sector 1 Trap Range Excavation

LIST OF ACRONYMS AND ABBREVIATIONS

A1PI	Area 1, Phase I
A1PII	Area 1, Phase II
A1PII-S1	Area 1, Phase II Sector 1
A1PII-S2	Area 1, Phase II Sector 2
A1PII-S3	Area 1, Phase II Sector 3
ASCOC	area-specific constituent of concern
ASL	analytical support level
AWWT	Advanced Wastewater Treatment Facility
BTV	Benchmark Toxicity Value
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CG&E	Cincinnati Gas and Electric Company
COC	constituent of concern
CU	certification unit
DOE	U.S. Department of Energy
EIS	East Impacted Stockpile
EPA	U.S. Environmental Protection Agency
FEMP	Fernald Environmental Management Project
FRL	final remediation level
HAMDC	highest allowable minimum detectable concentration
HPGe	high-purity germanium (detector)
HWMU	hazardous waste management unit
LCS	laboratory control sample
µg/kg	micrograms per kilogram
MDC	minimum detectable concentration
mg/kg	milligrams per kilogram
NAR	North Access Road
OEPA	Ohio Environmental Protection Agency
OSDF	On-Site Disposal Facility
OU	Operable Unit
PCE	perchloroethylene
pCi/g	picoCuries per gram
PSP	Project Specific Plan
QA/QC	Quality Assurance/Quality Control
RA14	Removal Action 14
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SER	South Entrance Road
STP	Sewage Treatment Plant

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued)

TPU	total propagated uncertainty
UCL	upper confidence level
V&V	verification and validation
WAC	waste acceptance criteria

EXECUTIVE SUMMARY

This certification report presents the information and data used by the U.S. Department of Energy (DOE) to determine that existing soil concentrations do not exceed the final remediation levels (FRLs) in Area 1, Phase II (A1PII). On the basis of this reported information and supporting project files, DOE has determined that no additional remedial actions are required in this area of the site except with the two certification units (CUs) stated below. With the exception of these two CUs, the remaining CUs can be considered "certified." Upon approval from the regulatory agencies, DOE intends to proceed with future land use activities.

To date, three A1PII certification reports have been submitted to the regulatory agencies. The first report covered 22 CUs in Sector 1, Sector 2A, and the Conveyance Ditch (DOE 1998a). The second report covered four CUs in Sector 2B (DOE 1999a), and the third report covered 13 CUs in Sector 2 west of the North Access Road (NAR, DOE 2000a). The remaining 52 CUs within A1PII are included in this certification report, along with the certification of the underground utility corridors (five CUs) outside the former Sewage Treatment Plant (STP). Certification sampling was conducted in each CU to verify that the certification criteria were achieved. These criteria stated that: 1) the mean concentrations or activities of the primary area-specific constituents of concern (ASCOCs) within a CU were less than the FRLs at the 95 percent upper confidence level (UCL) (90 percent for secondary ASCOCs); and 2) no certification result exceeded two times the FRL (i.e., the "hot spot" criterion). If either of these criteria was not met, then further investigation and possible excavation would have been required. If both of these criteria were met for a CU, then it could be released for final land use. All 50 CUs except two passed both criteria during the first certification event. Additional stabilization treatment, excavation, and recertification were required within a 0.4-acre area in the Trap Range. Remediation in all CUs is now complete and will be considered certified when the U.S. Environmental Protection Agency (EPA) and the Ohio Environmental Protection Agency (OEPA) agree that the certification criteria have been met for A1PII.

The certification samples were analyzed at laboratories on the Fernald Environmental Management Project (FEMP) Approved Laboratories List per the Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ, DOE 1998b). All these samples were analyzed and reported at the required analytical support level (ASL). Analytical data

packages included sample results with associated quality assurance/quality control (QA/QC) data and all applicable raw data. The data were also subjected to the required validation and verification process, which did not identify any significant quality concerns.

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

1.0 INTRODUCTION

1.1 PURPOSE

This certification report presents the information and data used by the U.S. Department of Energy (DOE) to determine that existing soil contamination does not exceed the final remediation levels (FRLs) within Area 1, Phase II (A1PII). This final report for A1PII summarizes previous A1PII certification reports and presents the final certification results for the remaining certification units (CUs) as identified in the A1PII Certified for Reuse Areas, Trap Range, Sector 2C, and Sector 3 Certification Design Letter (CDL, DOE 2000b). On the basis of this reported information in this report and previous certification reports, DOE considers A1PII remedial goals achieved.

1.2 SCOPE

In the Operable Unit 5 (OU5) Record of Decision (ROD, DOE 1996a), DOE committed to excavating contaminated soil that exceeds health-based FRLs, with final disposal of the excavated material in the On-Site Disposal Facility (OSDF) or an off-site disposal facility if the waste acceptance criteria (WAC) are exceeded. The OU5 Remedial Investigation Report (DOE 1995) defined the extent of soil contamination exceeding the FRLs and, in general, indicated widespread contamination in approximately 430 acres of the 1,050-acre Fernald Environmental Management Project (FEMP). Approximately 1.8 million cubic yards of contaminated soils are anticipated to be excavated and placed within the OSDF.

In the OU5 Remedial Action Work Plan (RAWP, DOE 1996b), DOE committed to preparing a Sitewide Excavation Plan (SEP, DOE 1998c), defining the overall approach to implementing the soil, and at- and below-grade debris, cleanup obligations identified in the OU2, OU3, and OU5 RODs. The FEMP is divided into distinct remedial areas and phases; this report addresses A1PII. As discussed in the A1PII Supplemental Characterization Package (DOE 1999b), certification for A1PII proceeded in an iterative manner. The A1PII area was divided into sectors and certification was performed within sectors as the areas became available. Figure 1-1 shows the A1PII boundaries, sectors, and primary features. Prior to performing any certification activities, a CDL was prepared and submitted for agency approval. Four CDLs were prepared for A1PII. The first CDL covered Sector 1, Sector 2A, and the Conveyance Ditch and consisted of a total of 22 CUs (DOE 1997). The second CDL covered A1PII Sector 2B (DOE 1999c), which consisted of four CUs in Sector 2. The third CDL consisted of five CUs and

covered the Utility Trenches for abandoned underground utilities removed during Sewage Treatment Plant (STP) excavation in Sector 3 (DOE 1999d). The remaining areas in A1PII not covered under the previously described CDLs were within the scope of the CDL for A1PII Certified for Reuse Areas, Trap Range, Sector 2C, and Sector 3 (DOE 2000b). It consisted of a total of 65 CUs, 13 west of former North Access Road (NAR) and 52 east of the former NAR. Two additional CUs west of the former NAR were added as a result of certification failure within the former Trap Range area.

To date, three certification reports have been submitted to the agencies. The first report covered Sector 1, Sector 2A, and the Conveyance Ditch (DOE 1998a). The second report covered Sector 2B (DOE 1999a), and the third report covered 13 CUs in Sector 2 west of the NAR (DOE 2000a). The remaining CUs within A1PII are included in this certification report. Table 1-1 summarizes the CDLs and Certification Reports that have been submitted and the current status.

1.3 AREA DESCRIPTION

As shown in Figure 1-1, the A1PII area is divided into three sectors. A1PII Sector 1 (A1PII-S1) is an approximately 80-acre area located south and east of the former production area, south of the STP, and east of the South Entrance Road (SER). A1PII-S1 also includes an approximately 4-acre outfall area west of the SER, which was characterized for reuse, the area identified as the Trap Range, a sedimentation basin, and run-on, run-off control ditches for the Trap Range.

The Sector 2 (A1PII-S2) area is approximately 25 acres northwest of the NAR, south of the A1PI certified area. Sector 2 was divided into Sector 2A, 2B, and 2C as shown in Figure 1-1. These sub-sectors were created to accommodate construction activities. The primary features of this area include sedimentation basins, stockpile footprints, and the OSDF temporary and interim leachate lines.

The Sector 3 (A1PII-S3) area is approximately 35 acres north of A1PII-S1 and south of A1PII-S2. The three primary features of A1PII-S3 are the conveyance channel, the underground utilities, and the former STP area. The conveyance channel, also referred to as the conveyance ditch, is a long corridor approximately 50 feet wide and 600 feet long (approximately two thirds of an acre) and is designed to accommodate drainage for the A1PI and A1PII areas. The conveyance channel was characterized for reuse prior to construction activities, and final certification is being presented in this report. As part of the remedial action work in A1PII-S3, underground utilities were removed from the STP area to the

western boundary of A1PII. These utility trenches were certified during the excavation, and the data are presented in this report. Additional remedial action work in A1PII-S3 included below grade demolition of the STP and surface stripping of the surrounding area. The STP area contained the Sludge Drying Beds hazardous waste management unit (HMWU), which required special considerations during remediation and certification.

A more detailed description of each area and the CUs is provided in Section 2.0. Note that two areas within the original A1PII area are not included in this report, as shown in Figure 1-1 and noted in the CDL. The Dissolved Oxygen Facility area, in the southeast portion of A1PII-S3, will be certified as part of Area 10 after all remedial activities at the FEMP have been completed. The second area, located in A1PII-S2 along the western border where the Interim Leachate Line is currently located, includes an approximate 0.5-acre parcel south of A1PI, where the Equipment Wash Facility is located. Once the Interim Leachate Line and Equipment Wash Facility are removed, an addendum to this report will be provided. A CDL for these areas will be provided prior to certification.

1.4 OBJECTIVES

The objectives of this Certification Report are:

- Provide an overview of previous certification activities conducted in A1PII
- Describe the analytical methods, data validation processes, data reduction and statistical processes used to support the certification process
- Present the statistical analysis of the sampling results for all the CUs within A1PII, which show the certification criteria, including FRL attainment and hot spot criteria, have been met
- Describe access controls implemented to prevent recontamination.

1.5 REPORT FORMAT

This certification report is presented in six sections with supporting documentation and data in Appendix A. A summary of pertinent information from the three previous certification reports and previous CDLs is provided in each section. The information is grouped by the following certification activities:

- A1PII Sector 1, Sector 2A, and Conveyance Ditch
- A1PII Sector 2B
- A1PII Sector 3 Utility Trenches
- A1PII Sector 2 CUs West of Former NAR
- A1PII Characterize for Reuse Areas, Trap Range, Sector 2 CUs East of the Former NAR, and Sector 3.

The sections of this report are as follows:

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

1.6 FEMP CERTIFICATION MASTER MAP

In order to track certification and characterization for reuse areas at the FEMP, DOE has included a controlled map (Figure 1-2) showing the status of the soil remediation areas and phased areas with all Certification Reports and CDLs. Note that this figure has been revised to show the certification status of the NAR in Area 1, Phase I (A1PI) and A1PI certification status. This map also shows the areas that have not yet been certified including the Dissolved Oxygen Facility area, the OSDF Equipment Wash Facility, and the Interim Leachate Line.

TABLE 1-1
A1PII CERTIFICATION STATUS

CDL Scope	CDL Submittal	Certification Report
Sector 1, Sector 2A, and Conveyance Ditch	Complete	Complete – Approved
Sector 2B	Complete	Complete – Approved
Sector 3 Utility Trenches	Complete	Data Presented in this Document
Certified for Reuse Areas, Trap Range, Sector 2C, and Sector 3	Complete	Submitted in two Parts: 1. 13 CUs in Sector 2 west of NAR. 2. Remainder of CUs presented in this document.

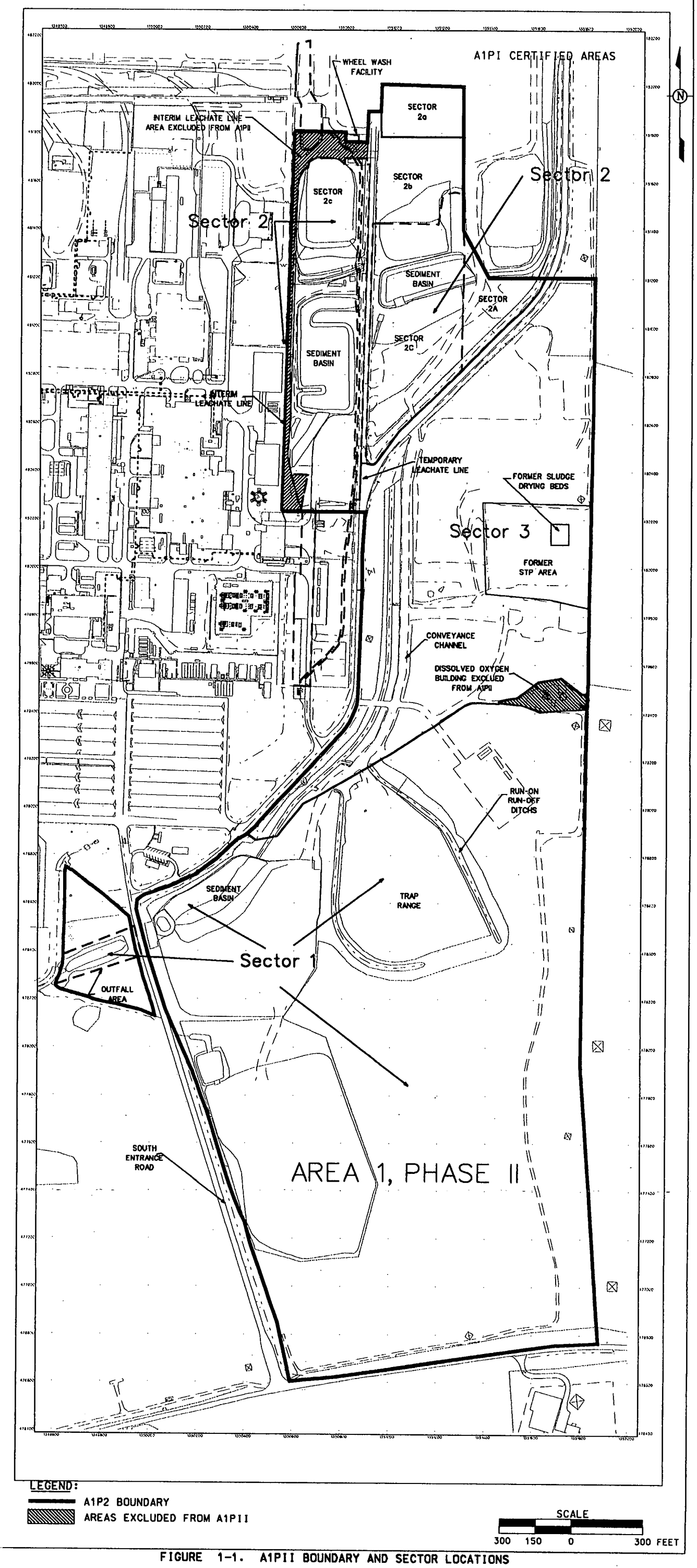
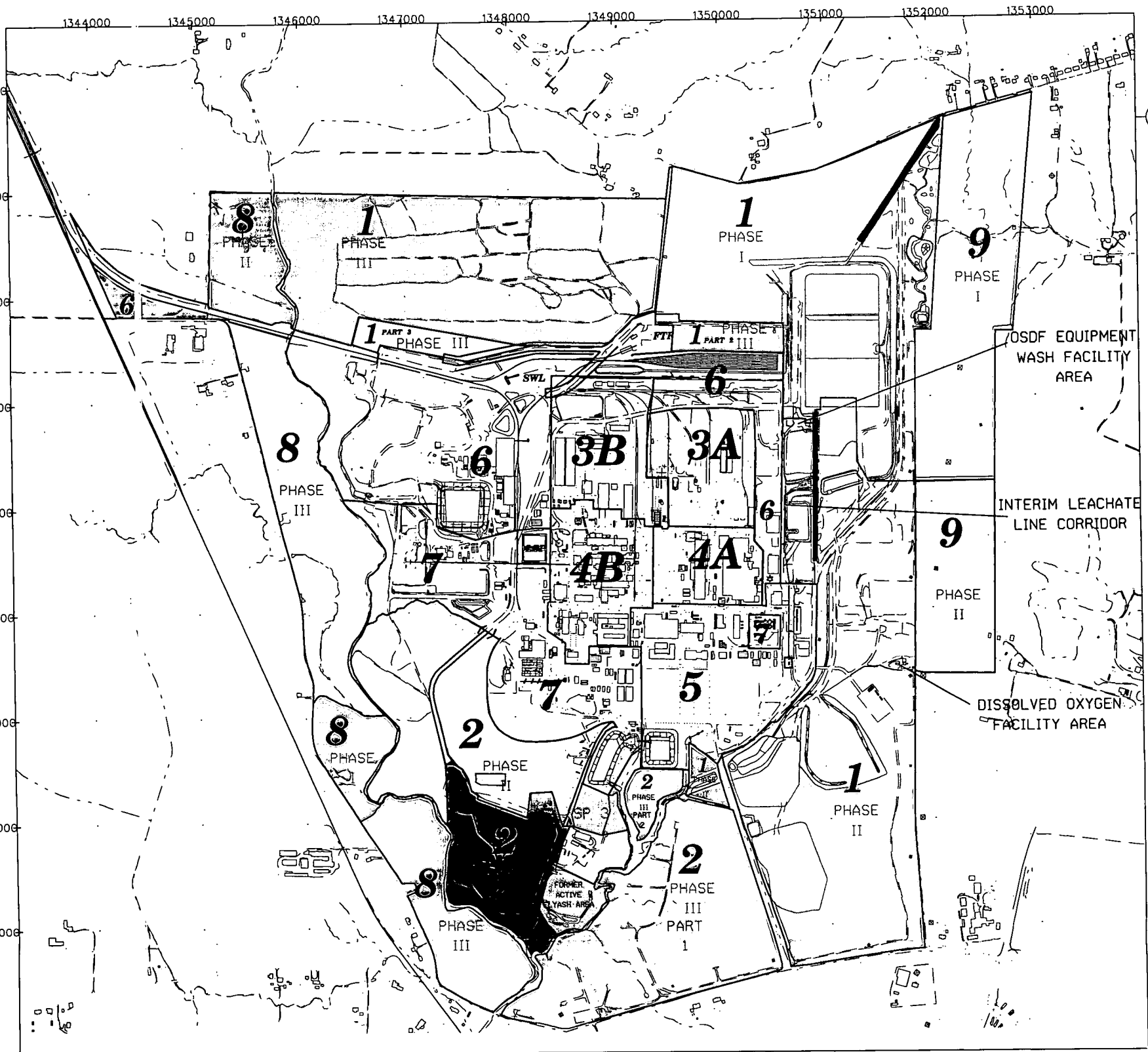


FIGURE 1-1. A1PII BOUNDARY AND SECTOR LOCATIONS



LEGEND:

APPROVED CERTIFICATION AREAS (348 ACRES TOTAL)

- A1PI APPROVED CERTIFIED AREAS - 120.5 ACRES
- A1PI SEDIMENT TRAPS 2 AND 3 APPROVED CERTIFIED AREAS 1.4 ACRES
- A1PII APPROVED CERTIFIED AREAS - 80.1 ACRES
- A1PII-S2B APPROVED CERTIFIED AREAS 1.5 ACRES
- A8PIII APPROVED CERTIFIED TO DATE USEPA ONLY - 28.2 ACRES
- A8PII/A6TA APPROVED CERTIFIED AREA - 22.1 ACRES
- A8PI APPROVED CERTIFIED AREAS - 12.5 ACRES
- A2PIII APPROVED CERTIFIED AREA - 70 ACRES
- A1PII APPROVED CERTIFIED AREAS WEST OF OLD NORTH ACCESS ROAD - 11.9 ACRES

CERTIFICATION AREA, SEPARATE REPORT PRESENTLY UNDER AGENCY REVIEW - 55.9 ACRES

A1PI ROADS EXCLUDED FROM CERTIFICATION

CERTIFICATION IN PROGRESS

REMEDIATION IN PROGRESS

CHARACTERIZATION FOR REUSE AREAS - 2.5 ACRES

NON CERTIFIED AREAS

NOTE: SUBSURFACE SOIL IN UTILITY CORRIDORS WITHIN THE FORMER ACTIVE FLYASH AREA CERTIFICATION AREA WILL BE CERTIFIED AT A LATER DATE.

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FIGURE 1-2. FEMP CONTROLLED CERTIFICATION MAP

2.0 CERTIFICATION APPROACH

2.1 CERTIFICATION DESIGN

This section summarizes the certification design for the CDLs presented in Section 1.0, the area-specific constituent of concern (ASCOC) selection process, and statistical analyses. The general purpose of certification sampling is to verify that the mean concentrations or activities of primary ASCOCs remaining in a CU's soil following remedial activities are less than the FRLs at the 95 percent upper confidence level (UCL), and at the 90 percent UCL for secondary ASCOCs. The certification process also includes the hot spot criterion, which states that if any certification sample exceeds two times the FRL, further action is required as discussed in Section 2.2.5. 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 final land use. The general certification strategy is described in Section 3.4 of the SEP (DOE 1998c).

2.1.1 Certification Design for A1PII Sector 1, Sector 2A, and Conveyance Ditch

The certification design for A1PII-S1 CUs followed the general approach outlined in Section 3.4 of the SEP. The CUs are shown in Figure 2-1. The CUs were assigned as approximately 500-feet by 500-feet areas (Figure 2-1). AIPII-S1 consisted of 19 CUs, A1PII-S1-01 through A1PII-S1-19. The A1PII Sector 2A CUs (A1PII-S2A-01 and A1PII-S2A-02), which were considerably smaller than the nominal 500 feet by 500 feet, were classified as separate CUs. The conveyance ditch is a long, narrow corridor that was treated as a single CU. Several areas in this certification effort were characterized for reuse. Once these areas passed certification, they were developed to support construction activities prior to STP excavation activities. The final certification information for these areas is summarized below:

1. The entire conveyance ditch (CU A1PII-S3-CD) area was certified for reuse, with the soil excavated treated as non-impacted material, except for the northern portion of the channel. The final certification data for this area are presented in this report.

2. The small area on the SER connecting CUs A1PII-S1-01 to the CUs east of the SER was characterized for reuse. Final certification will be done as part of Area 10.

3. The small area on the STP Access Road connecting the A1PII-S3-CD and A1PII-S1-03. Final certification is presented in this report.

4. The entire outfall drainage area west of the SER, which includes all of CU A1PII-S1-01. Since only a portion of the outfall area was disturbed, only the area receiving drainage required recertification. The final certification data are presented in this report.

5. The location of A1PII sediment basin, which includes the majority of CU A1PII-S1-03. Final certification data are presented in this report.

6. The run-on and run-off ditches for the Trap Range, which will be constructed after certification. These ditches fall into CU A1PII-S1-19 as shown in Figure 2-1, and final certification data are presented in this report.

2.1.2 Certification Design for A1PII Sector 2B

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

1. CU A1PII-S2B-NAR1 - Established to cover the soil beneath the paved portion of the NAR in the northern portion of A1PII-S2B.

2. CU A1PII-S2B-NAR2 - Established to cover the soil beneath the paved portion of the NAR in southern portion of A1PII-S2B.

3. CU A1PII-S2B-NAR3 - Established to cover the ditch along the west side of the NAR to the southern part of the certified area, and the ditch on the east side of the NAR in northern portion of A1PII-S2B. Since the NAR ditches receive run-off from the NAR and uncertified areas, this CU consisted only of areas which receive run-off from certified areas. Also, since this CU is not contiguous, all 16 samples were collected and analyzed.

4. CU A1PII-S2B-EIS - Established to contain the footprint of the East Impacted Stockpile (EIS).

The sample location selection process was described in the CDL for A1PII-S2B, and was consistent with the approach outlined in Section 3.4.2 of the SEP except for CU A1PII-S2B-NAR3 since the CU is not contiguous. The 16 sample locations were allocated between the ditches (east of the NAR and west of the NAR) based on the respective lengths, with the west ditch receiving five sample locations and the east 11 sample locations.

2.1.3 Certification Design for A1PII Sector 3 Utility Trenches

The certification design for A1PII-S3UT followed the general approach outlined in Section 3.4 of the SEP. Since A1PII-S3UT included non-high density, polyethylene pipelines, Approach F from the SEP was used as a basis for certification design, as described in Section 4.1 of the SEP. The following five CUs were located within A1PII-S3UT as shown in Figure 2-3:

- CU A1PII-S3UT-01 - This CU consists of the northern-most trench, labeled Trench 1 on Figure 2-3, and contained a 4-inch drinking water pipe
- CU A1PII-S3UT-02 - This CU is in Trench 2, which contained the an 8-inch sanitary sewer pipe
- CU A1PII-S3UT-03 - This CU is in Trench 2, which contained a 3-inch drinking water pipe, a 12-inch waste water effluent pipe, and a 4-inch fuel gas line
- CU A1PII-S3UT-04 - This CU is in Trench 3, which contained an electrical conduit
- CU A1PII-S3UT-05 - This CU is in Trench 4, which contained a 16-inch storm sewer and a 4-inch fuel gas line.

Certification sampling locations were selected following the general requirements of Section 3.4.2 of the SEP. The primary requirement was that sample locations meet the minimum distance criterion for the CU. Since all the CUs had a trench configuration, the process for selecting the sample points was consistent with the certification sample location process for the ditch CUs in A1PII Sector 2B.

2.1.4 Certification Design for A1PII Sector 2 CUs West of Former NAR

The certification design for the 13 CUs followed the general approach outlined in Section 3.4 of the SEP. Because most of the CUs included a shallow excavation of impacted soil, Approach A from the SEP was used as a basis for certification design, as described in Section 4.1 of the SEP. All the CUs were Group 1 CUs, which can be as large as 62,500 square feet. As shown on Figure 2-4, the following CUs were located in Sector 2 west of the NAR:

- A1P2-S2NI-01 - Non-impacted area between certified former NAR and other structures, including OSD-007 footprint and the Sedimentation Basin
- A1P2-S2NI-02 - Non-impacted area bordering the production area fenceline and the sedimentation basin

- A1P2-S2NI-07 - Non-impacted area bordering the production area fenceline and the sedimentation basin
- A1P2-S2NI-08 - Non-impacted area adjacent to OSD-007 footprint and west side of the A1P2 boundary
- A1P2-S2SP-01 - Excavated footprint of West Impacted Stockpile
- A1P2-S2SP-02 - Area around the excavated footprint of West Impacted Stockpile
- A1P2-S2SP-04 - Excavated footprint of OSD-007 Stockpile
- A1P2-S2SB-01 - Northern portion of the footprint of the S-shaped sedimentation basin, also referred to as the OSDF Sedimentation Basin
- A1P2-S2SB-02 - Southern portion of the footprint of S-shaped sedimentation basin
- A1P2-S2SB-04 - Sediment Basin south of former location of West Impacted Material Stockpile
- A1P2-S2LL-01 - The abandoned Leachate Conveyance System footprint
- A1P2-S2LL-02 - The southern section of the Permanent Leachate Line
- A1P2-S2OS-01 - Excavated footprint of the West Debris Stockpile and surrounding area.

The sample location selection process was described in the CDL, and was consistent with the approach in Section 3.4.2 of the SEP. As discussed in the Project Specific Plan (PSP) for Certification Sampling of A1PII Certified for Reuse Areas, Trap Range, Sector 2C, and Sector 3B (DOE 2000c), discrete soil samples were collected from the 12 random sampling locations. Each sample was collected from the 0 to 6-inch (surface) soil interval at the designated and surveyed sample point. The only exception was CU A1P2-S2LL-01, where all 16 samples were collected at depth beneath the leachate line bedding in the top 6 inches of undisturbed, native soil.

2.1.5 Certification Design for A1PII Characterize for Reuse Areas, Trap Range, Sector 2 CUs East of Former NAR, and Sector 3

The certification design followed the general approach outlined in Section 3.4 of the SEP. Several considerations were used in the CU design, including the following:

- Excavation Approach: The following approaches were used: Approach A, Shallow Excavation of Impacted On-Property Areas; Approach D, Excavation Following Decontamination and Dismantlement in the Former Production Area, STP, Fire Training Facility, Approach E, Off-Property and Non-Impacted On-Property Area Certification. Each CU design took the excavation approach into consideration.

- Trap Range Excavation Area: The initial CUs within the Trap Range area were designed based on the stabilization and excavation footprint. Two additional CUs were designed around a 0.4-acre area which failed certification for lead and arsenic. These two CUs were considered Group 1 CUs, and were no larger than 62,500 square feet.

- Certified for Reuse CUs: Previous certification efforts within A1PII included several CUs that were certified for reuse. These areas included the Conveyance Ditch (CU A1PII-S3CD-01), the Trap Range run-on and run-off ditches (A1PII-S1-19), the sedimentation basin in Sector 1 (CU A1PII-S1-03), and the outfall area in Sector 1 (CU A1PII-S1-01) from the A1PII Sector 1, Sector 2A, and Conveyance Ditch certification effort. These areas were re-sampled for final certification and were considered Group 1 CUs.

- Stripping Areas: Within A1PII, areas specifically adjacent to the STP as a result of surface contamination were stripped 6 inches. Boundaries were often defined by these Group 1 CUs with the exception of two small triangular areas, which were included in CU A1P2-S2SA-01.

- Sedimentation Basins: Several sedimentation basins existed within the certification area, and were treated as separate CUs. Berms surrounding sedimentation basins were also treated as separate CUs. These CUs were considered Group 1 CUs.

- Haul and Access Roads: Several haul and access roads existed within the certification area. Each road was treated as its own Group 1 CU.

- Deep Excavation Areas: In the former STP area several deep excavations occurred. These areas were used to determine these Group 1 CU boundaries.

- FRL Limits: The STP area had two FRLs for total uranium. The east side of the STP had a FRL of 82 milligrams per kilogram (mg/kg) for total uranium, the west side had a FRL of 20 mg/kg.

- Non-Impacted Areas: Several areas based on predesign and precertification data did not require any remedial actions. These areas were considered Group 2 CUs, with a maximum area of 250,000 square feet.

- HWMUs: Within the former STP area, the Sludge Drying Beds were considered an HWMU. As required by the SEP, the HWMU footprint had a minimum of eight samples.

- Stockpile Footprints: Several stockpiles were located in the area to be certified. The stockpile footprints were used as Group 1 CU boundaries.

- Removal Action 14 (RA14): The footprint of the excavations performed during RA14 activities were considered in the design of the CUs. Two Group 1 CUs covered the affected area.

Using the considerations noted above, the resulting number of CUs is 52; 16 within Sector 1, 8 in Sector 2 east of the former NAR, and 28 in Sector 3. The CU design is shown on Figures 2-5 and 2-6 and the following is a description of each CU and the basis for its design.

2.1.5.1 Sector 1 Certification Units

The primary excavation approach in Sector 1 was Approach A. The following considerations were used in CU design:

Trap Range Excavation Area: Within the Trap Range area there were four distinct areas which help set the initial CU boundaries. These areas included:

- Six-inch stabilization and excavation of the lead area which occurred at two locations within the Trap Range area. A small area in the northern section, and a much larger area in southern portion.
- Twelve-inch stabilization and excavation area including adjacent 6-inch stripping areas and spread soil excavation during site preparation designated for stabilization, which is a small area in the southern portion which is the 6-inch stabilization area.
- Area within the Trap Range but out of the stabilization and excavation area.
- The run-off and run-on control ditches that surround the Trap Range. This area was certified for reuse under the A1PII Sector 1, Sector 2A, and Conveyance Ditch certification effort as CU A1PII-S1-19.

Trap Range Failed Certification Area: Two of the initial Trap Range CUs (A1P2-S1TR-01 and A1P2-S1TR-03) failed certification. CU 01 failed the "hot spot" critierion for the lead ASCOC and CU 03 statistically failed for the arsenic ASCOC. An 0.4-acre remediation area was designed for a 6-inch excavation to encompass the failing sample locations within the CUs. In addition, a 15-foot by 30-foot by 3-inch deep area within the 0.4-acre remediation was designated for lead stabilization treatment. After the stabilization and 6-inch excavation were complete, the 0.4-acre remediation footprint was considered its own Group 1 CU (A1P2-S1TR-12). Subsequent certification failure of this CU for the arsenic ASCOC resulted in excavation of an additional 18-inches and recertification of the 0.4-acre area as CU A1P2-S1TR-13.

Sedimentation Basin and Outfall Area: During the certification of A1PII Sector 1, Sector 2a, and the Conveyance Ditch, several areas were certified for reuse. Three of these areas are within Sector 1, the Trap Range run-on and run-off ditches (A1PII-S1-19), sedimentation basin (A1PII-S1-03) and the outfall (A1PII-S1-01) area.

As shown on Figure 2-5, the following CUs were located in Sector 1:

- A1P2-S1TR-01 - Represented the location of the stabilization of Trap Range soils at 10 and 12-inch depths prior to excavation
- A1P2-S1TR-02 - Represented the remaining stabilized soils at a 6-inch depth; a portion along its northwest boundary was stripped of soil in which stabilization was not necessary but broken sheet clay pigeons were found
- A1P2-S1TR-03 - Represented the remaining stabilized soils at a 6-inch depth
- A1P2-S1TR-04 - Represented the remaining stabilized soils at a 6-inch depth
- A1P2-S1TR-05 - Portion of the non-stabilized, non-excavated portion of the Trap Range
- A1P2-S1TR-06 - Portion of the non-stabilized, non-excavated portion of the Trap Range
- A1P2-S1TR-07 - Portion of the non-stabilized, non-excavated portion of the Trap Range
- A1P2-S1TR-08 - Portion of the Trap Range run-on and run-off control ditches. Part of the final certification of CU A1PII-S1-19 that was certified for reuse
- A1P2-S1TR-09 - Portion of the Trap Range run-on and run-off control ditches. Part of the final certification of CU A1PII-S1-19 that was certified for reuse
- A1P2-S1TR-10 - Portion of the Trap Range run-on and run-off control ditches. Part of the final certification of CU A1PII-S1-19 that was certified for reuse
- A1P2-S1TR-11 - Footprint of lead stabilization and excavation area in north part of Trap Range
- A1P2-S1TR-12 - Footprint of the 0.4-acre portion of the trap range where additional lead stabilization and excavation occurred. This area initially failed certification because of a lead hot spot and arsenic contamination.
- A1P2-S1TR-13 - CU A1P2-S1TR-12 failed for arsenic and additional excavation was required. The excavation footprint for this CU has the same boundaries as CU A1P2-S1TR-12.

- A1P2-S1SB-01 - Portion of CU A1PII-S1-03 that was certified for reuse prior to the construction of the sedimentation basin. This portion of the CU was above the maximum designed high water limit in the sedimentation basin

- A1P2-S1SB-02 - Portion of CU A1PII-S1-03 that was certified for reuse prior to the construction of the sedimentation basin. This portion of the CU was below the maximum designed high water limit in the sedimentation basin

- A1P2-S1OF-01 - This CU is the final certification of a portion of the certified for reuse CU A1PII-S1-01. The area of this CU was smaller than the original A1PII-S1-01 CU. The area of the current CU was the location of the water flow from the A1PII sedimentation basin, which was the area most likely to exceed FRL. Since the A1PII-S1OF-01 has been certified, the entire certified for reuse area A1PII-S1-01 can be considered certified.

Note: Even though the original certified for reuse A1PII-S1-19 was considered a Group 2 CU, the final certification of this CU was done in three CUs since the area is now considered a Group 1 CU.

2.1.5.2 Sector 2 Certification Units

The primary excavation approach within Sector 2 was Approach A, and the following considerations were used for design of the CUs east of the NAR:

- Sedimentation Basins: The abandoned clean sedimentation basin in the northeast portion of Sector 2 was treated as its own Group 1 CU.

- Stockpile Footprints: Several stockpiles were located in the eastern portion of Sector 2, including the East Impacted Soil and Debris Stockpile, and the West Debris Stockpile. These stockpile footprints were used to determine Group 1 CU boundaries.

As shown on Figure 2-6, the following CUs are located in eastern portion of Sector 2:

- A1P2-S2NI-03 - Non-impacted area which contains footprint of former OSDF contractor support area

- A1P2-S2NI-04 - Non-impacted area north of former contractor support area and south of A1PI Sedimentation Basin

- A1P2-S2NI-05 - Non-impacted area south of Borrow Area Haul Road and north of relocated NAR

- A1P2-S2NI-06 - Non-impacted area bordering East Impacted Stockpile footprint and former NAR

- A1P2-S2SP-03 - Excavated footprint of remaining East Impacted Stockpile and Debris Pile

- A1P2-S2SA-01 - Area east former NAR which includes two small triangle stripping areas

- A1P2-S2SB-03 - A1PI Sedimentation Basin

- A1P2-S2HR-01 - Portion of the Borrow Area Haul Road in the non-certified area.

2.1.5.3 Sector 3 Certification Units

The excavation approaches within Sector 3 include Approach A, D and E, and the following considerations were used in CU design:

- Stripping Areas: Approximately 40 acres adjacent to the STP were stripped 6 inches. Boundaries were often defined by these Group 1 CUs.

- Haul and Access Roads: Several Haul and Access Roads exist within Sector 3, including the STP Access Road, the STP Haul Road, and the Borrow Area Haul Road. Each road was treated as its own Group 1 CU.

- Deep Excavation Areas: In the former STP area several deep excavations occurred. These areas we used to determine these Group 1 CU boundaries.

- FRL Limits: The STP area has two FRLs for total uranium. The east side of the STP has a FRL of 82 mg/kg for total uranium, the west side has a FRL of 20 mg/kg.

- Non-Impacted Areas: Several areas based on predesign and precertification data did not require any remedial actions. These areas are considered Group 2 CUs, with a maximum area of 250,000 square feet. In Sector 3 these areas are located south of the former STP plant, and adjacent to the Access Road.

- Hazardous Waste Management Unit Areas: The Sludge Drying Beds within the former STP area are considered a HWMU. As required by the SEP, the HWMU footprint will contain at the minimum eight samples.

- Stockpile Footprints: Stockpile NAR-007 footprint is located in Sector 3. The footprint and adjacent stripping area were used to form a Group 1 CU.

- Removal Action 14: The footprint of the excavations performed during RA14 activities were considered in the design of the CUs. Two Group 1 CUs cover the affected area.

As shown on Figure 2-6, the following CUs are located in Sector 3:

- A1P2-S3CD-01 - Southern portion of the Conveyance Ditch, which includes riprap where the water flowed through into the Sediment Basin. This CU was previously certified. Therefore, the CU is greater than 250 feet by 250 feet but less than 500 feet by 500 feet
- A1P2-S3CD-02 - Northern portion of the Conveyance Ditch
- A1P2-S3NI-01 - Southern non-impacted area between NAR and Conveyance Ditch
- A1P2-S3NI-02 - Non-impacted area between NAR and Conveyance Ditch
- A1P2-S3NI-03 - Non-impacted area south of the stripping area
- A1P2-S3NI-04 - Non-impacted area
- A1P2-S3NI-05 - Non-impacted area south of STP
- A1P2-S3NI-06 - Non-impacted area north of stripping area and south and NAR
- A1P2-S3NI-07 - Ditch line along relocated NAR
- A1P2-S3HR-01 - Southern area of Borrow Area Haul Road
- A1P2-S3HR-02 - Current STP and Contractor Support Area Access road
- A1P2-S3HR-03 - Northern portion of Borrow Area Haul Road
- A1P2-S3HR-04 - STP Haul Road
- A1P2-S3HR-05 - Portion of non-certified relocated NAR
- A1P2-S3SA-01 - Southwest portion of stripping area disturbed by trenches
- A1P2-S3SA-02 - Portion of stripping area bordering southwest corner of STP
- A1P2-S3SA-03 - Western portion of stripping area bordering Borrow Area Haul Road
- A1P2-S3SA-04 - Portion of stripping area bordering west STP boundary
- A1P2-S3SA-05 - Northwest portion of stripping area
- A1P2-S3SA-06 - Northern portion of stripping area
- A1P2-S3SA-07 - Northeastern portion of stripping area
- A1P2-S3SA-08 - Northeastern portion of stripping area

- A1P2-S3SA-09 - Portion of stripping area north of STP border, contains RA14 excavation footprint

- A1P2-S3SA-10 - Most northern portion of the stripping area contains removed stockpile NAR-007 footprint

- A1P2-S3SA-11 - Portion of stripping area north of STP border, contains RA14 excavation footprint

- A1P2-S3DP-01 - Western portion of the deep excavation footprint within the STP area, also a 20 mg/kg total uranium FRL area

- A1P2-S3DP-02 - Eastern portion of the deep excavation footprint within the STP area, excluding the Sludge Drying Beds. This area is an 82 mg/kg total uranium FRL area

- A1P2-S3HW-01 - Includes footprint of HWMU Sludge Drying Beds and adjacent areas.

2.2 ASCOC SELECTION PROCESS

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

- It was listed as a soil constituent of concern (COC) in the OU5 ROD

- It could be traced to site use, either through process knowledge or known release of the constituent to the environment

- Analytical results indicated the contaminant was present at a concentration above its FRL, and the above-FRL concentrations were not attributable to false positives or elevated contract required detection limits

- Physical characteristics of the contaminant, such as degradation rate and volatility, indicated it was likely to persist in the soil between time of release and remediation

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

Using this process, the ASCOCs were identified in each CDL and are summarized below.

2.2.1 ASCOCs for A1PII-S1 Group A CUs and the Conveyance Ditch CU

Total uranium, radium-226, and radium-228 are sitewide primary COCs and were retained as ASCOCs for this reason, even though historical data did not indicate any FRL exceedances in the area. Due to their classification as sitewide primary COCs and some suspect detections in the area, both thorium-228

and thorium-232 were retained as ASCOCs during the certification process. Lead was not detected above the FRL in A1PII-S1 Group A CUs; however, there were above-FRL detects along the Trap Range common boundary (Figure 2-1). To ensure lead contamination did not extend beyond the designated boundary, lead was retained as an ASCOC for certification only in CUs bordering the Trap Range.

Table 2-1 summarizes the ASCOCs for the A1PII-S1 Group A CUs and the Conveyance Ditch CU. Note that all ASCOCs are primary ASCOCs, except arsenic and lead.

2.2.2 ASCOC Selection for A1PII-S2B

The two small, non-contiguous areas comprising A1PII-S2A were certified in conjunction with A1PII-S1 Group A CUs to facilitate short-term OSDF construction requirements. Since the ASCOC selection process for A1PI included these areas, and due to their congruity with A1PI, these two locations were certified using the A1PI ASCOC list except for cesium-137 and thorium-230 (see Table 2-2).

2.2.3 ASCOCs for Utility Trench CUs

The ASCOC selection process for the CUs is described in the CDL. The ASCOC list for Utility Trench CUs is in Table 2-3.

2.2.4 ASCOCs for CUs in A1PII Sector 2 West of Former NAR

The ASCOC selection process for the 13 CUs is described in the CDL. The ASCOC list for the 13 CUs in A1PII Sector 2 west of the former NAR is in Table 2-4.

2.2.5 ASCOCs for CUs East of Former NAR

The ASCOC selection process for the initial 50 CUs east of NAR is described in the CDL. The ASCOCs selected for the two additional Trap Range CUs were based on the certification failure for arsenic and lead. Table 2-5 lists the ASCOCs for all the CUs and Table 2-6 ASCOCs for specific CUs as described in the CDL.

2.3 STATISTICAL ANALYSIS

The statistical analysis of certification samples is discussed in Appendix G 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 the FRL. If any sample result 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, then the first criterion is to compare the 95 percent UCL on the mean of each primary ASCOC to its FRL, resulting in the pass/fail decision on each individual CU. If the data distribution was not normal or lognormal, the appropriate non-parametric approach, discussed in the revised Appendix G of the SEP, was used to evaluate the 95 percent UCL on the mean. The second criterion is related to the hot spot criterion, which states that if a certification sample for a primary radiological ASCOC exceeds two-times the FRL, then further action is necessary as shown on Figure 3-11 of the SEP. Specifically, if the contamination is not widespread in the CU and is limited to an individual sample location, the high-purity germanium (HPGe) detector will be used to delineate the area as described in Section 3.3.3 of the User Guidelines, Measurement Strategies, and Operational Factors for Deployment of In-Situ Gamma Spectrometry at the Fernald Site (Users Manual, DOE 1998d). If the area is less than 10 square meters (m^2) then the acceptable concentration is three times the FRL. If the area is larger than 10 m^2, then the acceptable concentration is 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 has met both criteria and will be considered certified.

TABLE 2-1
ASCOC LIST FOR A1PII-S1 GROUP A CUs AND CONVEYANCE DITCH CU

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
Arsenic	12 mg/kg	Detected above FRL in A1PII-S1 data
Thorium-228	1.7 pCi/g	Detected above FRL in A1PII-S1 data, and Primary ASCOC
Thorium-232	1.5 pCi/g	Detected above FRL in A1PII-S1 data, and Primary ASCOC
Lead	400 mg/kg	Retained for CUs adjacent to the Trap Range

pCi/g – picoCuries per gram

TABLE 2-2
ASCOC LIST FOR A1PII-S2A

Primary ASCOC	FRL	Secondary ASCOCs	FRL
Total Uranium	82 mg/kg	Arsenic	12.0 mg/kg
Thorium-232	1.5 pCi/g	Beryllium	1.5 mg/kg
Thorium-228	1.7 pCi/g	Aroclor-1260	0.13 mg/kg
Radium-226	1.7 pCi/g		
Radium-228	1.8 pCi/g		

TABLE 2-3
ASCOC LIST FOR ALL A1PII-S3 UTILITY TRENCH CUs

ASCOC	FRL	Reason Retained
Total Uranium	82 mg/kg	Retained as a primary ASCOC sitewide
Radium-226	1.7 pCi/g	Retained as a primary ASCOC sitewide
Radium-228	1.8 pCi/g	Retained as a primary ASCOC sitewide
Thorium-228	1.7 pCi/g	Retained as a primary ASCOC sitewide
Thorium-232	1.5 pCi/g	Retained as a primary ASCOC sitewide
Technetium-99	30.0 pCi/g	Retained as a primary ASCOC due to previous detected results in the area.
Beryllium	1.5 mg/kg	Retained as a secondary ASCOC due to previous detected results in the area.

TABLE 2-4
ASCOC LIST FOR ALL CUs WEST OF FORMER NAR

ASCOC	FRL	Reason Retained
Total Uranium	82 mg/kg	Retained as a primary ASCOC sitewide
Radium-226	1.7 pCi/g	Retained as a primary ASCOC sitewide
Radium-228	1.8 pCi/g	Retained as a primary ASCOC sitewide
Thorium-228	1.7 pCi/g	Retained as a primary ASCOC sitewide
Thorium-232	1.5 pCi/g	Retained as a primary ASCOC sitewide
Arsenic	12 mg/kg	Retained as a secondary ASCOC
Lead	400 mg/kg	Retained as a secondary and ecological ASCOC

TABLE 2-5
ASCOC LIST FOR ALL CUs IN CHARACTERIZE FOR REUSE AREAS, TRAP RANGE, SECTOR 2 EAST OF FORMER NAR

ASCOC	FRL	Reason Retained
Total Uranium	82 mg/kg (20 mg/kg for CU A1P2-S3DP-01)	Retained as a primary ASCOC sitewide
Radium-226	1.7 pCi/g	Retained as a primary ASCOC sitewide
Radium-228	1.8 pCi/g	Retained as a primary ASCOC sitewide
Thorium-228	1.7 pCi/g	Retained as a primary ASCOC sitewide
Thorium-232	1.5 pCi/g	Retained as a primary ASCOC sitewide
Arsenic	12 mg/kg	Retained as a secondary ASCOC
Lead	400 mg/kg	Retained as a secondary and ecological ASCOC

TABLE 2-6
ASCOC LIST FOR SPECIFIC CUs EAST OF FORMER NAR

ASCOC	FRL	Reason Retained
Antimony	10 mg/kg (BTV value)	Retained as a ecological COC due to process knowledge
Beryllium	1.5 mg/kg	Retained as a secondary COC due to process knowledge
Technetium-99	30 pCi/g	Predesign analytical results
Tetrachloroethene also called Perchloroethylene (PCE)	3.6 mg/kg	Retained as a secondary ASCOC due to process knowledge
Aroclor 1254	0.13 mg/kg	Retained as a secondary ASCOC due to process knowledge near the incinerator
Aroclor 1260	0.13 mg/kg	Retained as a secondary ASCOC due to process knowledge near the incinerator
Molybdenum	10 mg/kg (BTV value)	Retained as an ecological COC

BTV – Benchmark Toxicity Value

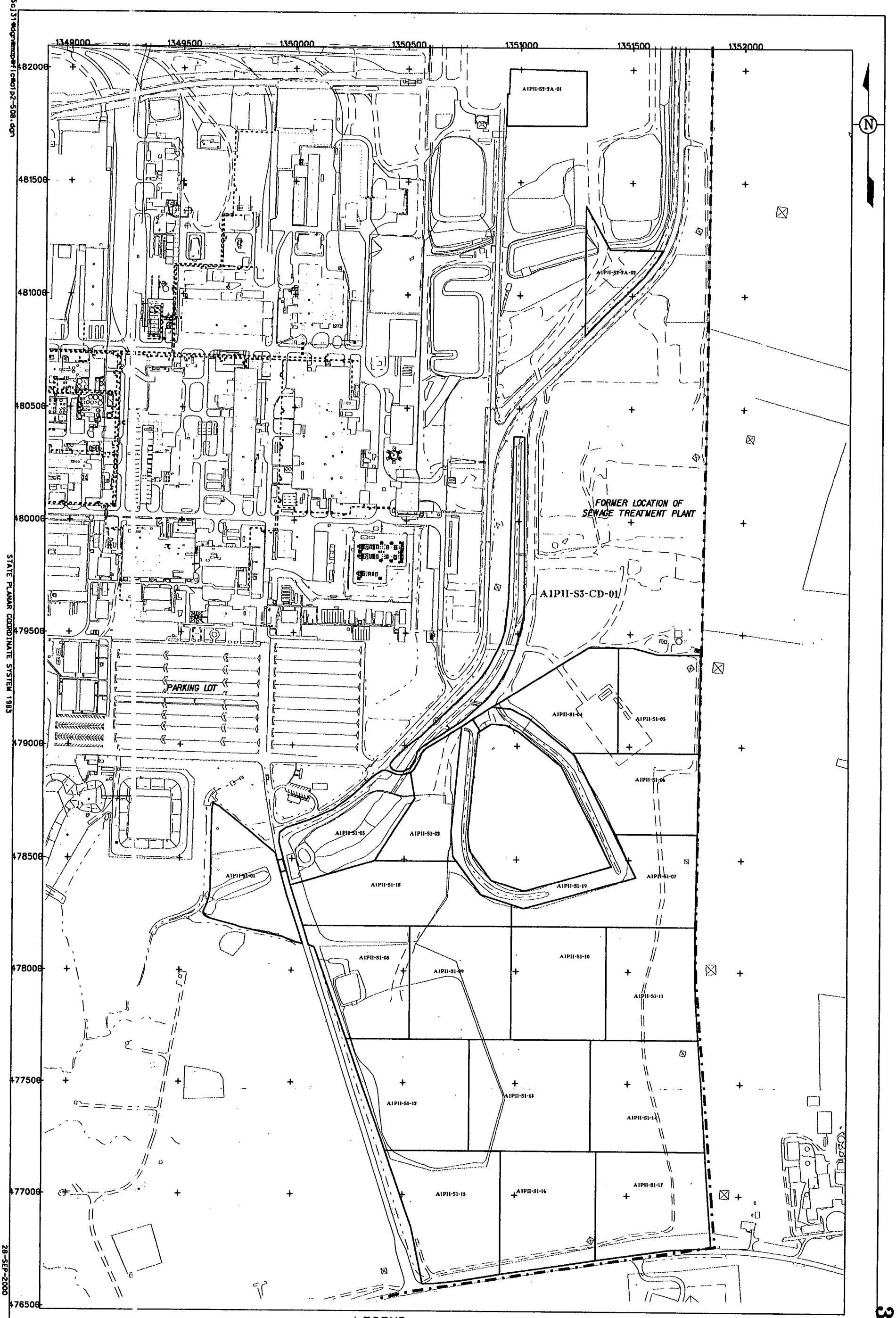

FIGURE 2-1. A1PII CERTIFICATION DESIGN FOR SECTOR 1, SECTOR 2A, AND CONVEYANCE DITCH

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28-SEP-2000
000032
3266

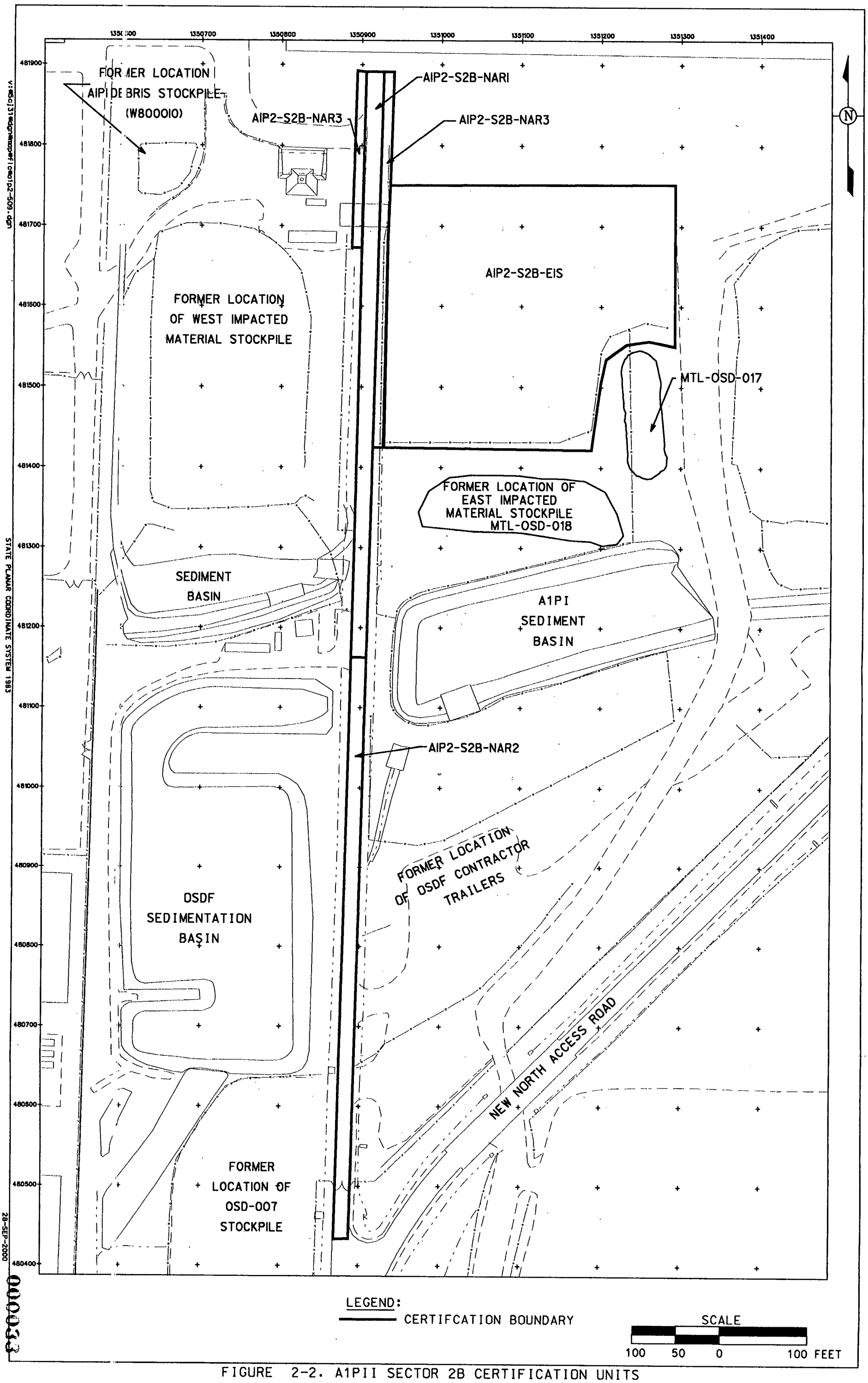

FIGURE 2-2. A1PII SECTOR 2B CERTIFICATION UNITS

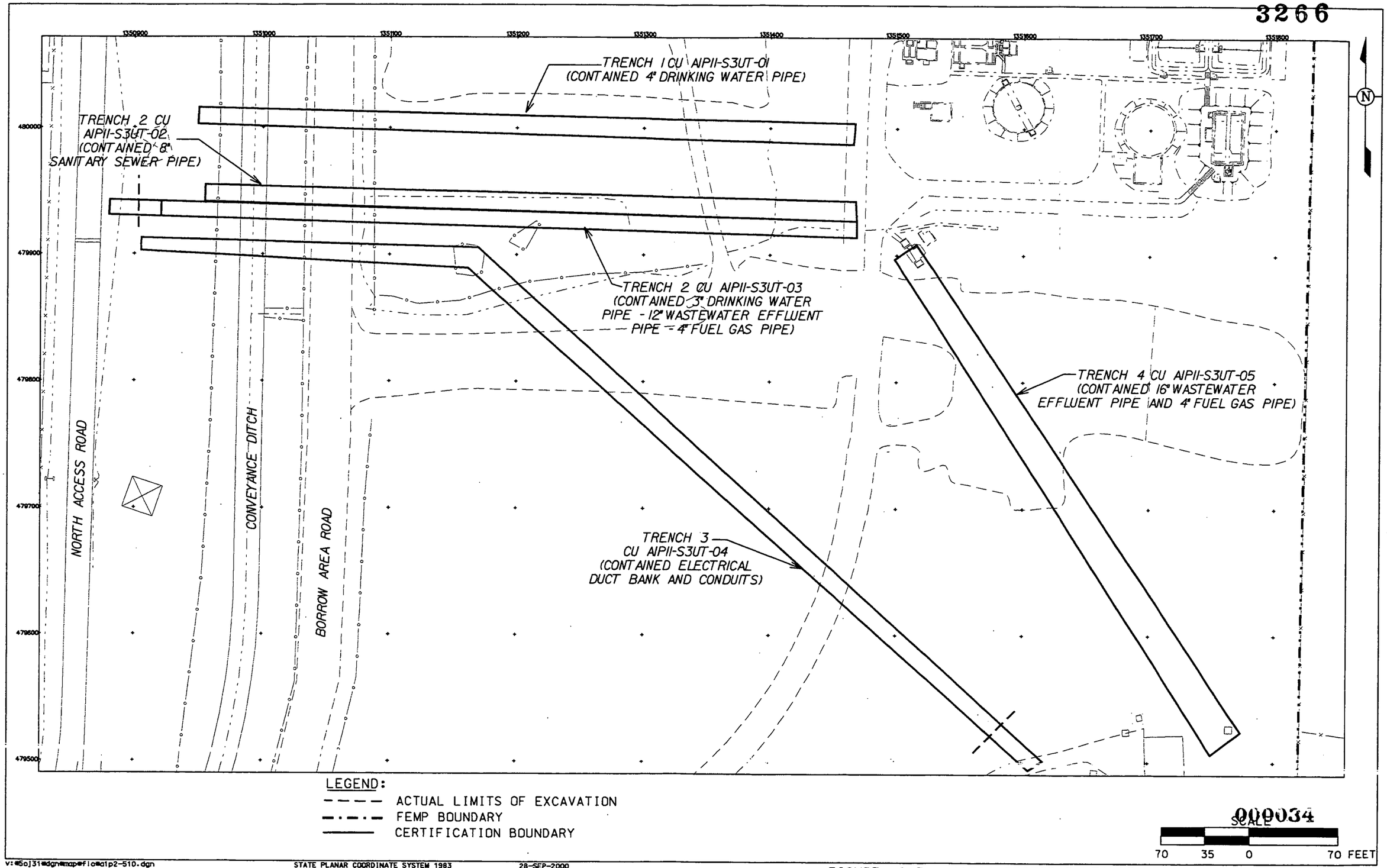

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FIGURE 2-3. A1PII SECTOR 3 UTILITY TRENCH CERTIFICATION UNITS

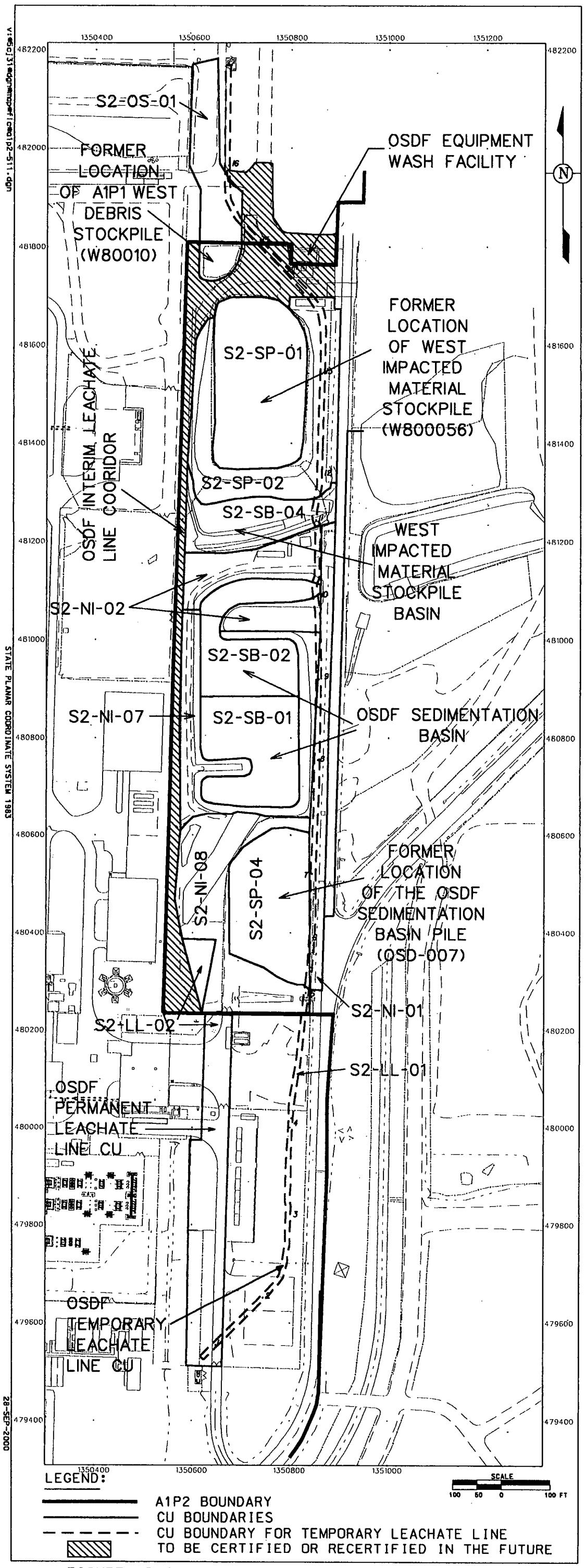

FIGURE 2-4. A1PII SECTOR 2 CERTIFICATION UNITS WEST OF THE NORTH ACCESS ROAD

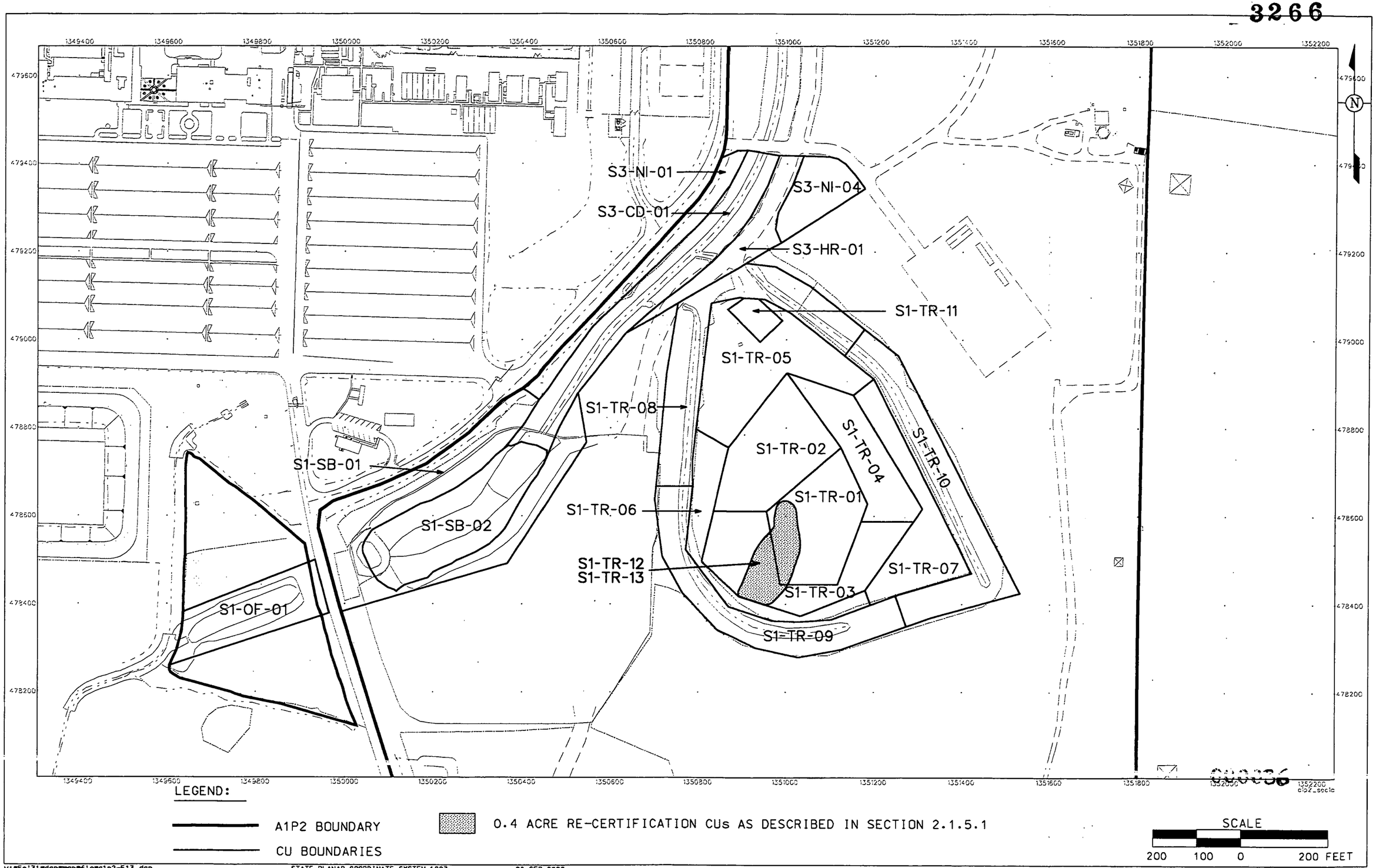

FIGURE 2-5. A1PII SECTOR 1 CU BOUNDARIES

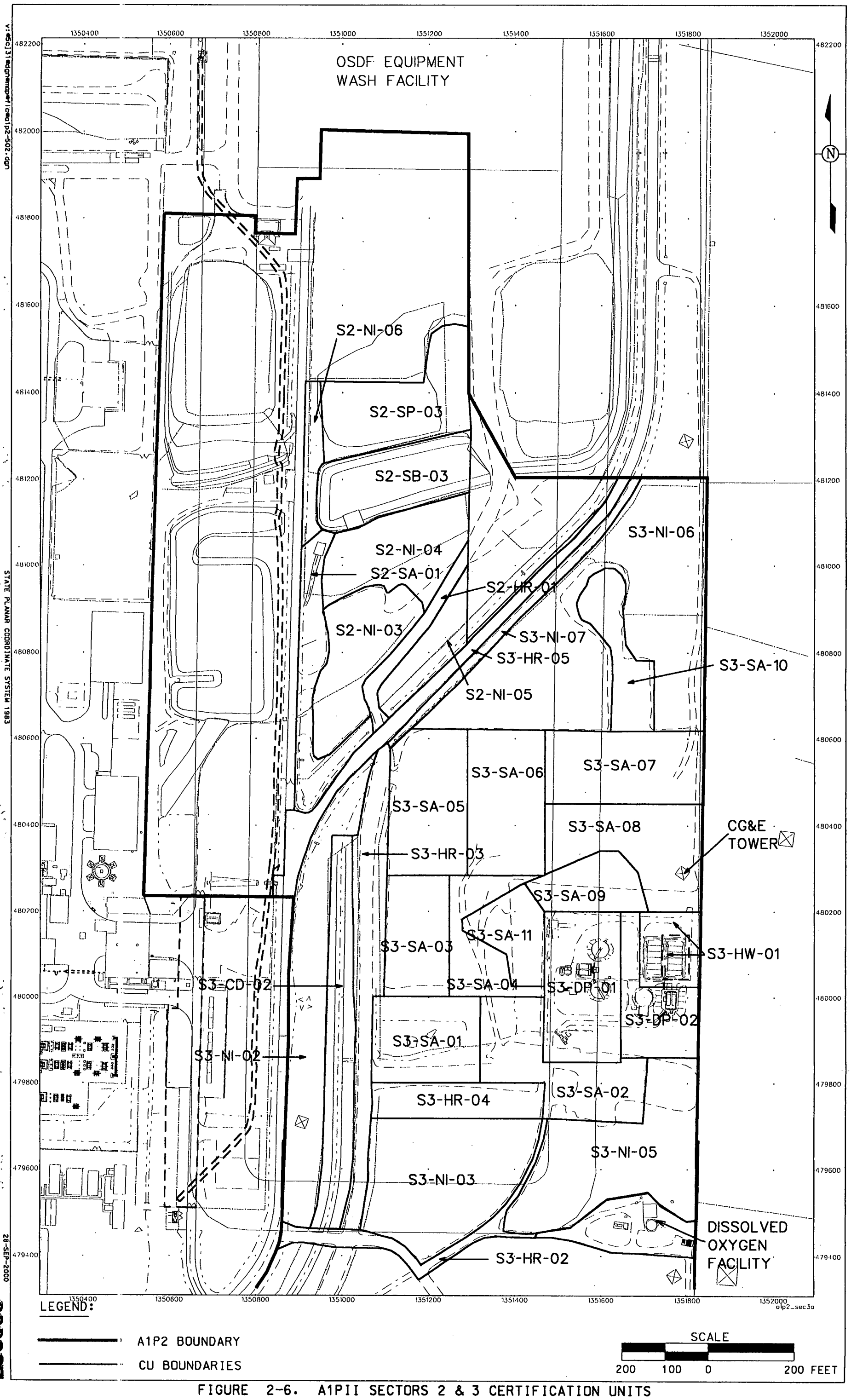

FIGURE 2-6. A1PII SECTORS 2 & 3 CERTIFICATION UNITS

3.0 OVERVIEW OF FIELD ACTIVITIES

This section is limited to information not presented in previous certification reports. The section specifically presents information related to the CUs east of the NAR as discussed in the CDL Certification Sampling of A1PII Certified for Reuse Areas, Trap Range, Sector 2C, and Sector 3 (DOE 2000b) and the A1PII Utility Trench CUs (DOE 1999c).

3.1 EXCAVATION ACTIVITIES

The field activities in A1PII were performed over a period of several years, with the majority of remedial actions occurring in fiscal year 1999. A brief chronology of the remedial activities is provided below.

- Fall 1998 - Site preparation work, including construction of the Conveyance Ditch, sediment basins, and other stormwater control activities
- June 1999 - Below grade excavation activities began in the STP area, including removal of the Digester Sludge, above-WAC technetium-99 areas, and "F" listed waste from the Sludge Drying Beds HWMU
- July 1999 - Below grade excavation in STP continued; Trap Range stabilization and excavation began
- August 1999 - STP deep excavation continued, and 6-inch stripping of surrounding areas began. Utility trench excavations and stockpile removals began
- September 1999 - Major excavations were completed by September 1999
- June 2000 - Additional 6 inches excavated within the 0.4-acre portion of the Trap Range (to become CU A1P2-S1TR-12) due to failure of CU A1P2-S1TR-01 and -03 which included a 15-foot by 30-foot by 3-inch deep area that underwent stabilization treatments
- August 2000 - Additional 18 inches excavated within the 0.4-acre portion of the Trap Range due to failure of CU A1P2-S1TR-12.

Table 3-1 summarizes the major excavation activities, the quantities, and the final disposition. A more detailed description of remedial actions can be found in the A1PII Integrated Remedial Design Package (DOE 1998e) and Supplemental Characterization Package (DOE 1999b).

3.1.1 CUs East of Former NAR

As discussed in the PSP for Certification Sampling of A1PII Certified for Reuse Areas, Trap Range, Sector 2C, and Sector 3 (DOE 2000c), sample locations were generated by dividing each CU into 16 approximately equal sub-CUs, then randomly selecting northing and easting coordinates within each sub-CU boundary. Twelve certification samples were collected at randomly selected locations, and the remaining four locations were to be used as alternates in the event that surface or subsurface obstacles prevented sample collection at any of the original locations. All samples were collected at 0 to 6-inch depths the in native soil. The only exceptions to the original plan (as stated above) were:

- CU A1P2-S3HW-01 - This CU encompassed the footprint of the sludge drying beds, HWMU 41. A total of 16 samples were collected and analyzed in this CU, with eight sample points located within the footprint of the HWMU area.

- CUs A1P2-S3SA-08 - A Cincinnati Gas and Electric Company (CG&E) tower is located in this CU in the 6-inch stripping area. The area under the tower was not accessible for stripping. As agreed verbally with OEPA, two additional samples were easily collected to ensure that the area met the FRL. The results of the two additional samples were not used to determine if the CU passed the statistical criteria for CU pass/fail conditions, but to determine if additional excavation was needed. The results of these samples did show above-FRL conditions, as discussed further in Sections 3.2.1 and 5.0.

- CUs A1P2-S2HR-01, A1P2-S3HR-01, A1P2-S3HR-02, and A1P2-S3HR-03 - These CUs contained sections of various haul or access roadways. Samples were collected in the top 6 inches of undisturbed, native soil beneath the roads and any subgrade materials or disturbed support materials.

- CUs A1P2-S3SA-09 and A1P2-S3SA-11 - During RA14, spot excavations were performed in locations within these CUs, which removed between 6 and 18 inches of soil. The RA14 Contaminated Soils Adjacent to the STP Incinerator Final Report (DOE 1994) notes that the off-property excavations were backfilled; however, the on-property excavation areas were not backfilled. Additionally, another 6 inches of soil was removed from these areas during STP remediation activities. Precertification real-time scanning, as well as additional analyses of physical samples, show no areas which exceed the FRL. Samples were collected and analyzed at two intervals (0 to 6 inches and 6 to 12 inches) in all 16 locations for these CUs. Statistical analyses of the analytical data will be performed for each depth interval separately. Certification results show below-FRL conditions in these areas.

- CU A1P2-S3HR-05 - This CU contains a section of the NAR. Prior to the onset of roadway construction, samples were collected from the top 6-inch interval of undisturbed soil. This 6-inch interval was stripped and the excavated soil was placed in stockpile NAR-007. Analytical results of the excavated soil were below FRL as reported in the Area 1 Stockpile Inventory and WAC Attainment Report (DOE 1998f). The roadway base was constructed using cut and fill excavation and no foreign fill material

was required. Certification samples were collected in the top 6-inch interval of soil directly beneath the pavement and gravel sub-base.

3.1.2 Utility Trench CUs

As discussed in the A1PII Sector 3 Utility Trenches Certification Sampling PSP (DOE 1999e), sampling occurred during the excavation of trenches and the removal of the utilities. Section 4.0 of the A1PII Supplemental Characterization Package (DOE 1999b) discusses the process for the removal of the utilities and the disposition of the material excavated. Once the pipe and bedding material was removed, the trench was over-excavated at the designated sample locations, and soil was placed adjacent to the trench. The soil material was then scanned using real-time instrumentation, specifically using HPGe detectors.

3.2 CHANGES TO SCOPE OF WORK

3.2.1 CUs East of Former NAR

The scope of work for certification sampling was performed as documented in the CDL and PSP, and there were no major changes during field implementation. Final certification sampling locations and CU boundaries remained as identified, and all analyses were carried out as planned. The primary changes to the planned scope of work resulted from stormwater management and CU sampling results.

Water that had accumulated in these CUs had to be pumped out prior to sampling: A1P2-S3DP-01, A1P2-S3DP-02, A1P2-S3HW-01, A1P2-S1TR-01, A1P2-S1TR-02, A1P2-S1TR-03, A1P2-S1TR-04, and A1P2-S1SB-02. Prior to pumping, several water samples were collected to ensure that the water was pumped to the appropriate locations. Water samples were collected from the following locations: Sludge Drying Bed (A1PI-S3HW-01), Incinerator Area (A1P2-S3DP-01), and Sediment Basin (A1P2-S1SB-02). Water from the Trap Range CUs did not require sampling. The sample results indicated total uranium concentration from the Sludge Drying Beds of 37 mg/kg, which is above the limit for stormwater discharge for the water. As a result, the water from A1P2-S3DP-01 was pumped via transfer line to the Advanced Wastewater Treatment Facility (AWWT) for treatment, and the water from A1P2-S3DP-02 was pumped to the conveyance channel. Water from A1P2-S3HW-01 drained into A1P2-S3DP-02, and all 16 samples were collected. Once the A1P2-S3DP-02 CU was dry, all 16 samples were collected and the remaining water from A1P2-S3DP-01 was diverted into this area. Once A1P2-S3DP-01 was dry, all 16 samples were collected. Once the CUs were dry, field conditions were evaluated to determine if sediment samples were required. Significant sediment had accumulated

at the following locations and sediment samples were collected: A1P2-S3DP-01-09, -12, -15 and A1P2-S3DP-02-10. The certification sample was collected from the top 6 inches of native, undisturbed soil beneath the sediment. Both sample results were used in the statistical analysis for the CU as presented in Appendix A. The same approach was used for CU A1P2-S1SB-02. The CU was pumped dry and sediment samples were collected at the following locations: A1P2-S3SB-02-01, -04, -10, and -15.

The following additional actions were taken in the following CUs as a result of initial sampling results:

- CU A1P2-S3SA-08 – One of the two additional samples under the CG&E tower was above the FRL for radium-226. As a result, the area was stripped 6 inches, and the stripped soil (A1P2-S3SA-08-CG1-RM) was dispositioned in the OSDF. Two additional samples were taken from the post-excavation area and the results were below FRL for radium-226 (1.56 and 1.08 pCi/g).

- CU A1P2-S2NI-05 – Statistical analysis of the original 12 certification samples showed a failure for thorium-232 for the *a posteriori* sample size. The additional archive samples were collected, analyzed, and included in the statistical analysis.

- CU A1P2-S1TR-01 – Statistical analysis of the original 12 samples showed a failure for arsenic. Analysis of the additional four archive samples showed above-FRL and hot spot conditions in the CU. After evaluating the results from this and adjacent CUs, samples were collected at depths (0 to 6 inches, 6 to 12 inches, 12 to 18 inches) at the location with the highest result (A1P2-S1TR-01-09). Lead stabilization of a 15-foot by 30-foot by 3-inch deep area followed by a 6-inch excavation within a portion of the CU was completed to remediate the CU failure.

- CU A1P2-S1TR-03 – Statistical analysis of the 12 samples showed a failure for the arsenic ASCOC. A 6-inch excavation within a portion of the CU was completed to remediate the CU failure.

- CU A1P2-S1TR-12 - This CU was added to certify the footprint of the 0.4-acre, 6-inch excavation designed to address the certification failure for CU A1P2-S1TR-01 and -03.

- CU A1P2-S1TR-13 - This CU was added to certify the footprint of the 0.4-acre, 18-inch excavation designed to address the certification failure for CU A1P2-S1TR-12.

The only other activities that were outside the planned scope of work were the discovery of some contaminated debris in STP, and the removal of the CG&E tower legs adjacent to the NAR in CU A1P2-S3NI-02.

During a walk-through of the STP excavation site, four pipe fragments were discovered in the area. Radiological survey of the fragments showed fixed contamination with the highest reading of 75,000 disintegrations per minute/100 cm^2. The fragments were removed and upon closer visual inspection of the area, additional pipe fragments were found and removed.

Part of the remedial action in A1PII included the removal of the remaining CG&E tower legs and spillage pads adjacent to the NAR. During removal of the legs and spillage pads, fixed contamination was found on one of the legs of the tower. Once the leg was removed, some additional soil was removed around the leg, and an HPGe scan was performed to confirm below-FRL conditions.

3.2.2 Utility Trench CUs

The primary change to the original scope was the sequence and method of collection activities. The samples were collected by five different processes as summarized below:

1. Certification sample collected from a stockpile and an HPGe measurement taken
   The following locations had certification samples collected from a temporary stockpile and HPGe measurement was performed:

   - A1PII-S3UT-01-06 through A1PII-S3UT-01-12
   - A1PII-S3UT-02-05 through A1PII-S3UT-02-13

   This approach is consistent with original approach as discussed in the PSP.

2. Certification sample collected from the bucket and an HPGe measurement taken
   The following locations had certification samples collected from the bucket of the trackhoe and an HPGe measurement was performed:

   - A1PII-S3UT-01-01 through A1PII-S3UT-01-03, and A1PII-S3UT-01-13 through A1PII-S3UT-01-14
   - A1PII-S3UT-02-01 through A1PII-S3UT-02-03, and A1PII-S3UT-02-14
   - A1PII-S3UT-03-07 through A1PII-S3UT-01-15
   - A1PII-S3UT-05-10 through A1PII-S3UT-05-16

3. Certification samples collected by Geoprobe
The following locations were collected by using a Geoprobe without an HPGe measurement:

- A1PII-S3UT-01-04 through A1PII-S3UT-01-05 and A1PII-S3UT-01-15 through A1PII-S3UT-01-16
- A1PII-S3UT-02-04 and A1PII-S3UT-02-15 through A1PII-S3UT-02-16
- A1PII-S3UT-03-01 and A1PII-S3UT-03-16
- A1PII-S3UT-04-16

4. Certification samples collected from the bucket without an HPGe measurement
At the following locations the certification sample was collected from the bucket, but an HPGe measurement was not performed:

- A1PII-S3UT-03-02 through A1PII-S3UT-03-06
- A1PII-S3UT-04-01 through A1PII-S3UT-04-15
- A1PII-S3UT-05-03 through A1PII-S3UT-05-09

5. Certification samples collected *in situ* without HPGe measurement
At the following locations certification samples were collected *in situ* since the excavation trench is shallow enough to allow safe access by sampling personnel:

- A1PII-S3UT-05-01 and A1PII-S3UT-05-02.

TABLE 3-1
EXCAVATION QUANTITIES AND DISPOSITION

Description	Certification Unit(s)	Estimated Bank Cubic Yards	Actual Bank Cubic Yards	Final Disposition
Stockpile NAR-007	A1P2-S3SA-10	2,740	3,026	OSDF
Stockpile OSD-007	A1P2-S2SP-04	6,300	9,203	OSDF
6-inch Stripping	A1P2-S2SA-01, A1P2-S3SA-01 through 10	8,500	8,500	OSDF
Above-WAC Material	A1P2-S3DP-01, A1P2-S3DP-02, A1P2S3HW-01	788	2,458	SP-7
Oil Saturated Soil	A1P2-S3DP-02	30	30	OSDF
Digester Sludge	A1P2-S3DP-02, A1P2-S3HW-01	650	2,758	SP-7
"F" Listed Sludge Cake	A1P2-S3HW-01	35	120	Envirocare
Utility Excavation Within STP Limits (Meeting WAC)	A1P2-S3DP-01, A1P2-S3DP-02, A1P2S3HW-01	50	500	OSDF
Process Utility Excavation, Above-WAC	A1P2-S3UT-02	210	210	SP-7
Impacted Pipe Bedding Material	A1P2-S3UT-01, and A1P2-S3UT-02 through 05	690	690	OSDF
Above-WAC Pipe Bedding Material	A1P2-S3UT-02	100	100	SP-7
STP Deep Soil Excavation	A1P2-S3DP-01, A1P2-S3DP-02, A1P2S3HW-01	24,600	22,902	OSDF
Concrete and Structure Debris - STP Deep	A1P2-S3DP-01, A1P2-S3DP-02, A1P2S3HW-02	2,000	4,351	OSDF
Stabilized Trap Range Contaminated Soil	A1P2-S1TR-01 through 07	6,245	5,922	OSDF
Additional FRL at Old OSDF Contractor Support Area	A1P2-S2SA-01	133	133	OSDF
STP Haul Road	A1P2-S3SA-04	550	550	OSDF
Additional 0.4 acre excavation in Trap Range	A1P2-S1TR-12 and 13	1,386	1,525	OSDF
Total Excavation Quantities			*62,978*	

3266

4.0 ANALYTICAL METHODOLOGIES, DATA VALIDATION PROCESSES AND DATA REDUCTION

4.1 ANALYTICAL METHODOLOGIES

A1PII samples were analyzed at FEMP approved laboratories per the Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ, DOE 1998b). To be on the FEMP Approved Laboratories List, a laboratory must comply with SCQ requirements and be audited within 1 year of sample analysis. The SCQ is also the source for analytical methodologies (Appendix G), data validation and verification, and analytical and field quality assurance/quality control (QA/QC) requirements.

For all certification data, analytical support level (ASL) D analytical requirements were selected per Appendix G of the SCQ. The laboratory reported an ASL D data package. For the total uranium data, the detection limit was set at 10 percent of the FRL (8.2 mg/kg), which is higher than the detection limit documented in Appendix G. Similarly, the detection limit was set at approximately 10 percent of the FRL (1.5 pCi/g) for thorium-228 and thorium-232, which is also higher than the detection limit documented in Appendix G. Therefore, by definition, the ASL detection limit for uranium, thorium-228 and thorium-232 is ASL E, although all other ASL D requirements are met for these analyses. The analytical data packages provided by the contract laboratory included sample results with associated QA/QC data and all applicable raw data.

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

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

Radium-226

Samples were analyzed by gamma 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 laboratory used the same gamma ray emission lines and error weighted average methodology to calculate all 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 certification results.

Isotopic Thorium

Isotopic thorium was also quantified by gamma spectrometry. The off-site laboratory used the same gamma ray emission lines and error weighted average methodology to calculate all certification results.

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 EPA's National Functional Guidelines for Data Review (Inorganic Data, EPA 1994), as adapted and approved by EPA Region V, was used for this process.

Specific parameters associated with the data were evaluated during V&V to determine whether the data quality objectives were met. Five principal quality assurance parameters (i.e., precision, accuracy, completeness, comparability, and representativeness) were addressed during V&V. Field sampling and handling, laboratory analysis and reporting, and nonconformances 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 that apply to all the chemical data include the following:

- Holding Times
- Instrument calibrations
- Calculation of results
- Matrix spike/matrix spike duplicate recoveries
- Laboratory/field duplicate precision
- Field/Laboratory Blank contamination
- Dry weight correction for solid samples
- Correct detection limits reported
- Laboratory control sample (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
- Tracer yields
- 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 of ten percent of the certification data were validated to validation level D. This validation included the same review process as for ASL B, but included a systematic review of the raw data and recalculations.

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

- No qualification; the positive result or detection limit is confident as reported

J Positive result is estimated or imprecise; data point is usable for decision-making purposes. Positive results less than the contract required reporting limit are also qualified in this manner

R Positive result or detection limit is considered unreliable - data point should NOT be used for decision-making purposes

U Undetected result at the stated limit of detection

UJ Undetected result; detection limit is considered estimated or imprecise; the data point is usable for decision-making purposes

N Positive result is tentatively identified - that is, there is some question regarding the actual identification and quantification of the result. Compound reported is best professional judgement of the interpretation of the supporting data, such as mass spectra. Caution must be exercised with the use of this data

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 useable result.

The V&V of this data set did not identify any significant problems with the data set.

4.3 DATA REDUCTION

Each sample used to support the certification decision was entered in the FEMP 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 location.

Laboratory Information

For each sample result, the following information was entered:

- Laboratory Result - The reported analytical value from the laboratory

- Laboratory Qualifier - The qualifier reported from the lab. For radiological parameters non-detect values are assigned a U qualifier

- Total Propagated Uncertainty (TPU) - This value represents the uncertainty associated with the reported result. TPU includes the counting error, as well as uncertainty from other laboratory measurements and data reduction. (Applicable to radiological parameters only)

- Units - The units in which the laboratory result is reported.

Validation Information

- Validation Result - The result is 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 the 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 was used in the statistical calculations.

5.0 CERTIFICATION EVALUATION AND CONCLUSIONS

Certification success or failure was based on a review of certification sample data from each CU against criteria discussed in Section 2.0. All CUs were evaluated against these criteria and the final certification statistics are presented in Appendix A.

5.1 CERTIFICATION RESULTS AND EVALUATION

5.1.1 Certification Results for A1PII Sector 1, Sector 2A, and Conveyance Ditch

All 22 CUs for A1PII Sector 1, 2A and the Conveyance Ditch passed the certification criteria. The determination of successful certification or certification failure was based on a review of certification sample data from each CU against criteria discussed in Section 2.0. All CUs in A1PII passed final certification relative to the average concentration of COCs and the "hot spot" determination. All CUs passed on the first round of certification, and no additional corrective actions were necessary. Final certification data are presented in Appendix A.

5.1.2 Certification Design for A1PII Sector 2B

All four CUs for A1PII-2SB passed the certification criteria. Certification success or failure was based on a review of certification sample data from each CU against criteria discussed in Section 2.2.5. All CUs passed final certification relative to the average COC concentration and the two times FRL "hot spot" criterion. All CUs passed on the first round of certification, and no additional corrective actions were necessary. Final certification data are presented in Appendix A. A review of the certification results reveals that no sample result exceeded the FRL.

5.1.3 Certification Design for A1PII Sector 3 Utility Trenches

All five CUs for A1PII-S3UT passed the certification criteria. Certification success or failure was based on a review of certification sample data from each CU against criteria discussed in Section 2.2.5. All CUs passed final certification relative to the average COC concentration and the two times FRL "hot spot" criterion. All CUs passed on the first round of certification, and no additional corrective actions were necessary. Final certification data are presented in Appendix A. A review of the certification results reveals that no sample result exceeded the FRL.

5.1.4 Certification Design for A1PII Sector 2 CUs West of Former NAR

All 13 CUs passed the certification criteria. Certification success or failure was based on a review of certification sample data from each CU against criteria discussed in Section 2.2.5. All CUs passed final certification relative to the average COC concentration and the two times FRL "hot spot" criterion. All CUs passed on the first round of certification except CU A1PII-S2SB-01. This CU passed the average UCL and "hot spot" criteria, but failed the *a posteriori* sample size calculation for arsenic. The additional four archive samples were collected and submitted for analysis. With the additional four samples, the CU passed all certification criteria, and no additional corrective actions were required. Final certification data are presented in Appendix A.

5.1.5 Certification Design for A1PII Characterize for Reuse Areas, Trap Range, Sector 2 CUs East of Former NAR, and Sector 3

All of the initial CUs passed the certification criteria except CUs A1P2-S1TR-01 and A1P2-1TR-03. For CU A1P2-S1TR-01, statistical analyses of the original 12 samples a failure for arsenic. In addition, sample location -09 also failed the 2xFRL rule for lead. For CU A1P2-S1TR-03, the CU failed the UCL and the *a posteriori* test for arsenic.

As presented earlier, a contiguous 0.4-acre remediation area (Figure 5-1) was designed to encompass sample location -09 and the other above-FRL sample locations for arsenic and lead within these two CUs. In order to delineate the vertical extent of contamination, samples were taken at depth (6 to 12 inches and 12 to 18 inches) at location 9. Results of the at-depth sampling indicated that contamination was expected to be limited to the top 6 inches. After the stabilization and 6-inch excavation in the 0.4-acre area, the CU for this footprint was sampled and analyzed (A1P2-S1TR-12). The results for the footprint passed certification for lead but failed for arsenic. At-depth sampling to determine vertical extent of the arsenic contamination was performed. Results indicated that below-FRL arsenic values could be reached within the top 18 inches. Thus, an additional 18-inches was excavated within the 0.4-acre area and the area re-sampled for certification (A1P2-S1TR-13). Results from this recertification attempt were successful as the 0.4-acre CU passed certification for arsenic.

All the other CUs passed final certification on the first round except for CUs A1P2-S2NI-05. For CU A1P2-S2NI-05, statistical analyses of the original 12 certification samples shows a failure for thorium-232 for the *a posteriori* sample size. The additional archive samples were collected, analyzed, and included in the statistical analyses. The CU subsequently passed. All areas in CU A1P2-S3SA-08

were stripped 6 inches during remediation activities except the area under the CG&E tower. The radium-226 result for one of the two additional samples collected under the CG&E tower was above-FRL and this area was subsequently stripped 6 inches. The results for certification samples collected in this CU show that 6-inch stripping was adequate for removal of above-FRL surface contamination. Therefore, the conditions for certification have been met for this CU.

5.2 SLUDGE DRYING BED HAZARDOUS WASTE MANAGEMENT UNIT CLOSURE

CU A1P2-S3HW-01, which represents the HWMU for the Sludge Drying Beds, has successfully passed the certification criteria as stated in Section 2.2.5. This HWMU is now considered closed under the integrated Resource Conservation and Recovery Act (RCRA)/CERCLA Director's Findings and Observations process. The DOE will remove posted signs/barriers, stop inspections, and remove this unit from the Part A permit application.

5.3 CERTIFICATION CONCLUSIONS AND FUTURE LAND USE

All of the A1PII area has passed certification statistical analyses relative to the determination of average residual soil concentrations within applicable confidence bounds of all the ASCOCs, and relative to the two times FRL "hot spot" criterion except those noted in Section 5.1.5. Based on these results, DOE has determined that the remedial objectives in the OU5 ROD have been achieved in A1PII, and no further remedial actions are required. A1PII will be released for final land use upon approval of the regulatory agencies. Note that DOE is planning the following activities in A1PII:

- The A1PII Sedimentation Basin located in Sector 1 will be extended south to accommodate additional drainage from the OSDF area
- DOE is planning not to extended the NAR through STP excavation area
- A portion of the former Trap Range area will be used to stockpile construction material. The planned area is north of the current CU failure.

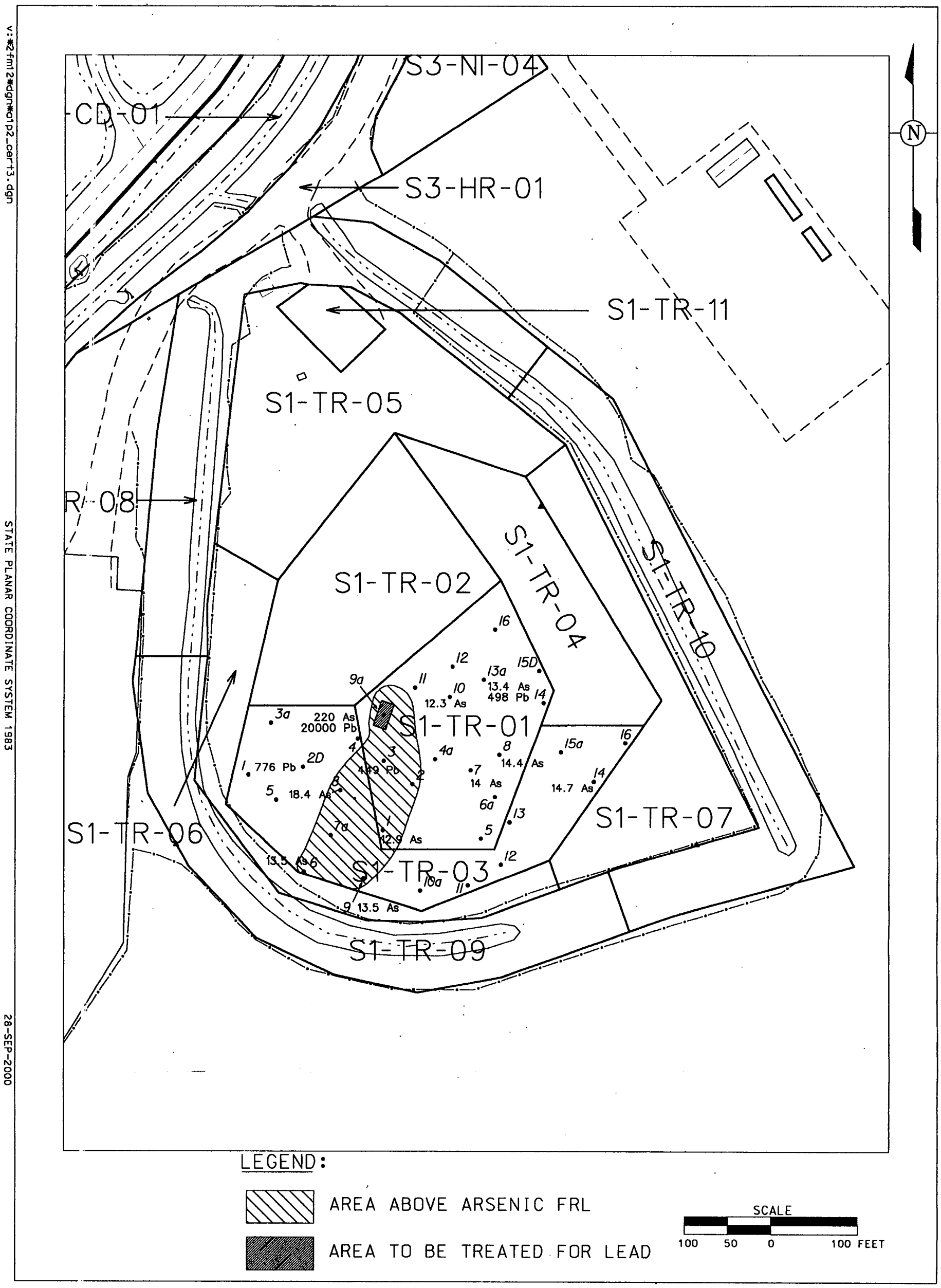

FIGURE 5-1. A1PII SECTOR 1 TRAP RANGE EXCAVATION

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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. FEMP procedure EP-0008 has been developed to implement a process to protect certified areas from becoming recontaminated.

The procedure is summarized as follows:

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

After DOE certifies the remediated area, it will be transferred for final land use. At that time, best management practices and administrative controls will be used to protect the area from contamination, and other controls will be implemented as needed.

REFERENCES

U.S. Department of Energy, 1994, "Removal Action 14 Contaminated Soils Adjacent to the Sewage Treatment Plan Incinerator Final Report," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1995, "Remedial Investigation Report for Operable Unit 5," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

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

U.S. Department of Energy, 1996b, "Remedial Design Work Plan for Remedial Actions at Operable Unit 5," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1997, "Certification Design Letter for Area 1, Phase II – Sectors 1," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1998a, "Certification Report for Area 1, Phase II Sector 1, 2A, and Conveyance Ditch," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1998b, "Sitewide CERCLA Quality Assurance Project Plan," Revision 1, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

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

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

U.S. Department of Energy, 1998e, "Area 1, Phase II Integrated Remedial Design Package," Draft Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1998f, "Area 1 Stockpile Inventory and Waste Acceptance Criteria Attainment Report," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1999a, "Certification Report for Area 1, Phase II Sector 2B," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1999b, "Area 1, Phase II Supplemental Characterization Package," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1999c, "Certification Design Letter for Area 1, Phase II Sector 2B," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1999d, "Certification Design Letter for Area 1, Phase II Sector 3 Utility Trenches," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 1999e, "Project Specific Plan for the Certification of Area 1, Phase II Utility Trenches," Revision 0, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 2000a, "Certification Report for Area 1, Phase II Sector 2 Certification Units West of the Former North Access Road," Draft, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

U.S. Department of Energy, 2000b, "Certification Design Letter for Area 1, Phase II Certified for Reuse Areas, Trap Range, Sector 2C, and Sector 3," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

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

U.S. Environmental Protection Agency, 1994, "National Functional Guidelines for Data Review," U.S. EPA Office of Solid Waste and Emergency Response, Washington, DC.

CERTIFICATION STATISTICS FROM THE CERTIFICATION DESIGN LETTER FOR AREA 1, PHASE II SECTORS 1, 2A, AND CONVEYANCE DITCH

CU A1PII-S1-01
CU A1PII-S1-02
CU A1PII-S1-03
CU A1PII-S1-04
CU A1PII-S1-05
CU A1PII-S1-06
CU A1PII-S1-07
CU A1PII-S1-08
CU A1PII-S1-09
CU A1PII-S1-10
CU A1PII-S1-11
CU A1PII-S1-12
CU A1PII-S1-13
CU A1PII-S1-14
CU A1PII-S1-15
CU A1PII-S1-16
CU A1PII-S1-17
CU A1PII-S1-18
CU A1PII-S1-19
CU A1PII-S3-CD-01
CU A1PII-S2-2A-01
CU A1PII-S2-2A-02

Table A-2 CU A1PII-S1-01 Summary Statistics without Stockpile Samples

Area 1 Phase II Certification Statistics (original 16 samples)

	RADIONUCLIDES					METALS
Station Number	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-S1-01-01	0.96 -	0.84 -	0.84 -	0.84 -	7.40 UJ	4.40 NV
A1PII-S1-01-01-D	0.93 -	0.81 -	0.79 -	0.81 -	2.70 UJ	3.70 NV
A1PII-S1-01-02	1.05 -	0.90 -	0.83 -	0.90 -	8.90 UJ	2.20 NV
A1PII-S1-01-03	1.00 -	0.81 -	0.79 -	0.81 -	2.60 UJ	4.60 NV
A1PII-S1-01-04	1.25 -	1.08 -	1.09 -	1.08 -	6.70 UJ	4.90 NV
A1PII-S1-01-05	1.33 -	1.08 -	1.08 -	1.08 -	7.29 -	3.30 NV
A1PII-S1-01-06	0.97 -	0.89 -	0.86 -	0.89 -	7.10 UJ	6.50 NV
A1PII-S1-01-07	0.99 -	0.86 -	0.87 -	0.86 -	6.40 UJ	3.60 NV
A1PII-S1-01-08	1.40 -	1.25 -	1.23 -	1.25 -	2.90 UJ	5.10 NV
A1PII-S1-01-09	0.98 -	1.00 -	0.97 -	1.00 -	6.10 UJ	4.70 NV
A1PII-S1-01-10	1.32 -	1.13 -	1.10 -	1.13 -	17.50 -	4.40 NV
A1PII-S1-01-11	1.11 -	1.04 -	1.01 -	1.04 -	15.60 -	3.80 NV
A1PII-S1-01-12	1.26 -	1.16 -	1.13 -	1.16 -	19.00 -	4.90 NV
A1PII-S1-01-13	0.86 -	0.72 -	0.69 -	0.72 -	5.90 UJ	6.60 NV
A1PII-S1-01-14	1.33 -	1.18 -	1.17 -	1.18 -	14.60 -	4.00 NV
A1PII-S1-01-15	1.23 -	1.25 -	1.25 -	1.25 -	7.32 -	3.00 NV
A1PII-S1-01-16	1.02 -	1.08 -	1.04 -	1.08 -	10.10 -	3.00 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	14.8% (LN)	52.9% (N)	64.1% (N)	52.9% (N)	not tested	70.9% (LN)
Test Procedure	t-Test (LN)	t-Test (N)	t-Test (N)	t-Test (N)	Proportions	t-Test (LN)
Sample Size	16	16	16	16	16	16
Est. Mean*	1.13	1.02	1.00	1.02	7.31 **	4.33
UCL	1.21	1.09	1.07	1.09	- -	4.80
Prob.	- -	- -	- -	- -	0.0%	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.40 -	1.25 -	1.25 -	1.25 -	19.00 -	6.60 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size calculation	3 Pass	2 Pass	2 Pass	3 Pass	3 Pass	2 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"

* - The median (Est. Mean) for Total Uranium is the average of the 10th and 11th ranked sample results. These two values are "7.29" (..-05) and "7.32" (..-15).
The maximum value of the two duplicates was used in all statistical equations.

#: This 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.

MDC Corrected

000057

Table A-2a CU A1PII-S1-01 Summary Statistics with Stockpile Samples

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-S1-01-01	0.96 -	0.84 -	0.84 -	0.84 -	7.40 UJ	4.40 NV
A1PII-S1-01-01-D	0.93 -	0.81 -	0.79 -	0.81 -	2.70 UJ	3.70 NV
A1PII-S1-01-02	1.05 -	0.90 -	0.83 -	0.90 -	8.90 UJ	2.20 NV
A1PII-S1-01-03	1.00 -	0.81 -	0.79 -	0.81 -	2.60 UJ	4.60 NV
A1PII-S1-01-04	1.25 -	1.08 -	1.09 -	1.08 -	6.70 UJ	4.90 NV
A1PII-S1-01-05	1.33 -	1.08 -	1.08 -	1.08 -	7.29 -	3.30 NV
A1PII-S1-01-06	0.97 -	0.89 -	0.86 -	0.89 -	7.10 UJ	6.50 NV
A1PII-S1-01-07	0.99 -	0.86 -	0.87 -	0.86 -	6.40 UJ	3.60 NV
A1PII-S1-01-08	1.40 -	1.25 -	1.23 -	1.25 -	2.90 UJ	5.10 NV
A1PII-S1-01-09	0.98 -	1.00 -	0.97 -	1.00 -	6.10 UJ	4.70 NV
A1PII-S1-01-10	1.32 -	1.13 -	1.10 -	1.13 -	17.50 -	4.40 NV
A1PII-S1-01-11	1.11 -	1.04 -	1.01 -	1.04 -	15.60 -	3.80 NV
A1PII-S1-01-12	1.26 -	1.16 -	1.13 -	1.16 -	19.00 -	4.90 NV
A1PII-S1-01-13	0.86 -	0.72 -	0.69 -	0.72 -	5.90 UJ	6.60 NV
A1PII-S1-01-14	1.33 -	1.18 -	1.17 -	1.18 -	14.60 -	4.00 NV
A1PII-S1-01-15	1.23 -	1.25 -	1.25 -	1.25 -	7.32 -	3.00 NV
A1PII-S1-01-16	1.02 -	1.08 -	1.04 -	1.08 -	10.10 -	3.00 NV
A1PII-S1-01-17	0.88 -	0.76 -	0.75 -	0.76 -	5.30 UJ	2.00 NV
A1PII-S1-01-18	1.13 -	0.94 -	0.92 -	0.94 -	11.20 -	2.30 NV
A1PII-S1-01-19	0.96 -	0.77 -	0.75 -	0.77 -	6.20 UJ	3.50 NV
A1PII-S1-01-20	0.96 -	0.82 -	0.80 -	0.82 -	5.90 UJ	3.40 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	9.7% (LN)	33.7% (LN)	43.6% (LN)	33.7% (LN)	not tested	61.8% (LN)
Test Procedure	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (LN)	Proportions	t-Test (LN)
Sample Size	20	20	20	20	20	20
Est. Mean*	1.10	0.98	0.96	0.98	7.31 **	4.03
UCL	1.17	1.05	1.03	1.05	- -	4.48
Prob.	- -	- -	- -	- -	0.0%	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.40 -	1.25 -	1.25 -	1.25 -	19.00 -	6.60 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size calculation	3 Pass	2 Pass	2 Pass	3 Pass	3 Pass	2 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"

** - The median (Est. Mean) for Total Uranium is the average of the 10th and 11th ranked sample results. These two values are "7.29" (..-05) and "7.32" (..-15).

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

#: This 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.

MDC Corrected

000058

Table A-3 CU A1PII-S1-02 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1PII-S1-02-01	1.40 J	1.20 -	1.20 -	1.20 -	13.96 J	3.90 NV	18.70 NV
A1PII-S1-02-02	1.30 J	1.10 -	1.10 -	1.10 -	14.27 J	6.90 NV	22.50 NV
A1PII-S1-02-02-D	1.40 J	1.10 -	1.10 -	1.10 -	7.80 J	7.70 NV	24.00 NV
A1PII-S1-02-03	1.20 J	0.87 -	0.84 -	0.87 -	14.29 J	7.20 NV	21.00 NV
A1PII-S1-02-04	1.30 J	1.10 -	1.20 -	1.10 -	6.20 J	5.30 NV	17.10 NV
A1PII-S1-02-05	1.20 J	1.10 -	1.10 -	1.10 -	16.40 J	5.40 NV	21.30 NV
A1PII-S1-02-06	1.10 J	1.10 -	1.10 -	1.10 -	14.75 J	5.30 NV	16.20 NV
A1PII-S1-02-07	1.10 J	1.20 -	1.20 -	1.20 -	6.30 J	5.90 NV	26.90 NV
A1PII-S1-02-08	1.10 J	1.00 -	1.00 -	1.00 -	10.39 J	5.20 NV	26.60 NV
A1PII-S1-02-09	1.20 J	0.98 -	1.10 -	0.98 -	16.50 J	5.30 NV	16.90 NV
A1PII-S1-02-10	1.10 J	1.00 -	1.10 -	1.00 -	26.62 J	4.60 NV	15.90 NV
A1PII-S1-02-11	1.10 J	1.00 -	1.00 -	1.00 -	8.00 J	4.90 NV	15.70 NV
A1PII-S1-02-12	1.10 J	0.86 -	0.87 -	0.86 -	6.60 J	8.70 NV	15.40 NV
A1PII-S1-02-13	1.40 J	1.30 -	1.40 -	1.30 -	2.90 J	9.30 NV	16.00 NV
A1PII-S1-02-14	1.10 J	0.98 -	1.00 -	0.98 -	5.40 J	8.40 NV	23.00 NV
A1PII-S1-02-15	1.20 J	1.10 -	1.10 -	1.10 -	10.38 J	6.90 NV	13.70 NV
A1PII-S1-02-16	1.10 J	0.98 -	0.99 -	0.98 -	3.30 J	10.60 NV	18.90 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
W-statistic Prob. #	0.1% (LN)	39.0% (LN)	29.3% (LN)	39.0% (LN)	47.0% (LN)	47.9% (LN)	26.2% (LN)
Test Procedure	Wilcoxon	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (LN)
Sample Size	16	16	16	16	16	16	16
Est. Mean*	1.15 **	1.05	1.08	1.05	11.32	6.55	19.22
UCL	- -	1.11	1.15	1.11	16.02	7.26	20.68
Prob.	0.019%	- -	- -	- -	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.40 J	1.30 -	1.40 -	1.30 -	26.62 J	10.60 NV	26.90 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -	- -
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	2 Pass	2 Pass	2 Pass	1 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
'** - The median (Est. Mean) for Radium-226 is the average of the 8th and 9th ranked sample results. These two values are "1.2 J" (..-03) and "1 1 J" (..-06). The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

MDC Corrected

3266

000059

Table A-4 CU A1PII-S1-03 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-S1-03-01	1.28 -	1.06 J	1.08 J	1.06 J	14.30 J	7.30 NV
A1PII-S1-03-02	1.17 -	1.02 J	1.09 J	1.02 J	12.73 J	5.60 NV
A1PII-S1-03-03**	0.47 -	0.29 J	0.30 J	0.29 J	0.78 UJ	2.90 NV
A1PII-S1-03-03-D*	0.52 -	0.19 J	0.18 J	0.19 J	1.64 UJ	2.30 NV
A1PII-S1-03-04	1.22 -	1.05 J	1.04 J	1.05 J	8.61 J	5.60 NV
A1PII-S1-03-05	1.24 -	1.14 J	1.16 J	1.14 J	11.78 J	4.90 NV
A1PII-S1-03-06	1.22 -	1.07 J	1.08 J	1.07 J	10.02 J	6.20 NV
A1PII-S1-03-07	1.19 -	1.19 J	1.27 J	1.19 J	6.05 J	4.90 NV
A1PII-S1-03-08	1.34 -	1.21 J	1.19 J	1.21 J	19.42 J	7.10 NV
A1PII-S1-03-09	1.14 -	1.06 J	1.07 J	1.06 J	17.17 J	9.40 NV
A1PII-S1-03-10	1.28 -	1.23 J	1.36 J	1.23 J	8.51 J	6.90 NV
A1PII-S1-03-11	1.27 -	1.04 J	1.02 J	1.04 J	12.11 J	7.10 NV
A1PII-S1-03-12	1.35 -	1.17 J	1.19 J	1.17 J	14.98 J	7.10 NV
A1PII-S1-03-13	1.19 -	1.02 J	1.04 J	1.02 J	2.55 J	7.70 NV
A1PII-S1-03-14	1.45 -	1.22 J	1.22 J	1.22 J	3.56 J	6.20 NV
A1PII-S1-03-15	1.14 -	1.07 J	1.09 J	1.07 J	17.66 J	6.20 NV
A1PII-S1-03-16	1.25 -	0.99 J	0.99 J	0.99 J	7.12 J	5.00 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	62.9% (LN)	11.4% (LN)	34.5% (LN)	11.4% (LN)	90.9% (N)	43.0% (LN)
Test Procedure	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (N)	t-Test (LN)
Sample Size	16	16	16	16	16	16
Est. Mean*	1.21	1.07	1.10	1.07	10.46	6.29
UCL	1.35	1.27	1.30	1.27	12.90	6.92
Prob.	- -	- -	- -	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.45 -	1.23 J	1.36 J	1.23 J	19.42 J	9.40 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size calculation	4 Pass	4 Pass	5 Pass	7 Pass	2 Pass	2 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valida

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ".

** - Sample was omitted from distribution testing (radionuclides only) because with the relatively small sample sizes for determining distribution a single very low value can improperly cause a failure of the Shapiro-Wilk test for normality (and lognormality).
The maximum value of the two duplicates was used in all statistical equations.

#: This 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.

MDC Corrected

000060

Table A-5 CU A1PII-S1-04 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1PII-S1-04-01	1.18 -	1.12 -	1.10 -	1.12 -	19.20 -	3.20 NV	20.00 NV
A1PII-S1-04-02**	1.24 -	1.10 -	1.07 -	1.10 -	22.50 -	7.80 NV	2.60 NV
A1PII-S1-04-03	1.20 -	1.19 -	1.17 -	1.19 -	27.80 -	6.00 NV	20.60 NV
A1PII-S1-04-04	1.07 -	0.99 -	0.96 -	0.99 -	12.10 -	6.80 NV	32.70 NV
A1PII-S1-04-04-D	1.08 -	1.01 -	1.01 -	1.01 -	11.10 -	5.10 NV	24.00 NV
A1PII-S1-04-05	1.18 -	1.17 -	1.16 -	1.17 -	17.30 -	4.50 NV	26.00 NV
A1PII-S1-04-06	1.15 -	1.08 -	1.06 -	1.08 -	15.20 -	6.20 NV	25.20 NV
A1PII-S1-04-07	1.02 -	1.05 -	1.02 -	1.05 -	10.60 -	5.20 NV	27.50 NV
A1PII-S1-04-08	1.29 -	1.29 -	1.31 -	1.29 -	21.40 -	4.20 NV	26.30 NV
A1PII-S1-04-09	1.05 -	1.02 -	1.01 -	1.02 -	9.47 -	6.40 NV	30.00 NV
A1PII-S1-04-10	1.31 -	1.27 -	1.26 -	1.27 -	13.00 -	7.10 NV	33.00 NV
A1PII-S1-04-11	1.14 -	1.10 -	1.07 -	1.11 -	21.10 -	6.90 NV	26.00 NV
A1PII-S1-04-12	1.10 -	1.08 -	1.04 -	1.08 -	12.30 -	9.10 NV	25.80 NV
A1PII-S1-04-13***	0.58 J	0.44 -	0.43 -	0.44 -	4.80 UJ	4.80 NV	20.00 NV
A1PII-S1-04-14	1.06 -	1.03 -	1.02 -	1.03 -	19.00 -	6.90 NV	16.70 NV
A1PII-S1-04-15	1.24 -	1.18 -	1.16 -	1.18 -	29.40 -	7.90 NV	33.30 NV
A1PII-S1-04-16	1.32 -	1.19 -	1.17 -	1.19 -	11.50 -	5.80 NV	24.00 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
W-statistic Prob. #	64.5% (LN)	46.9% (LN)	10.6% (LN)	51.7% (LN)	58.5% (LN)	99.1% (N)	43.2% (N)
Test Procedure	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (N)	t-Test (N)
Sample Size	16	16	16	16	16	16	16
Est. Mean*	1.14	1.09	1.07	1.09	17.38	6.18	24.36
UCL	1.24	1.23	1.21	1.23	24.13	6.69	26.90
Prob.	- -	- -	- -	- -	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.32 -	1.29 -	1.31 -	1.29 -	29.40 -	9.10 NV	33.30 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -	- -
a posteriori Sample Size calculation	3 Pass	3 Pass	3 Pass	5 Pass	3 Pass	2 Pass	1 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"

/* - Sample was omitted from distribution testing (** lead / *** radionuclides only) because with the relatively small sample sizes for determining distribution a single very low value can improperly cause a failure of the Shapiro-Wilk test for normality (and lognormality).

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

#: This 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.

MDC Corrected

3266

000051

Table A-6 CU A1PII-S1-05 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-S1-05-01	1.10 -	0.97 -	1.00 -	0.97 -	4.60 J	5.50 NV
A1PII-S1-05-02	1.10 -	0.97 -	1.00 -	0.97 -	3.20 J	6.20 NV
A1PII-S1-05-03	1.20 -	0.76 -	0.76 -	0.76 -	10.36 J	5.90 NV
A1PII-S1-05-04	1.00 -	0.89 -	0.90 -	0.89 -	7.10 J	5.00 NV
A1PII-S1-05-05	1.00 -	0.89 -	0.90 -	0.89 -	10.27 J	3.20 NV
A1PII-S1-05-05-D	1.00 -	0.80 -	0.86 -	0.80 -	11.59 J	5.20 NV
A1PII-S1-05-06	1.40 -	1.10 -	1.10 -	1.10 -	10.70 J	17.10 NV
A1PII-S1-05-07	1.20 -	1.10 -	1.20 -	1.10 -	4.60 J	5.70 NV
A1PII-S1-05-08	0.98 -	0.89 -	0.91 -	0.89 -	5.80 J	6.40 NV
A1PII-S1-05-09	1.20 -	0.99 -	1.00 -	0.99 -	15.00 J	4.10 NV
A1PII-S1-05-10	1.30 -	1.20 -	1.40 -	1.20 -	2.80 J	7.10 NV
A1PII-S1-05-11	0.96 -	0.89 -	0.96 -	0.89 -	5.80 J	5.80 NV
A1PII-S1-05-12	1.00 -	0.75 -	0.74 -	0.75 -	15.00 J	9.20 NV
A1PII-S1-05-13	0.97 -	0.77 -	0.74 -	0.77 -	10.00 J	17.50 NV
A1PII-S1-05-14	0.95 -	0.87 -	0.94 -	0.87 -	3.00 J	6.50 NV
A1PII-S1-05-15	1.20 -	1.00 -	1.00 -	1.00 -	10.83 J	4.60 NV
A1PII-S1-05-16	1.20 -	1.20 -	1.20 -	1.20 -	2.75 J	10.10 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	7.4% (LN)	35.1% (LN)	41.7% (LN)	35.1% (LN)	11.6% (LN)	1.1% (LN)
Test Procedure	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (LN)	Median
Sample Size	16	16	16	16	16	16
Est. Mean*	1.11	0.95	0.99	0.95	7.87	6.05 **
UCL	1.17	1.02	1.07	1.02	11.03	7.10
Prob.	- -	- -	- -	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.40 -	1.20 -	1.40 -	1.20 -	15.00 J	17.50 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	2 Pass	2 Pass	7 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"

** - The median (Est. Mean) for Arsenic is the average of the 8th and 9th ranked sample results. These two values are "5.9 NV" (..-03) and "6.2 NV" (..-02). The maximum value of the two duplicates was used in all statistical equations.

#: This 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.

MDC Corrected

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Table A-7 CU A1PII-S1-06 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1PII-S1-06-01	1.35 -	1.19 -	1.15 -	1.18 -	12.90 -	4.70 NV	51.30 NV
A1PII-S1-06-02	1.17 -	1.12 -	1.11 -	1.12 -	12.50 -	4.90 NV	19.10 NV
A1PII-S1-06-03	1.29 -	1.25 -	1.22 -	1.25 -	12.00 -	6.60 NV	22.60 NV
A1PII-S1-06-04	1.12 -	1.13 -	1.15 -	1.13 -	14.30 -	4.60 NV	22.70 NV
A1PII-S1-06-05	1.05 -	1.00 -	1.01 -	1.00 -	7.35 -	3.90 NV	24.80 NV
A1PII-S1-06-06	1.12 -	1.13 -	1.12 -	1.13 -	13.60 -	5.90 NV	20.50 NV
A1PII-S1-06-06-D	1.21 -	1.03 -	1.04 -	1.03 -	13.00 -	4.20 NV	19.30 NV
A1PII-S1-06-07	1.04 -	0.98 -	0.97 -	0.98 -	10.30 -	3.80 NV	18.90 NV
A1PII-S1-06-08	1.14 -	1.06 -	1.04 -	1.06 -	14.90 -	3.50 NV	23.70 NV
A1PII-S1-06-09	1.11 -	1.07 -	1.05 -	1.07 -	9.50 -	6.70 NV	18.10 NV
A1PII-S1-06-10	1.20 -	0.90 -	0.88 -	0.90 -	11.50 -	4.40 NV	23.50 NV
A1PII-S1-06-11	1.07 -	1.09 -	1.08 -	1.09 -	11.00 -	5.50 NV	34.70 NV
A1PII-S1-06-12	1.42 -	1.22 -	1.24 -	1.22 -	11.60 -	5.20 NV	28.20 NV
A1PII-S1-06-13	1.17 -	1.10 -	1.10 -	1.10 -	11.70 -	7.20 NV	27.30 NV
A1PII-S1-06-14	1.24 -	1.22 -	1.21 -	1.22 -	15.30 -	6.80 NV	19.10 NV
A1PII-S1-06-15	1.22 -	1.15 -	1.15 -	1.15 -	20.20 -	5.80 NV	20.50 NV
A1PII-S1-06-16	1.12 -	1.02 -	1.01 -	1.02 -	9.30 UJ	6.20 NV	16.80 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
W-statistic Prob. #	68.9% (LN)	88.8% (N)	83.0% (N)	90.7% (N)	58.1% (N)	65.1% (N)	2.4% (LN)
Test Procedure	t-Test (LN)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)	Median
Sample Size	16	16	16	16	16	16	16
Est. Mean*	1.18	1.10	1.09	1.10	12.08	5.36	22.65 **
UCL	1.23	1.14	1.14	1.14	13.61	5.75	24.80
Prob.	- -	- -	- -	- -	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.42 -	1.25 -	1.24 -	1.25 -	20.20 -	7.20 NV	51.30 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -	- -
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	2 Pass	2 Pass	1 Pass	2 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"

** - The median (Est. Mean) for Lead is the average of the 8th and 9th ranked sample results. These two values are "22.6 NV" (..-03) and "22.7 NV" ..-04). The maximum value of the two duplicates was used in all statistical equations.

#: This 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.

MDC Corrected

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Table A-8 CU A1PII-S1-07 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1PII-S1-07-01	1.10 -	1.10 -	1.10 -	1.10 -	10.20 J	6.40 -	16.80 -
A1PII-S1-07-02	1.20 -	1.10 -	1.00 -	1.10 -	6.60 J	5.10 -	25.70 -
A1PII-S1-07-03	1.20 -	1.10 -	1.10 -	1.10 -	11.00 J	4.40 J	16.90 -
A1PII-S1-07-04	1.20 -	1.10 -	1.20 -	1.20 -	11.90 J	8.50 -	19.70 -
A1PII-S1-07-05	1.30 -	1.24 -	1.33 -	1.24 -	5.15 J	5.10 -	16.10 U
A1PII-S1-07-06	1.10 -	1.10 -	1.10 -	1.10 -	10.18 J	4.60 -	26.40 -
A1PII-S1-07-07	1.40 -	1.20 -	1.20 -	1.20 -	7.40 J	10.00 -	23.80 -
A1PII-S1-07-07-D	1.40 -	1.10 -	1.20 -	1.20 -	9.80 J	8.40 -	15.60 U
A1PII-S1-07-08	1.30 -	1.10 -	1.10 -	1.20 -	4.90 J	4.60 -	16.10 U
A1PII-S1-07-09	1.10 -	1.00 -	1.10 -	1.10 -	5.40 J	6.20 -	18.20 -
A1PII-S1-07-10	1.20 -	1.10 -	1.20 -	1.20 -	6.20 J	4.60 -	14.10 U
A1PII-S1-07-11	1.10 -	1.00 -	1.00 -	1.00 -	9.10 J	9.80 J	26.90 -
A1PII-S1-07-12	1.80 -	1.60 -	1.70 -	1.70 -	6.00 J	8.30 -	23.30 -
A1PII-S1-07-13	1.40 -	1.20 -	1.20 -	1.20 -	8.00 J	3.40 -	10.70 UJ
A1PII-S1-07-14	1.30 -	1.10 -	1.10 -	1.20 -	7.00 J	7.60 -	14.60 UJ
A1PII-S1-07-15	1.20 -	1.20 -	1.20 -	1.20 -	10.00 J	7.10 J	18.80 J
A1PII-S1-07-16	1.40 -	1.10 -	1.10 -	1.10 -	8.80 J	7.10 J	18.90 J
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
W-statistic Prob. #	1.4% (LN)	0.0% (LN)	0.1% (LN)	0.0% (LN)	30.1% (N)	54.1% (LN)	not tested
Test Procedure	Median	Median	Median	Median	t-Test (N)	t-Test (LN)	Proportions
Sample Size	16	16	16	16	16	16	16
Est. Mean*	1.20	1.10	1.10	1.20	8.14	6.45	18.50 **
UCL	1.30	1.20	1.20	1.20	9.13	7.25	19.48
Prob.	- -	- -	- -	- -	- -	- -	0.009%
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.80 -	1.60 -	1.70 -	1.70 -	11.90 J	10.00 -	26.90 -
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -	- -
a posteriori Sample Size calculation	6 Pass	3 Pass	6 Pass	6 Pass	2 Pass	2 Pass	2 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not vali

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"

** - The median (Est. Mean) for Lead is the average of the 8th and 9th ranked sample results. These two values are "18.2 -" (..-09) and "18.8 J" (..-15). The maximum value of the two duplicates was used in all statistical equations.

#: This 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.

MDC Corrected

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Table A-9 CU A1PII-S1-08 Summary Statistics

Area 1 Phase 2 Characterization for Reuse Statistics

	RADIONUCLIDES					METALS
Station Number	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-S1-08-01	1.18 -	1.22 -	1.24 -	1.22 -	12.65 J	4.70 NV
A1PII-S1-08-02	1.13 -	0.89 -	0.87 -	0.89 -	8.12 J	3.50 NV
A1PII-S1-08-03	1.17 -	1.09 -	1.16 -	1.09 -	6.77 J	4.10 NV
A1PII-S1-08-04	1.11 -	0.89 -	0.91 -	0.89 -	9.13 J	3.70 NV
A1PII-S1-08-05	1.15 -	1.06 -	1.10 -	1.06 -	4.16 J	4.30 NV
A1PII-S1-08-06	1.22 -	1.12 -	1.13 -	1.12 -	8.69 J	3.90 NV
A1PII-S1-08-07	1.17 -	1.06 -	1.11 -	1.06 -	8.56 J	2.40 NV
A1PII-S1-08-08	1.23 -	1.16 -	1.23 -	1.57 -	5.88 J	4.50 NV
A1PII-S1-08-08-D	1.30 -	1.12 -	1.23 -	1.12 -	8.68 J	4.70 NV
A1PII-S1-08-09	1.16 -	0.95 -	0.93 -	0.95 -	10.73 J	6.10 NV
A1PII-S1-08-10	1.06 -	0.86 -	0.86 -	0.86 -	12.16 J	7.60 NV
A1PII-S1-08-11	1.19 -	1.01 -	1.01 -	1.01 -	3.49 J	9.40 NV
A1PII-S1-08-12	1.05 -	0.99 -	1.00 -	0.99 -	7.71 J	2.60 NV
A1PII-S1-08-13	1.15 -	1.07 -	1.12 -	1.07 -	10.36 J	6.10 NV
A1PII-S1-08-14	1.02 -	0.87 -	0.86 -	0.87 -	2.69 J	6.00 NV
A1PII-S1-08-15	0.98 -	0.82 -	0.83 -	0.82 -	5.60 J	6.10 NV
A1PII-S1-08-16	1.09 -	1.01 -	1.05 -	1.01 -	14.92 J	2.70 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	85.8% (N)	71.9% (N)	26.1% (N)	9.5% (LN)	91.7% (N)	77.4% (LN)
Test Procedure	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (LN)	t-Test (N)	t-Test (LN)
Sample Size	16	16	16	16	16	16
Est. Mean*	1.13	1.00	1.03	1.03	8.40	4.89
UCL	1.17	1.05	1.08	1.11	9.88	5.66
Prob.	- -	- -	- -	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.30 -	1.22 -	1.24 -	1.22 -	14.92 J	9.40 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	3 Pass	2 Pass	2 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimate
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not vali a

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

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Table A-10 CU A1PII-S1-09 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-S1-09-01	1.17 -	1.15 J	1.14 J	1.15 J	11.20 -	2.70 NV
A1PII-S1-09-02	1.25 -	1.17 J	1.17 J	1.17 J	12.10 -	3.30 NV
A1PII-S1-09-03	1.12 -	1.09 J	1.07 J	1.09 J	8.87 -	3.50 NV
A1PII-S1-09-04	1.28 -	1.24 J	1.21 J	1.24 J	11.70 -	4.00 NV
A1PII-S1-09-05	1.27 -	1.37 J	1.35 J	1.37 J	12.20 -	4.60 NV
A1PII-S1-09-06	1.20 -	1.23 J	1.22 J	1.23 J	14.60 -	4.60 NV
A1PII-S1-09-07	1.19 -	1.27 J	1.24 J	1.27 J	15.40 -	4.00 NV
A1PII-S1-09-08	0.96 -	0.89 J	0.86 J	0.89 J	6.97 -	4.90 NV
A1PII-S1-09-09	1.19 -	1.20 J	1.18 J	1.20 J	12.70 -	4.60 NV
A1PII-S1-09-09-D	1.12 -	1.29 -	1.27 -	1.29 -	12.20 -	5.20 NV
A1PII-S1-09-10	1.25 -	1.25 J	1.24 J	1.25 J	17.30 -	4.80 NV
A1PII-S1-09-11	1.36 -	1.35 J	1.31 J	1.35 J	13.10 -	4.20 NV
A1PII-S1-09-12	1.32 -	1.35 J	1.37 J	1.35 J	15.10 -	4.80 NV
A1PII-S1-09-13	1.25 -	1.25 J	1.22 J	1.25 J	11.70 -	4.30 NV
A1PII-S1-09-14	1.20 -	1.20 J	1.20 J	1.20 J	12.90 -	5.80 NV
A1PII-S1-09-15	1.26 -	1.30 J	1.28 J	1.30 J	16.30 -	5.60 NV
A1PII-S1-09-16	1.08 -	1.15 J	1.12 J	1.15 J	11.60 -	4.10 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	21.8% (N)	5.1% (N)	6.4% (N)	5.1% (N)	64.5% (N)	95.8% (N)
Test Procedure	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)
Sample Size	16	16	16	16	16	16
Est. Mean*	1.21	1.22	1.20	1.22	12.73	4.40
UCL	1.25	1.27	1.26	1.27	13.89	4.67
Prob.	- -	- -	- -	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.36 -	1.37 J	1.37 J	1.37 J	17.30 -	5.80 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	3 Pass	2 Pass	1 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valida

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

MDC Corrected

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Table A-11 CU A1PII-S1-10 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-S1-10-01	1.16 -	1.11 -	1.15 -	1.11 -	8.13 J	5.50 NV
A1PII-S1-10-02	1.11 -	1.03 -	1.07 -	1.03 -	6.84 J	4.20 NV
A1PII-S1-10-03	1.10 -	1.16 -	1.28 -	1.16 -	4.86 J	5.10 NV
A1PII-S1-10-04	1.14 -	1.04 -	1.07 -	1.04 -	6.54 J	4.70 NV
A1PII-S1-10-05	1.16 -	1.05 -	1.14 -	1.05 -	5.25 J	8.40 NV
A1PII-S1-10-06	1.18 -	1.13 -	1.15 -	1.13 -	8.50 J	5.40 NV
A1PII-S1-10-07	1.03 -	0.79 -	0.78 -	0.79 -	11.76 J	4.20 NV
A1PII-S1-10-08	1.08 -	1.10 -	1.18 -	1.10 -	5.50 J	4.40 NV
A1PII-S1-10-09	1.15 -	1.09 -	1.16 -	1.09 -	9.48 J	6.00 NV
A1PII-S1-10-10	1.10 -	0.91 -	0.91 -	0.91 -	11.81 J	5.00 NV
A1PII-S1-10-10-D	1.11 -	1.16 -	1.21 -	1.16 -	6.64 J	5.00 NV
A1PII-S1-10-11	1.13 -	1.13 -	1.16 -	1.13 -	5.80 J	4.30 NV
A1PII-S1-10-12	1.22 -	1.00 -	1.04 -	1.00 -	7.98 J	4.90 NV
A1PII-S1-10-13	1.06 -	0.83 -	0.83 -	0.83 -	9.13 J	4.40 NV
A1PII-S1-10-14	1.22 -	1.04 -	1.09 -	1.04 -	4.82 J	6.00 NV
A1PII-S1-10-15	1.15 -	1.04 -	1.11 -	1.04 -	9.26 J	4.70 NV
A1PII-S1-10-16	1.22 -	1.19 -	1.30 -	1.19 -	7.06 J	5.40 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	63.8% (N)	1.2% (N)	2.9% (N)	1.2% (N)	47.7% (LN)	2.6% (LN)
Test Procedure	t-Test (N)	Wilcoxon	Wilcoxon	Wilcoxon	t-Test (LN)	Median
Sample Size	16	16	16	16	16	16
Est. Mean*	1.14	1.07 **	1.15 **	1.07 **	7.69	4.95 **
UCL	1.16	--	--	--	8.85	5.40
Prob.	--	0.024%	0.024%	0.024%	--	--
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.22 -	1.19 -	1.30 -	1.19 -	11.81 J	8.40 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	--
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	3 Pass	2 Pass	2 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valide

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
** - The median (Est. Mean) for these parameters is the average of the 8th and 9th ranked sample results.
Radium-228: The two values are "1.053 -" (..-05) and "1.092 -" (..-09).
Thorium-228: The two values are "1.141 J" (..-05) and "1.149 J" (..-01).
Thorium-232: The two values are "1.053 -" (..-05) and "1.092 -" (..-09).
Arsenic: The two values are "4.9 NV" (..-12) and "5.0 NV" (..-10/..-10-D).
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

MDC Corrected

Table A-12 CU A1PII-S1-11 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-S1-11-01	1.29 -	1.22 J	1.24 J	1.22 J	11.00 J	5.70 UJ
A1PII-S1-11-02	1.51 -	1.42 J	1.42 J	1.42 J	15.10 J	6.60 UJ
A1PII-S1-11-03	1.38 -	1.31 J	1.32 J	1.31 J	10.50 J	5.50 UJ
A1PII-S1-11-04	1.25 -	1.23 J	1.24 J	1.23 J	13.90 J	4.50 UJ
A1PII-S1-11-05	1.30 UJ	2.20 UJ	1.30 J	2.20 UJ	5.67 J	6.50 UJ
A1PII-S1-11-06	1.16 -	1.10 J	1.12 J	1.10 J	11.30 J	2.90 UJ
A1PII-S1-11-07	1.20 -	1.18 J	1.20 J	1.18 J	5.25 J	5.00 UJ
A1PII-S1-11-08	1.30 -	1.19 J	1.20 J	1.19 J	10.80 J	3.10 UJ
A1PII-S1-11-09	1.24 -	1.22 J	1.25 J	1.22 J	13.50 J	3.80 UJ
A1PII-S1-11-10	1.25 -	1.11 J	1.12 J	1.11 J	7.30 J	3.80 UJ
A1PII-S1-11-11	1.23 -	1.43 J	1.24 J	1.43 J	5.09 J	5.70 UJ
A1PII-S1-11-11-D	1.20 -	1.19 J	1.20 J	1.19 J	10.40 J	3.80 UJ
A1PII-S1-11-12**	0.58 -	0.39 UJ	0.31 UJ	0.39 UJ	4.20 UJ	3.50 UJ
A1PII-S1-11-13	1.26 -	1.26 J	1.28 J	1.26 J	12.20 J	4.30 UJ
A1PII-S1-11-14	1.39 -	1.09 J	1.09 J	1.09 J	7.53 J	6.50 UJ
A1PII-S1-11-15	1.24 -	1.17 J	1.18 J	1.17 J	14.30 J	4.10 UJ
A1PII-S1-11-16	1.29 -	1.19 J	1.18 J	1.19 J	15.30 J	3.30 UJ
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	0.0% (N)	0.0% (N)	0.0% (N)	0.0% (N)	31.9% (N)	not tested
Test Procedure	Median	Median	Median	Median	t-Test (N)	Proportions
Sample Size	16	16	16	16	16	16
Est. Mean*	1.25	1.19	1.20	1.19	10.38	2.20
UCL	1.29	1.23	1.24	1.23	12.08	- -
Prob.	- -	- -	- -	- -	- -	0.009%
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.51 -	2.20 UJ	1.42 J	2.20 UJ	15.30 J	6.60 UJ
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size calculation	3 Pass	3 Pass	3 Pass	3 Pass	2 Pass	2 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not validat

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

MDC Corrected

000068

Table A-13 CU A1PII-S1-12 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-S1-12-01	1.63 -	1.38 J	1.51 J	1.38 J	8.79 J	3.70 NV
A1PII-S1-12-02	1.44 -	1.31 J	1.43 J	1.31 J	6.06 J	4.70 NV
A1PII-S1-12-03	1.42 -	1.00 J	1.03 J	1.00 J	6.70 J	4.80 NV
A1PII-S1-12-04	1.30 -	1.19 J	1.33 J	1.19 J	4.31 J	3.40 NV
A1PII-S1-12-05	1.13 -	1.08 J	1.10 J	1.08 J	5.99 J	2.60 NV
A1PII-S1-12-06	1.12 -	1.01 J	1.04 J	1.01 J	5.96 J	3.90 NV
A1PII-S1-12-07	1.19 -	1.09 J	1.15 J	1.09 J	3.77 J	2.70 NV
A1PII-S1-12-08	1.19 -	1.07 J	1.10 J	1.07 J	8.44 J	2.80 NV
A1PII-S1-12-09	1.23 -	1.13 J	1.15 J	1.13 J	6.25 J	4.00 NV
A1PII-S1-12-10	1.19 -	0.99 J	1.02 J	0.99 J	7.54 J	3.10 NV
A1PII-S1-12-11	1.20 -	0.99 J	1.03 J	0.99 J	4.01 J	2.30 NV
A1PII-S1-12-12	1.17 -	0.91 J	0.91 J	0.91 J	7.99 J	3.50 NV
A1PII-S1-12-12-D	1.17 -	1.02 J	1.12 J	1.02 J	4.26 J	4.13 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	3.1% (LN)	4.99% (LN)	3.0% (LN)	4.99% (LN)	46.7% (N)	68.6% (LN)
Test Procedure	Wilcoxon	Wilcoxon	Wilcoxon	Wilcoxon	t-Test (N)	t-Test (LN)
Sample Size	12	12	12	12	12	12
Est. Mean*	1.20	1.08	1.11	1.08	6.32	3.52
UCL	- -	- -	- -	- -	7.19	3.90
Prob.	0.126%	0.126%	0.126%	0.126%	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.63 -	1.38 J	1.51 J	1.38 J	8.79 J	4.80 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size calculation	3 Pass	2 Pass	3 Pass	3 Pass	2 Pass	1 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

MDC Corrected

Table A-14 CU A1PII-S1-13 Summary Statistics

Area 1 Phase II Certification Statistics

	RADIONUCLIDES					METALS
Station Number	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-S1-13-01	1.27 J	1.03 J	1.03 J	1.03 J	8.84 J	3.80 NV
A1PII-S1-13-01-D	1.09 J	0.84 J	0.85 J	0.84 J	5.49 J	4.18 NV
A1PII-S1-13-02	1.26 J	1.19 J	1.26 J	1.19 J	3.36 J	3.90 NV
A1PII-S1-13-03	1.18 J	1.05 J	1.06 J	1.05 J	8.19 J	4.30 NV
A1PII-S1-13-04	1.48 J	1.15 J	1.16 J	1.15 J	3.74 J	7.10 NV
A1PII-S1-13-05	1.20 J	1.04 J	1.04 J	1.04 J	5.87 J	4.80 NV
A1PII-S1-13-06	1.14 J	1.07 J	1.12 J	1.07 J	8.01 J	3.90 NV
A1PII-S1-13-07	1.28 J	1.11 J	1.16 J	1.11 J	6.51 J	3.90 NV
A1PII-S1-13-08	1.21 J	1.18 J	1.27 J	1.18 J	4.18 J	3.10 NV
A1PII-S1-13-09	1.31 J	1.21 J	1.27 J	1.21 J	9.11 J	4.80 NV
A1PII-S1-13-10	1.24 J	1.09 J	1.14 J	1.09 J	9.69 J	4.44 NV
A1PII-S1-13-11	1.13 J	0.85 J	0.85 J	0.85 J	9.53 J	5.68 NV
A1PII-S1-13-12	1.31 J	1.23 J	1.31 J	1.23 J	4.38 J	4.10 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	38.2% (LN)	17.8% (N)	38.5% (N)	17.8% (N)	12.6% (N)	28.0% (LN)
Test Procedure	t-Test (LN)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (LN)
Sample Size	12	12	12	12	12	12
Est. Mean*	1.25	1.10	1.14	1.10	6.78	4.52
UCL	1.30	1.16	1.21	1.16	8.03	4.93
Prob.	- -	- -	- -	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.48 J	1.23 J	1.31 J	1.23 J	9.69 J	7.10 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	2 Pass	2 Pass	2 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

MDC Corrected

000070

Table A-15 CU A1PII-S1-14 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-S1-14-01	1.25 -	1.02 -	1.06 J	1.02 -	9.37 J	6.10 NV
A1PII-S1-14-02-D	1.23 -	1.01 -	1.04 J	1.01 -	3.91 J	5.20 NV
A1PII-S1-14-02	1.33 -	1.07 -	1.11 J	1.07 -	3.06 J	4.80 NV
A1PII-S1-14-03	1.20 -	1.09 -	1.15 J	1.09 -	5.19 J	5.90 NV
A1PII-S1-14-04	1.31 -	1.20 -	1.31 J	1.20 -	3.83 J	9.20 NV
A1PII-S1-14-05	1.27 -	1.01 -	1.01 J	1.01 -	6.45 J	4.80 NV
A1PII-S1-14-06	1.19 -	0.81 -	0.81 J	0.81 -	7.10 J	6.70 NV
A1PII-S1-14-07	1.29 -	1.18 -	1.29 J	1.18 -	4.47 J	8.00 NV
A1PII-S1-14-08	1.25 -	1.00 -	0.99 J	1.00 -	6.37 J	9.80 NV
A1PII-S1-14-09	1.31 -	1.08 -	1.11 J	1.08 -	7.60 J	6.00 NV
A1PII-S1-14-10	1.33 -	1.14 -	1.21 J	1.14 -	4.16 J	0.14 UNV
A1PII-S1-14-11	1.23 -	1.01 -	1.03 J	1.01 -	8.33 J	6.20 NV
A1PII-S1-14-12	1.34 -	1.12 -	1.19 J	1.12 -	5.38 J	6.50 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	45.7% (N)	18.2% (N)	78.6% (N)	17.9% (N)	57.7% (LN)	6.9% (N)
Test Procedure	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (LN)	t-Test (N)
Sample Size	12	12	12	12	12	12
Est. Mean*	1.28	1.06	1.11	1.06	6.04	6.21
UCL	1.30	1.12	1.18	1.12	7.21	7.17
Prob.	- -	- -	- -	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.34 -	1.20 -	1.31 J	1.20 -	9.37 J	9.80 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	2 Pass	2 Pass	2 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valida

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

MDC Corrected

000071

Table A-16 CU A1PII-S1-15 Summary Statistics

Area 1 Phase II Certification Statistics

	RADIONUCLIDES					METALS
Station Number	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-S1-15-01	1.21 J	1.00 J	1.07 J	1.00 J	4.96 J	5.79 NV
A1PII-S1-15-02	1.35 J	1.23 J	1.23 J	1.23 J	5.34 J	3.47 NV
A1PII-S1-15-03	1.44 J	1.41 J	1.39 J	1.41 J	8.79 J	5.31 NV
A1PII-S1-15-03-D	1.23 J	1.05 J	1.11 J	1.05 J	8.07 J	4.75 NV
A1PII-S1-15-04	1.29 J	1.20 J	1.30 J	1.20 J	4.08 J	3.43 NV
A1PII-S1-15-05	1.17 J	0.98 J	1.00 J	0.98 J	7.57 J	3.66 NV
A1PII-S1-15-06	1.21 J	1.03 J	1.10 J	1.03 J	9.66 J	4.81 NV
A1PII-S1-15-07	1.20 J	1.10 J	1.10 J	1.10 J	4.10 J	3.17 NV
A1PII-S1-15-08	1.16 J	1.07 J	1.07 J	1.07 J	4.64 J	3.42 NV
A1PII-S1-15-09	1.22 J	1.07 J	1.10 J	1.07 J	6.84 J	4.88 NV
A1PII-S1-15-10	1.27 J	1.13 J	1.15 J	1.13 J	3.76 J	5.01 NV
A1PII-S1-15-11	1.23 J	1.03 J	1.03 J	1.03 J	7.06 J	4.49 NV
A1PII-S1-15-12	1.35 J	1.04 J	1.07 J	1.04 J	6.82 J	5.57 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	31.3% (LN)	11.8% (LN)	10.0% (LN)	11.8% (LN)	49.0% (LN)	16.8% (N)
Test Procedure	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (N)
Sample Size	12	12	12	12	12	12
Est. Mean*	1.26	1.11	1.13	1.11	6.16	4.42
UCL	1.30	1.17	1.19	1.17	7.42	4.79
Prob.	- -	- -	- -	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.44 J	1.41 J	1.39 J	1.41 J	9.66 J	5.79 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	3 Pass	2 Pass	1 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
"-" = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

MDC Corrected

000072

Table A-17 CU A1PII-S1-16 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	METALS Arsenic
A1PII-S1-16-01	1.10 J	1.10 J	1.10 J	1.10 J	2.86 J	2.87 NV
A1PII-S1-16-02	0.88 J	0.70 J	0.73 J	0.70 J	4.00 J	4.05 NV
A1PII-S1-16-03	1.20 J	1.10 J	1.10 J	1.10 J	7.90 J	4.31 NV
A1PII-S1-16-04	1.30 J	1.10 J	1.20 J	1.12 J	4.70 J	4.18 NV
A1PII-S1-16-04-D	1.10 J	0.84 J	0.84 J	0.84 J	5.50 J	2.93 NV
A1PII-S1-16-05	1.10 J	0.99 J	1.00 J	1.00 J	5.90 J	3.47 NV
A1PII-S1-16-06	1.20 J	1.10 J	1.10 J	1.10 J	7.30 J	6.96 NV
A1PII-S1-16-07	1.20 J	0.95 J	0.98 J	0.95 J	6.80 J	3.70 NV
A1PII-S1-16-08	1.30 J	1.10 J	1.10 J	1.12 J	3.30 J	4.02 NV
A1PII-S1-16-09	1.20 J	1.10 J	1.20 J	1.10 J	7.90 J	2.83 NV
A1PII-S1-16-10	1.10 J	1.00 J	1.10 J	1.04 J	8.50 J	3.01 NV
A1PII-S1-16-11	1.20 J	1.10 J	1.20 J	1.10 J	4.00 J	4.66 NV
A1PII-S1-16-12	1.30 J	1.10 J	1.10 J	1.10 J	7.10 J	4.84 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	2.3% (N)	0.0% (N)	0.3% (N)	0.0% (N)	28.1% (N)	41.7% (LN)
Test Procedure	Wilcoxon	Median	Wilcoxon	Median	t-Test (N)	t-Test (LN)
Sample Size	12	12	12	12	12	12
Est. Mean*	1.20	1.10	1.10	1.10	5.92	4.08
UCL	- -	1.10	- -	1.10	6.94	4.54
Prob.	0.108%	- -	0.110%	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.30 J	1.10 J	1.20 J	1.12 J	8.50 J	6.96 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size	2	3	2	3	2	2
calculation	Pass	Pass	Pass	Pass	Pass	Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

MDC Corrected

Table A-18 CU A1PII-S1-17 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-S1-17-01	1.02 -	1.11 -	1.07 -	1.11 -	8.51 -	3.19 NV
A1PII-S1-17-02	0.93 -	1.03 -	0.96 -	1.03 -	7.93 -	3.08 NV
A1PII-S1-17-03	1.05 -	1.01 -	0.99 -	1.01 -	8.52 -	3.27 NV
A1PII-S1-17-04	1.00 -	1.03 -	1.02 -	1.03 -	7.04 -	4.88 NV
A1PII-S1-17-05	1.12 -	0.97 -	0.95 -	0.97 -	9.68 -	4.29 NV
A1PII-S1-17-05-D	0.95 -	0.82 -	0.81 -	0.82 -	7.11 -	5.22 NV
A1PII-S1-17-06	1.04 -	0.92 -	0.92 -	0.92 -	8.88 -	2.34 NV
A1PII-S1-17-07	1.16 -	1.12 -	1.13 -	1.12 -	10.40 -	3.90 NV
A1PII-S1-17-08	1.16 -	1.07 -	1.06 -	1.07 -	9.16 -	4.30 NV
A1PII-S1-17-09	1.13 -	1.02 -	1.02 -	1.02 -	9.73 -	3.80 NV
A1PII-S1-17-10	1.14 -	1.07 -	1.09 -	1.07 -	9.36 -	4.50 NV
A1PII-S1-17-11	1.16 -	1.09 -	1.09 -	1.09 -	9.33 -	5.90 NV
A1PII-S1-17-12	1.21 -	1.15 -	1.13 -	1.15 -	10.40 -	4.10 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	36.2% (N)	93.1% (N)	64.3% (N)	93.1% (N)	68.5% (N)	99.6% (N)
Test Procedure	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)
Sample Size	12	12	12	12	12	12
Est. Mean*	1.09	1.05	1.04	1.05	9.08	4.04
UCL	1.14	1.08	1.07	1.08	9.59	4.43
Prob.	- -	- -	- -	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.21 -	1.15 -	1.13 -	1.15 -	10.40 -	5.90 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	2 Pass	2 Pass	1 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

MDC Corrected

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Table A-19 CU A1PII-S1-18 Summary Statistics

Area 1 Phase II Certification Statistics

Station Number	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1PII-S1-18-01	1.43 -	1.13 -	1.11 -	1.13 -	12.00 -	6.30 NV	33.30 NV
A1PII-S1-18-02	1.02 -	1.08 -	1.04 -	1.08 -	17.70 -	6.70 NV	27.50 NV
A1PII-S1-18-03	1.30 -	1.19 -	1.17 -	1.19 -	19.00 -	5.50 NV	20.00 NV
A1PII-S1-18-04	1.14 -	1.09 -	1.07 -	1.09 -	14.30 -	4.40 NV	16.90 NV
A1PII-S1-18-05	1.19 R	1.21 R	1.16 R	1.21 R	15.30 R	6.60 NV	21.50 NV
A1PII-S1-18-06	1.13 -	1.10 -	1.06 -	1.10 -	15.90 -	4.90 NV	30.60 NV
A1PII-S1-18-06-D	1.14 -	1.11 -	1.11 -	1.11 -	18.40 -	5.10 NV	33.40 NV
A1PII-S1-18-07	1.09 -	1.14 -	1.09 -	1.14 -	13.80 -	4.90 NV	19.50 NV
A1PII-S1-18-08	1.08 -	1.07 -	1.04 -	1.07 -	13.10 -	3.40 NV	16.50 NV
A1PII-S1-18-09	1.16 -	1.15 -	1.14 -	1.15 -	18.60 -	4.00 NV	18.10 NV
A1PII-S1-18-10	1.06 -	1.04 -	1.01 -	1.04 -	15.50 -	3.50 NV	17.90 NV
A1PII-S1-18-11	1.18 -	1.09 -	1.06 -	1.09 -	14.10 -	3.60 NV	17.50 NV
A1PII-S1-18-12	1.13 -	1.07 -	1.04 -	1.07 -	15.80 -	4.90 NV	21.70 NV
A1PII-S1-18-13	1.22 -	1.13 -	1.09 -	1.13 -	22.10 -	6.70 NV	23.40 NV
A1PII-S1-18-14	1.16 -	1.09 -	1.05 -	1.09 -	17.40 -	5.10 NV	18.40 NV
A1PII-S1-18-15	0.97 -	0.99 -	0.96 -	0.99 -	5.36 -	3.20 NV	12.50 NV
A1PII-S1-18-16	1.16 -	1.20 -	1.19 -	1.20 -	18.70 -	7.00 NV	18.20 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
W-statistic Prob. #	49.7% (LN)	81.2% (N)	90.9% (N)	81.2% (N)	18.8% (N)	18.9% (LN)	17.0% (LN)
Test Procedure	t-Test (LN)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (LN)	t-Test (LN)
Sample Size	15	15	15	15	15	16	16
Est. Mean*	1.15	1.10	1.08	1.10	15.72	5.07	21.03
UCL	1.20	1.13	1.11	1.13	17.52	5.58	23.07
Prob.	--	--	--	--	--	--	--
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.43 -	1.20 -	1.19 -	1.20 -	22.10 -	7.00 NV	33.40 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	--	--
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	2 Pass	2 Pass	2 Pass	1 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

MDC Corrected

Table A-20 CU A1PII-S1-19 Summary Statistics

Area 1 Phase II Certification Statistics

	RADIONUCLIDES					METALS	
Station Number	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1PII-S1-19-01	1.12 -	0.93 -	0.91 -	0.93 -	11.30 -	23.10 NV	27.60 NV
A1PII-S1-19-02	1.23 -	1.15 -	1.10 -	1.15 -	31.80 -	4.40 NV	21.50 NV
A1PII-S1-19-03	1.17 -	1.08 -	1.05 -	1.08 -	21.50 -	7.20 NV	18.60 NV
A1PII-S1-19-04	1.19 -	1.17 -	1.13 -	1.17 -	15.30 -	6.70 NV	23.10 NV
A1PII-S1-19-05	1.15 -	1.00 -	0.97 -	1.00 -	13.10 -	9.30 NV	22.90 NV
A1PII-S1-19-06	1.12 -	1.04 -	1.02 -	1.04 -	15.00 -	2.80 NV	22.30 NV
A1PII-S1-19-07-D	1.06 -	1.08 -	1.07 -	1.08 -	18.50 -	8.60 NV	34.90 NV
A1PII-S1-19-07	1.10 -	1.14 -	1.12 -	1.14 -	21.10 -	5.80 NV	74.30 NV
A1PII-S1-19-08	1.10 -	1.01 -	1.00 -	1.01 -	14.50 -	5.50 NV	23.10 NV
A1PII-S1-19-09	1.11 -	1.02 -	1.03 -	1.02 -	13.50 -	4.00 NV	40.20 NV
A1PII-S1-19-10	1.20 -	1.04 -	1.00 -	1.04 -	9.77 -	37.10 NV	1152.00 NV
A1PII-S1-19-11	1.21 -	1.12 -	1.09 -	1.12 -	14.20 -	3.10 NV	14.80 NV
A1PII-S1-19-12	1.27 -	1.09 -	1.08 -	1.09 -	10.60 -	6.90 NV	24.90 NV
A1PII-S1-19-13	0.87 -	0.83 J	0.81 -	0.83 -	18.70 -	5.10 NV	6.70 NV
A1PII-S1-19-14	1.07 -	0.87 J	0.86 -	0.87 -	6.94 -	10.40 NV	20.50 NV
A1PII-S1-19-15	1.11 -	1.00 -	0.98 -	1.00 -	21.60 -	4.30 NV	23.40 NV
A1PII-S1-19-16	1.09 -	1.01 -	0.97 -	1.01 -	18.10 -	4.91 NV	54.10 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%
W-statistic Prob. #	2.5% (N)	46.9% (N)	38.6% (N)	46.9% (N)	96.7% (LN)	7.8% (LN)	0.0% (LN)
Test Procedure	Wilcoxon	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (LN)	t-Test (LN)	Median
Sample Size	16	16	16	16	16	16	16
Est. Mean*	1.12	1.03	1.01	1.03	16.14	8.61	23.10
UCL	- -	1.07	1.05	1.07	19.39	11.56	27.60
Prob.	0.024%	- -	- -	- -	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.27 -	1.17 -	1.13 -	1.17 -	31.80 -	37.10 NV	1152.00 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -	- -
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	2 Pass	2 Pass	8 Pass	4 Pass

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

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

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Table A-21 CU A1PII-S3-CD Summary Statistics

Area 1 Phase II Certification Statistics

	RADIONUCLIDES					METALS
Station Number	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1PII-CD-01-01	1.02 -	0.99 -	0.98 J	0.99 -	5.70 UJ	3.30 NV
A1PII-CD-01-02	1.99 -	1.65 -	1.57 -	1.65 -	102.00 -	8.00 NV
A1PII-CD-01-03	1.43 -	1.22 -	1.21 -	1.22 -	6.30 UJ	8.20 NV
A1PII-CD-01-03-D	1.44 -	1.32 -	1.31 -	1.32 -	4.70 J	12.00 NV
A1PII-CD-01-04	1.17 -	1.23 -	1.18 -	1.23 -	10.90 -	3.10 NV
A1PII-CD-01-05	0.77 -	0.76 -	0.74 J	0.76 -	8.50 UJ	4.90 NV
A1PII-CD-01-06	1.29 -	1.36 -	1.31 -	1.36 -	22.00 -	5.50 NV
A1PII-CD-01-07	1.29 -	1.27 -	1.22 -	1.27 -	29.30 -	2.90 NV
A1PII-CD-01-08	1.18 -	1.17 -	1.16 -	1.17 -	28.20 -	6.80 NV
A1PII-CD-01-09	1.16 -	1.16 -	1.14 -	1.16 -	26.60 -	7.40 NV
A1PII-CD-01-10	1.08 -	1.35 -	1.33 -	1.35 -	51.20 -	4.30 NV
A1PII-CD-01-11	1.22 -	1.17 -	1.13 -	1.17 -	51.20 -	5.10 NV
A1PII-CD-01-12	1.37 -	1.32 -	1.30 -	1.32 -	15.90 -	3.70 NV
A1PII-CD-01-13	1.04 -	1.10 -	1.05 J	1.10 -	6.30 UJ	6.10 NV
A1PII-CD-01-14	1.20 -	1.18 -	1.15 -	1.18 -	8.13 -	6.50 NV
A1PII-CD-01-15	1.21 -	1.16 -	1.14 -	1.16 -	14.50 -	5.00 NV
A1PII-CD-01-16	1.34 -	1.22 -	1.26 -	1.22 -	40.70 -	6.20 NV
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	13.8% (LN)	18.3% (N)	26.7% (N)	18.3% (N)	59.2% (LN)	84.4% (LN)
Test Procedure	t-Test (LN)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (LN)	t-Test (LN)
Sample Size	16	16	16	16	16	16
Est. Mean*	1.24	1.21	1.19	1.21	28.80	5.69
UCL	1.36	1.30	1.26	1.30	63.58	6.56
Prob.	- -	- -	- -	- -	- -	- -
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.99 -	1.65 -	1.57 -	1.65 -	102.00 -	12.00 NV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample	4	2	3	5	5	2
Size calculation	Pass	Pass	Pass	Pass	Pass	Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valida

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

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Table A-22 CU A1PII-S2-2a-01 Summary Statistics without Additional Samples

Area 1 Phase II Certification Statistics (original 16 samples)

	RADIONUCLIDES					METALS		PCBs
Station Number	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Beryllium	Aroclor-1260
A1PII-S2-2A-01-01	1.21 -	1.31 -	1.30 UJ	1.31 -	5.80 UJ	10.30 NV	0.51 NV	40.00 UNV
A1PII-S2-2A-01-01-D	1.21 -	1.26 -	1.28 UJ	1.26 -	6.00 UJ	10.10 NV	0.42 NV	41.00 UNV
A1PII-S2-2A-01-02	1.19 -	1.20 -	1.20 J	1.20 -	19.80 J	12.40 NV	0.58 NV	43.00 UNV
A1PII-S2-2A-01-03	1.17 -	1.25 -	1.24 UJ	1.25 -	6.10 UJ	12.40 NV	0.42 NV	41.00 UNV
A1PII-S2-2A-01-04	1.23 -	1.24 -	1.22 J	1.24 -	15.30 J	7.90 NV	0.65 NV	43.00 UNV
A1PII-S2-2A-01-05	1.14 -	1.15 -	1.14 J	1.15 -	9.36 J	10.40 NV	0.52 NV	39.00 UNV
A1PII-S2-2A-01-06	1.50 -	1.29 -	1.28 J	1.29 -	6.17 J	8.60 NV	0.83 NV	43.00 UNV
A1PII-S2-2A-01-07	0.91 -	0.96 -	0.92 UJ	0.96 -	5.50 UJ	9.20 NV	0.50 NV	45.00 UNV
A1PII-S2-2A-01-08	1.24 -	1.27 -	1.25 J	1.27 -	22.80 J	11.20 NV	0.51 NV	46.00 UNV
A1PII-S2-2A-01-09	1.24 -	1.36 -	1.37 UJ	1.36 -	5.00 UJ	8.10 NV	0.50 NV	42.00 UNV
A1PII-S2-2A-01-10	1.22 -	1.35 -	1.36 UJ	1.35 -	5.00 UJ	7.90 NV	0.43 NV	42.00 UNV
A1PII-S2-2A-01-11	1.24 -	1.38 -	1.36 UJ	1.38 -	5.90 UJ	9.70 NV	0.48 NV	43.00 UNV
A1PII-S2-2A-01-12	1.24 NV	1.30 NV	1.34 UNV	1.30 NV	5.07 UNV	11.90 NV	0.45 NV	44.00 UNV
A1PII-S2-2A-01-13	0.85 -	0.90 -	0.87 UJ	0.90 -	4.90 UJ	12.60 NV	0.68 NV	42.00 UNV
A1PII-S2-2A-01-14	1.13 -	1.25 -	1.27 J	1.25 -	7.30 J	7.50 NV	0.50 NV	43.00 UNV
A1PII-S2-2A-01-15	1.38 -	1.30 -	1.32 UJ	1.30 -	6.50 UJ	6.70 NV	0.62 NV	44.00 UNV
A1PII-S2-2A-01-16	1.36 -	1.43 -	1.46 J	1.43 -	11.00 J	9.20 NV	0.83 NV	41.00 UNV
FRL	1.70	1.80	1.70	1.50	82.00	12.00	1.50	130.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg	ug/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
W-statistic Prob. #	6.8% (N)	1.2% (N)	1.5% (N)	1.2% (N)	not tested	44.6% (LN)	8.1% (LN)	not tested
Test Procedure	t-Test (N)	Wilcoxon	Wilcoxon	Wilcoxon	Proportions	t-Test (LN)	t-Test (LN)	Proportions
Sample Size	16	16	16	16	16	16	16	16
Est. Mean*	1.20	1.28	1.28	1.28	6.17 J	9.76	0.56	0
UCL	1.27	--	--	--	--	10.47	0.61	--
Prob.	--	0.024%	0.024%	0.024%	0.009%	--	--	0.009%
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.50 -	1.43 -	1.46 J	1.43 -	22.80 J	12.60 NV	0.83 NV	46.00 UNV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	--	--	--
a posteriori Sample Size calculation	2 Pass	3 Pass	3 Pass	4 Pass	3 Pass	5 Pass	2 Pass	2 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

MDC Corrected

000078

Table A-22a CU A1PII-S2-2a-01 Summary Statistics with Additional Samples

Area 1 Phase II Certification Statistics

	RADIONUCLIDES					METALS		PCBs
Station Number	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Beryllium	Aroclor-1260
A1PII-S2-2A-01-01	1.21 -	1.31 -	1.30 UJ	1.31 -	5.80 UJ	10.30 NV	0.51 NV	40.00 UNV
A1PII-S2-2A-01-01-D	1.21 -	1.26 -	1.28 UJ	1.26 -	6.00 UJ	10.10 NV	0.42 NV	41.00 UNV
A1PII-S2-2A-01-02	1.19 -	1.20 -	1.20 J	1.20 -	19.80 J	12.40 NV	0.58 NV	43.00 UNV
A1PII-S2-2A-01-03	1.17 -	1.25 -	1.24 UJ	1.25 -	6.10 UJ	12.40 NV	0.42 NV	41.00 UNV
A1PII-S2-2A-01-04	1.23 -	1.24 -	1.22 J	1.24 -	15.30 J	7.90 NV	0.65 NV	43.00 UNV
A1PII-S2-2A-01-05	1.14 -	1.15 -	1.14 J	1.15 -	9.36 J	10.40 NV	0.52 NV	39.00 UNV
A1PII-S2-2A-01-06	1.50 -	1.29 -	1.28 J	1.29 -	6.17 J	8.60 NV	0.83 NV	43.00 UNV
A1PII-S2-2A-01-07	0.91 -	0.96 -	0.92 UJ	0.96 -	5.50 UJ	9.20 NV	0.50 NV	45.00 UNV
A1PII-S2-2A-01-08	1.24 -	1.27 -	1.25 J	1.27 -	22.80 J	11.20 NV	0.51 NV	46.00 UNV
A1PII-S2-2A-01-09	1.24 -	1.36 -	1.37 UJ	1.36 -	5.00 UJ	8.10 NV	0.50 NV	42.00 UNV
A1PII-S2-2A-01-10	1.22 -	1.35 -	1.36 UJ	1.35 -	5.00 UJ	7.90 NV	0.43 NV	42.00 UNV
A1PII-S2-2A-01-11	1.24 -	1.38 -	1.36 UJ	1.38 -	5.90 UJ	9.70 NV	0.48 NV	43.00 UNV
A1PII-S2-2A-01-12	1.24 NV	1.30 NV	1.34 UNV	1.30 NV	5.07 UNV	11.90 NV	0.45 NV	44.00 UNV
A1PII-S2-2A-01-13	0.85 -	0.90 -	0.87 UJ	0.90 -	4.90 UJ	12.60 NV	0.68 NV	42.00 UNV
A1PII-S2-2A-01-14	1.13 -	1.25 -	1.27 J	1.25 -	7.30 J	7.50 NV	0.50 NV	43.00 UNV
A1PII-S2-2A-01-15	1.38 -	1.30 -	1.32 UJ	1.30 -	6.50 UJ	6.70 NV	0.62 NV	44.00 UNV
A1PII-S2-2A-01-16	1.36 -	1.43 -	1.46 J	1.43 -	11.00 J	9.20 NV	0.83 NV	41.00 UNV
A1PII-S2-2A-01-17	1.27 -	1.20 -	1.20 -	1.20 -	15.26 -	6.90 NV	0.61 NV	42.00 UNV
A1PII-S2-2A-01-18	1.07 -	1.04 -	1.06 -	1.04 -	15.03 -	4.80 NV	0.49 NV	42.00 UNV
A1PII-S2-2A-01-19	1.29 -	1.20 -	1.21 -	1.21 -	9.57 -	5.80 NV	0.65 NV	41.00 UNV
FRL	1.70	1.80	1.70	1.50	82.00	12.00	1.50	130.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg	ug/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
W-statistic Prob. #	12.8% (N)	5.5% (N)	5.6% (N)	5.1% (N)	not tested	61.8% (N)	11.5% (LN)	not tested
Test Procedure	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)	Proportions	t-Test (N)	t-Test (LN)	Proportions
Sample Size	19	19	19	19	19	19	19	19
Est. Mean*	1.20	1.23	1.23	1.23	6.17 J	9.13	0.57	42.00 UNV
UCL	1.26	1.29	1.29	1.29	- -	9.84	0.60	- -
Prob.	- -	- -	- -	- -	0.0%	- -	- -	0.002%
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.50 -	1.43 -	1.46 J	1.43 -	22.80 J	12.60 NV	0.83 NV	46.00 UNV
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -	- -	- -
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	3 Pass	3 Pass	4 Pass	2 Pass	2 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

MDC Corrected

3266

000079

Table A-23. CU A1PII-S2-2a-02 Summary Statistics

Area 1 Phase II Certification Statistics

	RADIONUCLIDES					METALS		PCBs
Station Number	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Beryllium	Aroclor-1260
A1PII-S2-2A-02-01	1.33 -	1.39 -	1.38 -	1.39 -	47.10 -	5.10 -	0.47 -	47.00 U
A1PII-S2-2A-02-02-D	1.25 -	1.39 -	1.35 -	1.39 -	49.30 -	8.20 J	0.57 -	46.00 U
A1PII-S2-2A-02-02	1.27 -	1.37 -	1.35 -	1.37 -	45.60 -	8.10 -	0.53 -	46.00 U
A1PII-S2-2A-02-03	1.33 -	1.47 -	1.47 -	1.47 -	52.60 -	6.60 -	0.57 -	44.00 U
A1PII-S2-2A-02-04	1.34 -	1.53 -	1.52 -	1.53 -	62.90 -	5.20 -	0.42 -	51.00 U
A1PII-S2-2A-02-05	1.26 -	1.49 -	1.46 -	1.49 -	45.00 -	4.20 J	0.56 -	52.00 U
A1PII-S2-2A-02-06	1.28 -	1.41 -	1.42 -	1.41 -	52.20 -	5.10 J	0.49 -	43.00 U
A1PII-S2-2A-02-07	1.17 -	1.17 -	1.16 -	1.17 -	9.43 -	9.70 -	0.96 -	43.00 U
A1PII-S2-2A-02-08	1.25 -	1.44 -	1.44 -	1.44 -	60.90 -	7.10 -	0.37 -	46.00 U
A1PII-S2-2A-02-09	1.39 -	1.26 -	1.24 -	1.26 -	6.94 -	8.60 J	0.91 -	43.00 U
A1PII-S2-2A-02-10	1.27 -	1.33 -	1.32 -	1.33 -	17.90 -	8.60 -	0.57 -	39.00 U
A1PII-S2-2A-02-11	1.30 -	1.27 -	1.26 -	1.27 -	11.00 -	8.40 -	0.58 -	42.00 U
A1PII-S2-2A-02-12	1.28 -	1.39 -	1.37 -	1.39 -	49.50 -	4.90 J	0.33 -	45.00 U
A1PII-S2-2A-02-13	1.35 -	1.39 -	1.36 -	1.39 -	43.10 -	6.30 J	0.53 -	43.00 U
A1PII-S2-2A-02-14	1.26 -	1.31 -	1.29 -	1.31 -	34.40 -	5.20 J	0.47 -	42.00 U
A1PII-S2-2A-02-15	1.42 -	1.54 -	1.54 -	1.54 -	41.90 -	4.20 J	0.47 -	54.00 U
A1PII-S2-2A-02-16	1.17 -	1.32 -	1.32 -	1.32 -	38.00 -	6.50 J	0.38 -	50.00 U
FRL	1.70	1.80	1.70	1.50	82.00	12.00	1.50	130.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg	mg/kg	ug/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
W-statistic Prob. #	53.9% (N)	83.9% (N)	98.5% (N)	83.9% (N)	5.5% (N)	24.2% (LN)	12.9% (LN)	not tested
Test Procedure	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (LN)	t-Test (LN)	Proportions
Sample Size	16	16	16	16	16	16	16	16
Est. Mean*	1.29	1.38	1.37	1.38	38.89	6.51	0.54	22.25
UCL	1.32	1.43	1.41	1.43	46.81	7.18	0.60	- -
Prob.	- -	- -	- -	- -	- -	- -	- -	0.009%
Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Max Result	1.42 -	1.54 -	1.54 -	1.54 -	62.90 -	9.70 -	0.96 -	54.00 U
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -	- -	- -
a posteriori Sample Size calculation	2 Pass	2 Pass	2 Pass	6 Pass	3 Pass	2 Pass	2 Pass	2 Pass

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not valid

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
Results reported below the MDC were corrected to: "<MDC value> UJ"

* - The median (Est. Mean) for Aroclor-1260 is the average of the 8th and 9th ranked sample results. These two values are "44 U" (..-03) and "45 U" (..-12), the "U" was carried fo
The maximum value of the two duplicates was used in all statistical equations.

#: This 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.

MDC Corrected

000080

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

3266

CU A1PII-S2B-NAR1
CU A1PII-S2B-NAR2
CU A1PII-S2B-NAR3
CU A1PII-EIS

Area 1 Phase II Sector 2B Certification Statistics

	RADIONUCLIDES					METALS
Station Number	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1P2S2B-NAR1-01	1.52 -	1.22 -	1.19 -	1.22 -	4.47 J	4.63 -
A1P2S2B-NAR1-03	1.31 -	1.12 -	1.13 -	1.12 -	4.41 U	7.15 -
A1P2S2B-NAR1-03-D	1.20 -	1.12 -	1.09 -	1.12 -	4.83 J	6.28 -
A1P2S2B-NAR1-04	1.29 -	1.23 -	1.23 -	1.23 -	4.48 U	10.50 -
A1P2S2B-NAR1-05	1.55 -	1.18 -	1.19 -	1.18 -	4.33 U	5.50 -
A1P2S2B-NAR1-06	1.46 -	1.09 -	1.09 -	1.09 -	4.59 U	6.40 -
A1P2S2B-NAR1-07	1.69 -	1.12 -	1.13 -	1.12 -	4.43 U	4.90 -
A1P2S2B-NAR1-09	1.34 -	1.15 -	1.17 -	1.15 -	4.45 U	2.98 -
A1P2S2B-NAR1-11	1.07 -	0.80 -	0.81 -	0.80 -	3.63 J	3.82 -
A1P2S2B-NAR1-12	0.80 -	0.67 -	0.65 -	0.67 -	3.97 U	3.77 -
A1P2S2B-NAR1-13	0.80 -	0.67 -	0.69 -	0.67 -	3.92 U	3.78 -
A1P2S2B-NAR1-14	1.00 -	0.70 -	0.73 -	0.70 -	4.03 U	3.84 -
A1P2S2B-NAR1-15	1.59 -	0.84 -	0.85 -	0.84 -	3.50 J	4.73 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	30.7% (N)	2.3% (N)	2.7% (N)	2.3% (N)	not tested	35.2% (LN)
Test Procedure	t-Test (N)	Wilcoxon	Wilcoxon	Wilcoxon	Proportions	t-Test (LN)
Sample Size	12	12	12	12	12	12
Est. Mean*	1.28	1.11	1.11	1.11	2.22	5.17
UCL	--	--	--	--	--	--
Prob.	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--
Max Result	1.69 -	1.23 -	1.23 -	1.23 -	4.83 J	10.50 -
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	--
a posteriori Sample Size calculation	5 Pass	3 Pass	3 Pass	3 Pass	3 Pass	2 Pass

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

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

Area 1 Phase II Sector 2B Certification Statistics

Station Number	RADIONUCLIDES					METALS
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1P2S2B-NAR2-01	1.43 -	1.28 -	1.30 -	1.28 -	4.97 J	8.95 -
A1P2S2B-NAR2-02	1.45 -	1.17 -	1.13 -	1.17 -	3.16 U	5.30 -
A1P2S2B-NAR2-03	1.37 -	1.00 -	0.98 -	1.00 -	4.16 J	8.16 -
A1P2S2B-NAR2-05	1.48 -	1.24 -	1.21 -	1.24 -	3.89 U	3.89 -
A1P2S2B-NAR2-07	1.47 -	1.06 -	1.02 -	1.06 -	3.80 U	6.80 -
A1P2S2B-NAR2-08	1.12 -	0.96 -	0.95 -	0.96 -	6.03 J	5.29 -
A1P2S2B-NAR2-10	0.98 -	0.83 -	0.84 -	0.83 -	4.97 J	6.78 -
A1P2S2B-NAR2-10-D	1.01 -	0.91 -	0.90 -	0.91 -	3.30 U	8.14 -
A1P2S2B-NAR2-11	0.90 -	0.72 -	0.73 -	0.72 -	3.30 U	6.27 -
A1P2S2B-NAR2-12	1.34 -	0.94 -	0.91 -	0.94 -	3.61 J	7.94 -
A1P2S2B-NAR2-14	1.24 -	1.18 -	1.17 -	1.18 -	3.88 U	3.27 -
A1P2S2B-NAR2-15	0.99 -	0.76 -	0.75 -	0.76 -	7.40 U	4.84 -
A1P2S2B-NAR2-16	1.04 -	0.83 -	0.80 -	0.83 -	3.60 U	6.68 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	11.4% (N)	57.2% (N)	78.3% (LN)	57.2% (N)	not tested	91.0% (N)
Test Procedure	t-Test (N)	t-Test (N)	t-Test (LN)	t-Test (N)	Proportions	t-Test (N)
Sample Size	12	12	12	12	12	12
Est. Mean*	1.23	1.00	0.98	1.00	2.78	6.18
UCL	- -	- -	- -	- -	- -	- -
Prob.	- -	- -	- -	- -	- -	- -
Pass / Fail	- -	- -	- -	- -	- -	- -
Max Result	1.48 -	1.28 -	1.30 -	1.28 -	6.03 J *	8.95 -
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	- -
a posteriori Sample Size calculation	3 Pass	2 Pass	3 Pass	3 Pass	3 Pass	2 Pass

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

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.
* "6.03 J" is reported as the maximum value because "7.40 U" is assumed to be "3.70" (½ the Detection Limit).

E0063

Area 1 Phase II Sector 2B Certification Statistics

	RADIONUCLIDES					METALS
Station Number	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1P2S2B-NAR3-01	0.51 -	0.33 J	0.30 -	0.33 J	3.38 U	1.99 -
A1P2S2B-NAR3-01-D	0.41 -	0.28 J	0.26 -	0.28 J	3.43 U	1.62 -
A1P2S2B-NAR3-02	0.55 -	0.25 J	0.25 -	0.25 J	3.42 U	1.38 -
A1P2S2B-NAR3-03	0.52 -	0.27 J	0.27 -	0.27 J	3.22 U	2.27 -
A1P2S2B-NAR3-04	0.44 -	0.20 J	0.20 -	0.20 J	3.35 U	2.23 -
A1P2S2B-NAR3-05	0.94 -	1.13 J	1.13 -	1.13 J	21.56 -	8.14 -
A1P2S2B-NAR3-06	0.98 -	0.85 J	0.82 -	0.85 J	19.79 -	2.76 -
A1P2S2B-NAR3-07	1.08 -	1.00 J	0.98 -	1.00 J	37.79 -	2.82 -
A1P2S2B-NAR3-08	1.17 -	0.91 J	0.90 -	0.91 J	11.27 -	7.35 -
A1P2S2B-NAR3-09	1.03 -	0.84 J	0.85 -	0.84 J	17.52 -	5.99 -
A1P2S2B-NAR3-10	1.36 -	1.18 J	1.14 -	1.18 J	10.46 -	5.59 -
A1P2S2B-NAR3-11	1.28 -	1.05 J	1.08 -	1.05 J	26.66 -	3.08 -
A1P2S2B-NAR3-12	1.17 -	0.88 J	0.88 -	0.88 J	11.33 -	4.27 -
A1P2S2B-NAR3-13	1.10 -	0.71 J	0.65 -	0.71 J	9.03 -	3.00 -
A1P2S2B-NAR3-14	1.03 -	0.80 J	0.75 -	0.80 J	14.52 J	4.65 -
A1P2S2B-NAR3-15	1.05 -	0.63 J	0.61 -	0.63 J	5.58 -	2.31 -
A1P2S2B-NAR3-16	1.24 -	1.28 J	1.26 -	1.28 J	17.75 -	3.43 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	2.9% (N)	18.9% (N)	19.1% (N)	18.9% (N)	16.7% (N)	75.7% (LN)
Test Procedure	Wilcoxon	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (N)	t-Test (LN)
Sample Size	16	16	16	16	16	16
Est. Mean*	1.04	0.77	0.75	0.77	13.12	3.85
UCL	--	--	--	--	--	--
Prob.	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--
Max Result	1.36 -	1.28 J	1.26 -	1.28 J	37.79 -	8.14 -
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	--
a posteriori Sample Size calculation	3 Pass	3 Pass	3 Pass	3 Pass	2 Pass	2 Pass

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

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

000084

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Area 1 Phase II Sector 2B Certification Statistics

	RADIONUCLIDES					METALS
Station Number	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic
A1P2S2B-EIS-01	1.32 -	1.14 -	1.12 -	1.14 -	10.04 -	3.41 -
A1P2S2B-EIS-02	1.09 -	1.08 -	1.06 -	1.08 -	16.82 -	2.05 -
A1P2S2B-EIS-03	1.14 -	1.16 -	1.14 -	1.16 -	19.33 -	0.63 -
A1P2S2B-EIS-06	1.14 -	1.10 -	1.09 -	1.10 -	12.40 -	3.36 -
A1P2S2B-EIS-06-D	1.01 -	1.08 -	1.06 -	1.08 -	11.12 -	3.60 -
A1P2S2B-EIS-07	1.10 -	1.07 -	1.05 -	1.07 -	9.15 -	3.15 -
A1P2S2B-EIS-08	0.95 J	1.12 -	1.12 -	1.12 -	14.69 -	3.11 -
A1P2S2B-EIS-09	1.37 -	1.13 -	1.10 -	1.13 -	16.12 -	4.37 -
A1P2S2B-EIS-10	1.51 -	1.15 -	1.11 -	1.15 -	17.05 -	3.48 -
A1P2S2B-EIS-11	1.50 -	1.18 -	1.19 -	1.18 -	18.05 -	4.56 -
A1P2S2B-EIS-13	1.27 -	1.11 -	1.10 -	1.11 -	18.80 -	3.19 -
A1P2S2B-EIS-15	1.26 -	1.10 -	1.05 -	1.10 -	17.86 -	3.28 -
A1P2S2B-EIS-16	1.29 -	1.19 -	1.20 -	1.19 -	17.04 -	3.76 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%
W-statistic Prob. #	75.0% (N)	86.1% (LN)	36.3% (LN)	86.1% (LN)	6.2% (N)	3.4% (N)
Test Procedure	t-Test (N)	t-Test (LN)	t-Test (LN)	t-Test (LN)	t-Test (N)	Wilcoxon
Sample Size	12	12	12	12	12	12
Est. Mean*	1.24	1.13	1.11	1.13	15.61	3.32
UCL	--	--	--	--	--	--
Prob.	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--
Max Result	1.51 -	1.19 -	1.20 -	1.19 -	19.33 -	4.56 -
2x Rule P/F	Pass	Pass	Pass	Pass	Pass	--
a posteriori Sample Size calculation	3 Pass	2 Pass	2 Pass	2 Pass	2 Pass	2 Pass

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

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.
#: This 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.

580085

CERTIFICATION STATISTICS FOR THE CERTIFICATION DESIGN LETTER FOR AREA 1, PHASE II SECTOR 3 UTILITY TRENCHES

CU A1PII-S3UT-01
CU A1PII-S3UT-02
CU A1PII-S3UT-03
CU A1PII-S3UT-04
CU A1PII-S3UT-05

Appendix A: Certification Statistics for A1PII-S3UT-01

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Beryllium
A1PII-S3UT-01-01-RM	0.62 J	0.40 J	0.38 J	0.40 J	3.12 U	1.11 U	0.46 -
A1PII-S3UT-01-01-RM-D	0.85 J	0.64 J	0.65 J	0.64 J	4.10 J	1.10 U	0.54 -
A1PII-S3UT-01-02-RM	0.87 -	0.65 -	0.65 -	0.65 -	3.35 U	1.57 U	0.74 -
A1PII-S3UT-01-03-RM	0.91 -	0.60 -	0.60 -	0.60 -	3.21 U	1.16 U	0.73 -
A1PII-S3UT-01-04-RM	1.01 -	0.97 -	0.97 -	0.97 -	5.21 -	1.32 U	0.44 -
A1PII-S3UT-01-05-RM	0.81 -	0.72 -	0.71 -	0.72 -	3.17 U	1.14 U	0.23 -
A1PII-S3UT-01-06-RM	0.87 -	0.75 -	0.72 -	0.75 -	4.61 -	0.99 U	0.21 -
A1PII-S3UT-01-07-RM	0.83 -	0.65 -	0.63 -	0.65 -	3.72 J	0.92 U	0.30 -
A1PII-S3UT-01-08-RM	0.83 -	0.73 -	0.74 -	0.73 -	2.71 U	0.87 U	0.43 -
A1PII-S3UT-01-09-RM	0.95 -	0.84 -	0.83 -	0.84 -	3.48 U	0.99 U	0.38 -
A1PII-S3UT-01-10-RM	0.93 -	0.71 -	0.70 -	0.71 -	3.46 J	0.88 U	0.41 -
A1PII-S3UT-01-11-RM	1.02 -	0.88 -	0.86 -	0.88 -	5.76 -	1.02 U	0.64 -
A1PII-S3UT-01-12-RM	1.27 -	1.08 -	1.07 -	1.08 -	7.18 -	0.86 U	0.60 -
A1PII-S3UT-01-13-RM	1.02 -	0.86 -	0.86 -	0.86 -	6.77 -	1.18 UJ	0.29 -
A1PII-S3UT-01-14-RM	0.81 -	0.59 -	0.59 -	0.59 -	3.33 U	1.18 UJ	0.12 -
A1PII-S3UT-01-15-RM	1.30 -	1.03 -	1.03 -	1.03 -	3.96 J	1.48 U	0.46 -
A1PII-S3UT-01-16-RM	1.40 -	1.03 -	1.04 -	1.03 -	15.40 -	0.95 U	0.40 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	1.50
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.40 @	1.08 @	1.07 @	1.08 @	15.40 @	1.57 U @	0.74 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	16	16	16	16	16	16	16
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

000087

Appendix A: Certification Statistics for A1PII-S3UT-02

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Beryllium
A1PII-S3UT-02-01-RM	0.75 -	0.58 -	0.57 -	0.58 -	3.12 U	1.13 U	0.69 -
A1PII-S3UT-02-02-RM	0.98 -	0.91 -	0.90 -	0.91 -	5.67 J	1.22 U	0.98 -
A1PII-S3UT-02-03-RM	0.80 -	0.74 -	0.73 -	0.74 -	3.14 J	1.25 U	0.86 -
A1PII-S3UT-02-04-RM	1.30 -	0.99 -	0.97 -	0.99 -	5.76 -	1.57 U	0.58 -
A1PII-S3UT-02-05-RM	0.78 -	0.72 -	0.71 -	0.72 -	3.33 U	1.05 U	0.18 -
A1PII-S3UT-02-06-RM	0.78 -	0.75 -	0.72 -	0.75 -	3.21 U	1.07 U	0.26 -
A1PII-S3UT-02-07-RM	0.84 -	0.84 -	0.84 -	0.84 -	4.31 J	1.11 U	0.22 -
A1PII-S3UT-02-08-RM	0.77 -	0.65 -	0.62 -	0.65 -	3.31 U	0.99 U	0.22 -
A1PII-S3UT-02-09-RM	0.71 -	0.57 -	0.57 -	0.57 -	3.09 U	1.14 U	0.07 U
A1PII-S3UT-02-10-RM	0.80 -	0.65 -	0.63 -	0.65 -	3.31 U	1.08 U	0.13 -
A1PII-S3UT-02-11-RM	0.84 -	0.72 -	0.70 -	0.72 -	3.39 U	1.07 U	0.42 -
A1PII-S3UT-02-12-RM	0.82 -	0.72 -	0.73 -	0.72 -	3.33 U	1.10 U	0.09 -
A1PII-S3UT-02-12-RM-D	0.88 -	0.72 -	0.68 -	0.72 -	3.42 J	1.01 U	0.12 -
A1PII-S3UT-02-13-RM	0.95 -	0.69 -	0.68 -	0.69 -	3.40 U	1.04 U	0.20 -
A1PII-S3UT-02-14-RM	0.95 -	0.60 -	0.62 -	0.60 -	3.33 U	1.45 UJ	0.20 -
A1PII-S3UT-02-15-RM	1.31 -	0.99 -	0.97 -	0.99 -	8.27 -	1.10 U	0.15 -
A1PII-S3UT-02-16-RM	0.84 -	0.77 -	0.76 -	0.77 -	4.36 J	1.20 U	0.28 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	1.50
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.31 @	0.99 @	0.97 @	0.99 @	8.27 @	1.57 U @	0.98 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	16	16	16	16	16	16	16
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1PII-S3UT-03

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Beryllium
A1PII-S3UT-03-01A-RM	1.06 -	0.87 -	0.89 -	0.88 -	4.87 -	1.36 U	0.38 -
A1PII-S3UT-03-02-RM	1.18 -	1.17 -	1.15 -	1.17 -	3.75 U	0.80 J	0.69 J
A1PII-S3UT-03-03-RM	0.89 -	0.75 -	0.77 -	0.75 -	3.46 U	0.76 U	0.55 J
A1PII-S3UT-03-04-RM	1.24 -	1.13 -	1.12 -	1.13 -	9.43 -	0.97 J	0.67 J
A1PII-S3UT-03-05-RM	1.24 -	1.20 -	1.18 -	1.20 -	3.80 U	1.09 J	0.79 J
A1PII-S3UT-03-06-RM	1.26 -	1.05 -	1.01 -	1.05 -	3.59 U	0.83 U	0.72 J
A1PII-S3UT-03-07-RM	1.00 -	0.78 -	0.79 -	0.78 -	3.52 U	1.02 UJ	0.16 -
A1PII-S3UT-03-07-RM-D	0.88 -	0.80 -	0.80 -	0.80 -	3.42 U	1.01 UJ	0.09 -
A1PII-S3UT-03-08-RM	0.85 -	0.70 -	0.71 -	0.70 -	3.33 U	1.07 UJ	0.09 -
A1PII-S3UT-03-09-RM	0.93 -	0.63 -	0.65 -	0.63 -	3.32 U	1.06 UJ	0.12 -
A1PII-S3UT-03-10-RM	1.04 -	0.81 -	0.80 -	0.81 -	3.39 U	1.11 UJ	0.21 -
A1PII-S3UT-03-11-RM	1.03 -	0.81 -	0.81 -	0.81 -	3.44 U	1.08 UJ	0.08 U
A1PII-S3UT-03-12-RM	0.99 -	0.83 -	0.83 -	0.83 -	3.52 U	0.91 U	0.48 J
A1PII-S3UT-03-13-RM	1.05 -	1.00 -	0.99 -	1.00 -	3.52 U	0.90 U	0.54 J
A1PII-S3UT-03-14-RM	0.96 -	0.82 -	0.82 -	0.82 -	4.01 J	0.82 U	0.26 J
A1PII-S3UT-03-15-RM	0.66 -	0.63 -	0.63 -	0.63 -	3.26 U	1.05 UJ	0.13 -
A1PII-S3UT-03-16-RM	0.86 -	0.74 -	0.73 -	0.74 -	2.78 J	1.40 U	0.31 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	1.50
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.26 @	1.20 @	1.18 @	1.20 @	9.43 @	1.09 @	0.79 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	16	16	16	16	16	16	16
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1PII-S3UT-04

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Beryllium
A1PII-S3UT-04-01-RM	0.82 -	0.80 -	0.78 -	0.80 -	3.33 U	0.86 U	0.30 -
A1PII-S3UT-04-02-RM	1.02 -	0.89 -	0.88 -	0.89 -	3.46 U	0.93 U	0.62 -
A1PII-S3UT-04-03-RM	1.42 -	1.21 -	1.19 -	1.21 -	3.70 U	0.88 U	0.67 -
A1PII-S3UT-04-04-RM	1.43 -	1.21 -	1.18 -	1.21 -	8.40 -	0.95 U	0.82 -
A1PII-S3UT-04-05-RM	1.62 -	1.13 -	1.10 -	1.13 -	7.42 -	0.86 U	0.38 -
A1PII-S3UT-04-06-RM	1.69 -	1.19 -	1.19 -	1.19 -	3.89 U	1.00 U	0.31 J
A1PII-S3UT-04-06-RM-D	1.54 -	1.20 -	1.18 -	1.20 -	3.92 U	0.78 U	0.56 J
A1PII-S3UT-04-07-RM	1.48 -	1.18 -	1.13 -	1.18 -	8.30 -	0.89 U	0.50 -
A1PII-S3UT-04-08-RM	1.11 -	0.89 -	0.88 -	0.89 -	3.47 U	1.09 J	0.43 -
A1PII-S3UT-04-09-RM	0.92 -	0.77 -	0.78 -	0.77 -	3.40 U	0.87 U	0.37 -
A1PII-S3UT-04-10-RM	1.08 -	0.73 -	0.72 -	0.73 -	3.36 U	0.76 U	0.33 -
A1PII-S3UT-04-11-RM	1.38 -	1.08 -	1.03 -	1.08 -	3.88 J	1.03 J	0.57 -
A1PII-S3UT-04-12-RM	1.06 -	1.16 -	1.15 -	1.16 -	3.80 U	0.85 U	0.69 -
A1PII-S3UT-04-13-RM	1.62 -	1.05 -	1.03 -	1.05 -	3.78 U	0.87 U	0.74 -
A1PII-S3UT-04-14-RM	1.46 -	1.14 -	1.13 -	1.14 -	3.67 U	0.77 U	0.61 -
A1PII-S3UT-04-15-RM	0.96 -	0.57 -	0.56 -	0.57 -	3.25 U	0.93 U	0.17 -
A1PII-S3UT-04-16-RM	1.00 -	0.73 -	0.73 -	0.73 -	6.25 -	1.36 U	0.28 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	1.50
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.69 @	1.21 @	1.19 @	1.21 @	8.40 @	1.09 @	0.82 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	16	16	16	16	16	16	16
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1PII-S3UT-05

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Beryllium
A1PII-S3UT-05-01-RM	0.68 -	0.74 -	0.73 -	0.74 -	3.33 U	0.87 U	0.92 J
A1PII-S3UT-05-02-RM	1.35 -	0.94 -	0.95 -	0.94 -	6.97 -	2.18 -	0.39 J
A1PII-S3UT-05-03-RM	0.91 -	0.83 -	0.82 -	0.83 -	3.42 U	0.92 U	0.48 J
A1PII-S3UT-05-03-RM-D	0.88 -	0.80 -	0.77 -	0.80 -	3.49 U	0.97 U	0.46 J
A1PII-S3UT-05-04-RM	0.88 -	0.79 -	0.77 -	0.79 -	3.34 U	0.84 U	0.26 J
A1PII-S3UT-05-05-RM	0.82 -	0.63 -	0.62 -	0.63 -	3.33 U	0.76 U	0.35 J
A1PII-S3UT-05-06-RM	1.45 -	1.15 -	1.15 -	1.15 -	3.71 U	1.88 -	0.51 J
A1PII-S3UT-05-07-RM	1.18 -	0.78 -	0.78 -	0.78 -	3.45 U	0.95 U	0.52 J
A1PII-S3UT-05-08-RM	1.30 -	0.92 -	0.91 -	0.92 -	3.58 U	1.03 U	0.63 J
A1PII-S3UT-05-09-RM	1.26 -	1.04 -	1.02 -	1.04 -	7.04 -	1.05 U	0.53 J
A1PII-S3UT-05-10-RM	0.98 -	0.85 -	0.86 -	0.85 -	5.41 -	1.20 U	2.46 J
A1PII-S3UT-05-11-RM	1.31 -	1.15 -	1.14 -	1.15 -	5.15 J	1.13 U	1.70 J
A1PII-S3UT-05-12-RM	1.66 -	0.94 -	0.90 -	0.94 -	9.30 -	1.18 U	1.10 J
A1PII-S3UT-05-13-RM	1.07 -	0.92 -	0.89 -	0.92 -	4.30 J	1.32 U	1.14 J
A1PII-S3UT-05-14-RM	1.21 -	1.14 -	1.16 -	1.14 -	3.64 J	1.37 U	1.37 J
A1PII-S3UT-05-15-RM	1.26 -	1.01 -	0.98 -	1.01 -	5.66 -	1.17 U	0.91 J
A1PII-S3UT-05-16-RM	1.12 -	0.81 -	0.81 -	0.81 -	5.09 -	1.49 U	1.04 J
FRL	1.70	1.80	1.70	1.50	82.00	30.00	1.50
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.66 @	1.15 @	1.16 @	1.15 @	9.30 @	2.18 @	2.46
Standardized Skewness	--	--	--	--	--	--	1.760
W-Statistic Probability*	--	--	--	--	--	--	89.7% (LN)
Test Procedure	--	--	--	--	--	--	t-Test (LN)
Sample Size	16	16	16	16	16	16	16
Estimated Mean	--	--	--	--	--	--	0.90
UCL on the Mean**	--	--	--	--	--	--	1.28
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	Pass
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	7
Size calculation	--	--	--	--	--	--	Pass

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

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CERTIFICATION STATISTICS FOR THE CERTIFICATION DESIGN LETTER FOR AREA 1, PHASE II CERTIFIED FOR REUSE AREAS, TRAP RANGE, SECTOR 2C AND SECTOR 3

CUs East of the North Access Road

CU A1P2-S1OF-01
CU A1P2-S1SB-01
CU A1P2-S1SB-02
CU A1P2-S1TR-01
CU A1P2-S1TR-02
CU A1P2-S1TR-03
CU A1P2-S1TR-04
CU A1P2-S1TR-05
CU A1P2-S1TR-06
CU A1P2-S1TR-07
CU A1P2-S1TR-08
CU A1P2-S1TR-09
CU A1P2-S1TR-10
CU A1P2-S1TR-11
CU A1P2-S1TR-12
CU A1P2-S1TR-13
CU A1P2-S2HR-01
CU A1P2-S2NI-03
CU A1P2-S2NI-04
CU A1P2-S2NI-05
CU A1P2-S2NI-06
CU A1P2-S2SA-01
CU A1P2-S2SB-03
CU A1P2-S2SP-03
CU A1P2-S3CD-01
CU A1P2-S3CD-02
CU A1P2-S3DP-01
CU A1P2-S3DP-02
CU A1P2-S3HR-01
CU A1P2-S3HR-02
CU A1P2-S3HR-03
CU A1P2-S3HR-04
CU A1P2-S3HR-05
CU A1P2-S3HW-01
CU A1P2-S3NI-01
CU A1P2-S3NI-02
CU A1P2-S3NI-03
CU A1P2-S3NI-04
CU A1P2-S3NI-05
CU A1P2-S3NI-06
CU A1P2-S3NI-07

CERTIFICATION STATISTICS FOR THE
CERTIFICATION DESIGN LETTER FOR AREA 1, PHASE II
CERTIFIED FOR REUSE AREAS, TRAP RANGE, SECTOR 2C AND SECTOR 3
(Continued)

CUs East of the North Access Road (Continued)

CU A1P2-S3SA-01
CU A1P2-S3SA-02
CU A1P2-S3SA-03
CU A1P2-S3SA-04
CU A1P2-S3SA-05
CU A1P2-S3SA-06
CU A1P2-S3SA-07
CU A1P2-S3SA-08
CU A1P2-S3SA-09
CU A1P2-S3SA-09B
CU A1P2-S3SA-10
CU A1P2-S3SA-11
CU A1P2-S3SA-11B

CUs West of the North Access Road

CU A1P2-S2LL-01
CU A1P2-S2LL-02
CU A1P2-S2NI-01
CU A1P2-S2NI-02
CU A1P2-S2NI-07
CU A1P2-S2NI-08
CU A1P2-S2OS-01
CU A1P2-S2SB-01
CU A1P2-S2SB-02
CU A1P2-S2SB-04
CU A1P2-S2SP-01
CU A1P2-S2SP-02
CU A1P2-S2SP-04

Appendix A: Certification Statistics for A1P2-S1OF-01

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S1OF-01-01-RM	1.02 J	0.85 J	0.83 -	0.84 -	4.27 -	5.70 -	15.10 J
A1P2-S1OF-01-03-RM	0.93 J	0.67 J	0.68 -	0.67 -	3.02 -	6.90 -	14.50 J
A1P2-S1OF-01-04-RM	0.84 J	0.48 J	0.50 J	0.47 J	3.18 -	6.20 -	10.00 J
A1P2-S1OF-01-04-RM-D	0.79 J	0.59 J	0.61 J	0.58 J	2.93 -	6.00 -	10.00 J
A1P2-S1OF-01-05-RM	1.19 J	0.91 J	0.94 -	0.89 J	3.08 -	10.10 -	17.60 J
A1P2-S1OF-01-06-RM	0.89 J	0.68 J	0.69 -	0.66 -	2.96 -	5.10 -	11.00 J
A1P2-S1OF-01-07-RM	0.72 J	0.46 J	0.46 -	0.45 -	3.82 J	4.40 -	9.60 J
A1P2-S1OF-01-09-RM	0.67 J	0.45 J	0.45 -	0.44 -	3.29 J	5.10 -	9.90 J
A1P2-S1OF-01-10-RM	1.17 J	0.88 J	0.96 -	0.86 -	4.43 -	6.80 -	14.10 J
A1P2-S1OF-01-11-RM	0.85 J	0.71 J	0.74 -	0.70 -	4.18 -	6.80 -	16.30 J
A1P2-S1OF-01-13-RM	1.13 J	0.80 J	0.82 -	0.78 -	4.24 -	7.10 -	14.20 J
A1P2-S1OF-01-15-RM	1.00 J	0.79 J	0.83 -	0.78 -	4.86 -	7.10 -	16.60 J
A1P2-S1OF-01-16-RM	0.61 J	0.49 J	0.53 -	0.48 -	8.71 -	5.60 -	78.60 J
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.19 @	0.91 @	0.96 @	0.89 @	8.71 @	10.10 @	78.60 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S1SB-01

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S1SB-01-01-RM	1.28 J	1.12 J	1.14 -	1.10 -	7.72 -	8.40 -	16.70 -
A1P2-S1SB-01-03-RM	0.90 J	0.74 J	0.74 -	0.73 -	2.43 -	5.90 -	8.40 -
A1P2-S1SB-01-04-RM	1.12 J	0.90 J	0.92 -	0.89 -	3.94 -	6.60 -	11.40 -
A1P2-S1SB-01-06-RM	1.05 J	0.92 J	0.93 -	0.90 -	3.76 -	5.80 -	9.60 -
A1P2-S1SB-01-07-RM	1.33 J	1.12 J	1.16 -	1.11 -	13.55 -	10.20 -	38.10 -
A1P2-S1SB-01-08-RM	1.12 J	0.79 J	0.80 -	0.78 -	7.60 -	10.30 -	38.10 -
A1P2-S1SB-01-09-RM	1.24 J	0.93 J	0.95 -	0.92 -	10.28 -	5.90 -	18.10 -
A1P2-S1SB-01-10-RM	0.92 J	0.71 J	0.72 -	0.71 -	2.60 -	7.30 -	9.80 -
A1P2-S1SB-01-10-RM-D	0.93 J	0.64 J	0.65 -	0.64 -	3.36 -	6.30 -	8.80 -
A1P2-S1SB-01-12-RM	1.01 J	0.87 J	0.90 -	0.86 -	3.95 -	6.30 -	11.80 -
A1P2-S1SB-01-14-RM	1.49 J	1.32 J	1.36 -	1.30 -	4.57 -	9.20 -	12.60 -
A1P2-S1SB-01-15-RM	1.37 J	1.09 J	1.13 -	1.08 -	4.30 -	10.70 -	15.10 -
A1P2-S1SB-01-16-RM	1.35 J	1.02 J	1.06 -	1.00 -	5.26 -	8.60 -	14.40 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.49 @	1.32 @	1.36 @	1.30 @	13.55 @	10.70 @	38.10 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S1SB-02

Sample ID	PRIMARY COCs					SECONDARY COCs				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead
A1P2-S1SB-02-01-RM	0.84 -	0.69 -	0.67 -	0.69 -	3.42 -	1.16 U	2.13 J	4.70 J	0.09 -	10.60 -
A1P2-S1SB-02-01S-RM	0.98 -	0.69 -	0.70 -	0.69 -	2.82 U	1.30 U	3.05 J	3.35 UJ	0.18 -	11.30 -
A1P2-S1SB-02-03-RM	0.85 -	0.71 -	0.72 -	0.71 -	2.55 J	1.29 U	2.71 J	2.99 UJ	0.17 -	10.20 -
A1P2-S1SB-02-04-RM	0.85 -	0.72 -	0.72 -	0.72 -	2.02 J	1.17 U	2.72 J	3.45 UJ	0.16 -	10.90 -
A1P2-S1SB-02-04S-RM	1.25 -	1.04 -	1.02 -	1.04 -	5.63 -	1.34 U	1.80 J	6.51 J	0.17 -	14.80 -
A1P2-S1SB-02-06-RM	0.75 -	0.74 -	0.73 -	0.74 -	2.86 U	1.25 U	2.82 J	3.01 UJ	0.19 -	10.60 -
A1P2-S1SB-02-07-RM	0.80 -	0.65 -	0.63 -	0.65 -	2.45 U	1.24 U	3.34 J	3.05 UJ	0.19 -	11.00 -
A1P2-S1SB-02-08-RM	0.96 -	0.72 -	0.71 -	0.72 -	2.68 U	1.13 U	1.24 J	3.06 UJ	0.17 -	10.10 -
A1P2-S1SB-02-09-RM	0.80 -	0.64 -	0.63 -	0.64 -	2.49 J	1.05 U	1.46 J	3.00 UJ	0.12 -	9.89 -
A1P2-S1SB-02-10-RM	1.01 -	0.64 -	0.62 -	0.64 -	3.08 J	1.29 U	2.90 J	7.22 J	0.18 -	11.20 -
A1P2-S1SB-02-10S-RM	1.07 -	0.99 -	0.97 -	0.99 -	3.91 -	1.30 U	2.92 J	4.21 UJ	0.23 -	16.90 -
A1P2-S1SB-02-12-RM	0.83 -	0.67 -	0.66 -	0.67 -	2.90 U	1.27 U	2.14 J	2.96 UJ	0.10 -	12.00 -
A1P2-S1SB-02-12-RM-D	0.83 -	0.68 -	0.65 -	0.68 -	2.56 U	1.25 U	2.47 J	3.21 UJ	0.11 -	9.82 -
A1P2-S1SB-02-14-RM	0.87 -	0.63 -	0.63 -	0.63 -	2.64 U	1.24 U	3.07 J	3.05 J	0.20 -	11.20 -
A1P2-S1SB-02-15-RM	0.80 -	0.68 -	0.69 -	0.68 -	3.22 J	1.24 U	3.23 J	3.05 UJ	0.20 -	11.00 -
A1P2-S1SB-02-15S-RM	1.10 -	0.92 -	0.91 -	0.92 -	2.48 U	1.22 U	4.10 J	4.61 UJ	0.21 -	14.70 -
A1P2-S1SB-02-16-RM	0.83 -	0.71 -	0.71 -	0.71 -	2.88 J	1.21 U	2.95 J	4.80 J	0.03 U	9.84 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%
Max Result	1.25 @	1.04 @	1.02 @	1.04 @	5.63 @	1.34 U @	4.10 @	7.22 @	0.23 @	16.90 @
Standardized Skewness	--	--	--	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--
Sample Size	16	16	16	16	16	16	16	16	16	16
Estimated Mean	--	--	--	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

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Appendix A: Certification Statistics for A1P2-S1TR-01

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S1TR-01-01-RM	1.53 -	1.21 -	1.21 -	1.21 -	2.74 J	12.90 -	18.10 -
A1P2-S1TR-01-02-RM	1.38 -	1.14 -	1.12 -	1.14 -	6.84 -	13.20 -	29.10 -
A1P2-S1TR-01-03-RM	1.27 -	1.07 -	1.06 -	1.07 -	3.21 U	10.00 -	449.00 -
A1P2-S1TR-01-04-RM						7.39 -	36.70 -
A1P2-S1TR-01-05-RM	1.34 -	1.12 -	1.13 -	1.12 -	3.48 U	8.30 -	13.90 -
A1P2-S1TR-01-06-RM						12.00 -	92.10 -
A1P2-S1TR-01-07-RM	1.69 -	1.21 -	1.19 -	1.21 -	5.78 -	14.00 -	52.60 -
A1P2-S1TR-01-08-RM	1.37 -	1.19 -	1.16 -	1.19 -	4.66 J	14.40 -	138.00 -
A1P2-S1TR-01-09-RM						220.00 -	20000.00 -
A1P2-S1TR-01-10-RM	1.56 -	1.31 -	1.25 -	1.31 -	3.28 J	12.30 -	104.00 -
A1P2-S1TR-01-11-RM	1.39 -	1.15 -	1.15 -	1.15 -	5.20 -	10.10 -	19.80 -
A1P2-S1TR-01-12-RM	1.40 -	1.04 -	1.00 -	1.04 -	3.94 J	7.80 -	30.80 -
A1P2-S1TR-01-13-RM						13.40 -	498.00 -
A1P2-S1TR-01-14-RM	1.16 -	1.10 -	1.09 -	1.10 -	3.97 J	7.10 -	75.40 -
A1P2-S1TR-01-15-RM	1.27 -	1.02 -	1.01 -	1.02 -	5.15 -	5.10 -	29.30 -
A1P2-S1TR-01-15-RM-D	1.37 -	1.08 -	1.07 -	1.08 -	3.81 J	4.50 -	17.60 -
A1P2-S1TR-01-16-RM	1.25 -	1.10 -	1.10 -	1.10 -	4.23 J	5.20 -	83.90 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.69 @	1.31 @	1.25 @	1.31 @	6.84 @	220.00	20000.00
Standardized Skewness	--	--	--	--	--	4.870	4.892
W-Statistic Probability*	--	--	--	--	--	< 1% (LN)	< 1% (LN)
Test Procedure	--	--	--	--	--	Median	Median
Sample Size	12	12	12	12	12	16	16
Estimated Mean	--	--	--	--	--	11.05	64.00
UCL on the Mean**	--	--	--	--	--	13.20	104.00
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	FAIL	Pass
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	FAIL	FAIL
a posteriori Sample	--	--	--	--	--	Infinite	10
Size calculation	--	--	--	--	--	FAIL	Pass

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S1TR-01 (Location 09 replaced by 6"-12" sample result)

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S1TR-01-01-RM	1.53 -	1.21 -	1.21 -	1.21 -	2.74 J	12.90 -	18.10 -
A1P2-S1TR-01-02-RM	1.38 -	1.14 -	1.12 -	1.14 -	6.84 -	13.20 -	29.10 -
A1P2-S1TR-01-03-RM	1.27 -	1.07 -	1.06 -	1.07 -	3.21 U	10.00 -	449.00 -
A1P2-S1TR-01-04-RM						7.39 -	36.70 -
A1P2-S1TR-01-05-RM	1.34 -	1.12 -	1.13 -	1.12 -	3.48 U	8.30 -	13.90 -
A1P2-S1TR-01-06-RM						12.00 -	92.10 -
A1P2-S1TR-01-07-RM	1.69 -	1.21 -	1.19 -	1.21 -	5.78 -	14.00 -	52.60 -
A1P2-S1TR-01-08-RM	1.37 -	1.19 -	1.16 -	1.19 -	4.66 J	14.40 -	138.00 -
A1P2-S1TR-01-09-RM (6"-12")						10.90 -	28.80 -
A1P2-S1TR-01-10-RM	1.56 -	1.31 -	1.25 -	1.31 -	3.28 J	12.30 -	104.00 -
A1P2-S1TR-01-11-RM	1.39 -	1.15 -	1.15 -	1.15 -	5.20 -	10.10 -	19.80 -
A1P2-S1TR-01-12-RM	1.40 -	1.04 -	1.00 -	1.04 -	3.94 J	7.80 -	30.80 -
A1P2-S1TR-01-13-RM						13.40 -	498.00 -
A1P2-S1TR-01-14-RM	1.16 -	1.10 -	1.09 -	1.10 -	3.97 J	7.10 -	75.40 -
A1P2-S1TR-01-15-RM	1.27 -	1.02 -	1.01 -	1.02 -	5.15 -	5.10 -	29.30 -
A1P2-S1TR-01-15-RM-D	1.37 -	1.08 -	1.07 -	1.08 -	3.81 J	4.50 -	17.60 -
A1P2-S1TR-01-16-RM	1.25 -	1.10 -	1.10 -	1.10 -	4.23 J	5.20 -	83.90 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.69 @	1.31 @	1.25 @	1.31 @	6.84 @	14.40	498.00
Standardized Skewness	--	--	--	--	--	-0.407	2.762
W-Statistic Probability*	--	--	--	--	--	11.4% (N)	8.0% (LN)
Test Procedure	--	--	--	--	--	t-Test (N)	t-Test (LN)
Sample Size	12	12	12	12	12	16	16
Estimated Mean	--	--	--	--	--	10.26	100.77
UCL on the Mean**	--	--	--	--	--	11.30	176.01
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	Pass	Pass
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	16	3
Size calculation	--	--	--	--	--	Pass	Pass

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S1TR-02

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S1TR-02-01-RM	1.14 -	0.89 -	0.89 -	0.89 -	5.94 -	6.60 J	115.00 -
A1P2-S1TR-02-02-RM	0.99 -	0.82 -	0.81 -	0.82 -	2.33 U	8.50 J	16.70 -
A1P2-S1TR-02-03-RM	1.27 -	1.08 -	1.06 -	1.08 -	3.24 U	8.10 J	11.90 -
A1P2-S1TR-02-05-RM	1.47 -	1.13 -	1.10 -	1.13 -	6.63 -	10.50 J	195.00 -
A1P2-S1TR-02-06-RM	1.34 -	1.10 -	1.10 -	1.10 -	4.22 J	14.20 J	37.70 -
A1P2-S1TR-02-08-RM	1.22 -	1.00 -	0.98 -	1.00 -	6.98 -	11.40 J	461.00 -
A1P2-S1TR-02-09-RM	1.20 -	0.96 -	0.95 -	0.96 -	8.58 -	8.50 J	48.30 -
A1P2-S1TR-02-11-RM	0.84 J	0.69 J	0.67 J	0.69 J	4.62 -	5.30 J	15.70 -
A1P2-S1TR-02-11-RM-D	1.07 -	0.86 -	0.85 -	0.86 -	5.99 -	7.00 J	65.60 -
A1P2-S1TR-02-12-RM	1.24 -	1.07 -	1.09 -	1.07 -	6.04 -	5.90 J	22.10 -
A1P2-S1TR-02-14-RM	1.28 -	1.07 -	1.04 -	1.07 -	4.05 J	5.40 J	18.40 -
A1P2-S1TR-02-15-RM	1.31 -	1.03 -	1.00 -	1.03 -	6.15 -	6.40 J	15.00 -
A1P2-S1TR-02-16-RM	1.13 -	0.97 -	0.92 -	0.97 -	9.32 -	7.40 J	19.20 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.47 @	1.13 @	1.10 @	1.13 @	9.32 @	14.20	461.00
Standardized Skewness	--	--	--	--	--	1.708	3.664
W-Statistic Probability*	--	--	--	--	--	70.8% (LN)	14.4% (LN)
Test Procedure	--	--	--	--	--	t-Test (LN)	t-Test (LN)
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	8.34	81.05
UCL on the Mean**	--	--	--	--	--	9.42	177.69
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	Pass	Pass
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	4	2
Size calculation	--	--	--	--	--	Pass	Pass

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

100099

Appendix A: Certification Statistics for A1P2-S1TR-03

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S1TR-03-01-RM	1.37 -	1.07 -	1.05 -	1.07 -	3.56 J	6.60 -	46.00 -
A1P2-S1TR-03-02-RM	1.29 J	1.08 -	1.08 -	1.08 -	9.87 -	8.20 -	219.00 J
A1P2-S1TR-03-02-RM-D	1.15 -	0.99 -	0.96 -	0.99 -	10.44 -	9.40 -	776.00 J
A1P2-S1TR-03-04-RM	1.37 -	1.10 -	1.09 -	1.10 -	5.50 -	7.60 -	120.00 -
A1P2-S1TR-03-05-RM	1.15 -	0.99 -	0.97 -	0.99 -	3.92 J	5.90 -	46.70 -
A1P2-S1TR-03-06-RM	1.52 -	1.16 -	1.12 -	1.16 -	2.73 U	13.50 -	21.80 -
A1P2-S1TR-03-08-RM	1.77 -	1.30 -	1.29 -	1.30 -	4.68 J	18.40 -	25.40 -
A1P2-S1TR-03-09-RM	1.45 -	1.15 -	1.14 -	1.15 -	3.48 J	13.50 -	23.70 -
A1P2-S1TR-03-11-RM	1.27 -	1.15 -	1.14 -	1.15 -	3.69 -	10.60 -	16.80 -
A1P2-S1TR-03-12-RM	1.26 -	1.12 -	1.09 -	1.12 -	4.92 J	10.60 -	24.80 -
A1P2-S1TR-03-13-RM	1.31 -	1.17 -	1.15 -	1.17 -	4.77 J	11.20 -	80.80 -
A1P2-S1TR-03-14-RM	1.57 -	1.20 -	1.19 -	1.20 -	5.04 -	14.70 -	19.00 -
A1P2-S1TR-03-16-RM	1.46 -	1.28 -	1.27 -	1.28 -	6.10 -	8.50 -	33.50 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.77	1.30 @	1.29 @	1.30 @	10.44 @	18.40	776.00
Standardized Skewness	1.201	--	--	--	--	0.839	4.730
W-Statistic Probability*	91.7% (LN)	--	--	--	--	95.9% (LN)	< 1% (LN)
Test Procedure	t-Test (LN)	--	--	--	--	t-Test (LN)	Median
Sample Size	12	12	12	12	12	12	12
Estimated Mean	1.40	--	--	--	--	10.94	29.45
UCL on the Mean**	1.49	--	--	--	--	12.69	46.70
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	Pass	--	--	--	--	FAIL	Pass
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	4 Pass	--	--	--	--	24 Fail	5 Pass

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S1TR-03 - Subset

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S1TR-03-01-RM	1.37 -	1.07 -	1.05 -	1.07 -	3.56 J	6.60 -	46.00 -
A1P2-S1TR-03-02-RM	1.29 J	1.08 -	1.08 -	1.08 -	9.87 -	8.20 -	219.00 J
A1P2-S1TR-03-02-RM-D	1.15 -	0.99 -	0.96 -	0.99 -	10.44 -	9.40 -	776.00 J
A1P2-S1TR-03-04-RM	1.37 -	1.10 -	1.09 -	1.10 -	5.50 -	7.60 -	120.00 -
A1P2-S1TR-03-05-RM	1.15 -	0.99 -	0.97 -	0.99 -	3.92 J	5.90 -	46.70 -
A1P2-S1TR-03-11-RM	1.27 -	1.15 -	1.14 -	1.15 -	3.69 -	10.60 -	16.80 -
A1P2-S1TR-03-12-RM	1.26 -	1.12 -	1.09 -	1.12 -	4.92 J	10.60 -	24.80 -
A1P2-S1TR-03-13-RM	1.31 -	1.17 -	1.15 -	1.17 -	4.77 J	11.20 -	80.80 -
A1P2-S1TR-03-14-RM	1.57 -	1.20 -	1.19 -	1.20 -	5.04 -	14.70 -	19.00 -
A1P2-S1TR-03-16-RM	1.46 -	1.28 -	1.27 -	1.28 -	6.10 -	8.50 -	33.50 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.57 @	1.28 @	1.27 @	1.28 @	10.44 @	14.70	776.00
Standardized Skewness	--	--	--	--	--	1.027	4.732
W-Statistic Probability*	--	--	--	--	--	93.7% (LN)	23.9% (LN)
Test Procedure	--	--	--	--	--	t-Test (LN)	t-Test (LN)
Sample Size	9	9	9	9	9	9	9
Estimated Mean	--	--	--	--	--	9.50	110.13
UCL on the Mean**	--	--	--	--	--	11.00	316.60
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	Pass	Pass
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	6	3
Size calculation	--	--	--	--	--	Pass	Pass

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

NOTES:

(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

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

(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.

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

Appendix A: Certification Statistics for A1P2-S1TR-04

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S1TR-04-02-RM	1.39 -	1.14 -	1.12 -	1.14 -	3.16 U	9.10 -	24.10 -
A1P2-S1TR-04-03-RM	1.24 -	1.04 -	1.02 -	1.04 -	7.98 -	6.70 -	177.00 -
A1P2-S1TR-04-04-RM	1.36 -	1.09 -	1.06 -	1.09 -	9.36 -	8.00 -	46.90 -
A1P2-S1TR-04-05-RM	1.27 -	1.04 -	1.01 -	1.04 -	8.66 -	7.90 -	222.00 -
A1P2-S1TR-04-07-RM	1.23 -	0.98 -	0.95 -	0.98 -	6.94 -	6.70 -	28.90 -
A1P2-S1TR-04-08-RM	1.44 -	1.14 -	1.12 -	1.14 -	6.82 -	8.40 -	22.40 -
A1P2-S1TR-04-09-RM	1.31 -	1.15 -	1.14 -	1.15 -	4.68 J	6.90 -	20.80 -
A1P2-S1TR-04-10-RM	0.94 -	0.91 -	0.92 -	0.91 -	15.85 -	5.80 -	50.10 -
A1P2-S1TR-04-10-RM-D	1.04 -	0.89 -	0.87 -	0.89 -	13.71 -	4.60 -	45.30 -
A1P2-S1TR-04-12-RM	1.15 -	0.88 -	0.82 -	0.88 -	3.33 U	6.40 -	21.50 -
A1P2-S1TR-04-13-RM	1.42 -	1.04 -	1.05 -	1.04 -	5.01 J	6.30 -	14.10 -
A1P2-S1TR-04-14-RM	1.27 -	1.14 -	1.14 -	1.14 -	3.51 U	8.30 -	25.40 -
A1P2-S1TR-04-15-RM	1.14 -	1.08 -	1.05 -	1.08 -	3.33 U	6.60 -	17.10 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.44 @	1.15 @	1.14 @	1.15 @	15.85 @	9.10 @	222.00 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S1TR-05

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S1TR-05-01-RM	1.46 J	1.31 J	1.37 -	1.29 -	10.86 -	10.90 -	28.40 -
A1P2-S1TR-05-02-RM	1.33 J	1.06 J	1.11 -	1.05 -	7.14 -	9.30 -	16.90 -
A1P2-S1TR-05-04-RM	1.00 J	0.83 J	0.86 -	0.81 -	12.44 -	9.90 -	94.20 -
A1P2-S1TR-05-05-RM	1.16 J	1.03 J	1.07 -	1.01 -	14.18 -	9.40 -	27.00 -
A1P2-S1TR-05-07-RM	1.01 J	0.77 J	0.82 -	0.75 -	12.94 -	6.70 -	54.50 -
A1P2-S1TR-05-08-RM	0.96 J	0.82 J	0.86 -	0.81 -	13.44 -	8.50 -	28.10 -
A1P2-S1TR-05-09-RM	1.05 J	0.89 J	0.94 -	0.88 -	16.69 -	7.60 -	139.00 -
A1P2-S1TR-05-11-RM	1.23 J	1.02 J	1.06 -	1.00 -	17.91 -	6.60 -	140.00 -
A1P2-S1TR-05-12-RM	0.92 J	0.79 J	0.84 -	0.78 -	12.01 -	6.20 -	24.00 -
A1P2-S1TR-05-13-RM	1.26 J	1.08 J	1.14 -	1.06 -	14.97 -	6.60 -	31.50 -
A1P2-S1TR-05-14-RM	1.26 J	1.07 J	1.13 -	1.05 -	11.77 -	7.30 -	37.40 -
A1P2-S1TR-05-14-RM-D	1.04 J	1.11 J	1.16 -	1.09 -	12.85 -	6.90 -	62.00 -
A1P2-S1TR-05-15-RM	0.98 J	0.92 J	0.97 -	0.91 -	9.09 -	6.60 -	25.70 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.46 @	1.31 @	1.37 @	1.29 @	17.91 @	10.90 @	140.00 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S1TR-07

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S1TR-07-01-RM	1.02 J	0.98 J	1.04 J	0.98 J	12.20 J	9.90 -	18.60 -
A1P2-S1TR-07-02-RM	1.06 J	1.11 J	1.20 J	1.11 J	10.40 J	10.60 -	12.70 -
A1P2-S1TR-07-04-RM	1.09 J	1.02 J	1.12 J	1.02 J	6.22 J	10.00 -	13.10 -
A1P2-S1TR-07-05-RM	0.94 J	0.94 J	1.01 J	0.94 J	8.53 J	7.30 -	13.60 -
A1P2-S1TR-07-06-RM	1.07 J	1.06 J	1.14 J	1.06 J	11.60 J	10.20 -	16.70 -
A1P2-S1TR-07-06-RM-D	1.16 J	1.02 J	1.04 J	1.02 J	7.37 J	8.70 -	14.10 -
A1P2-S1TR-07-08-RM	1.23 J	0.99 J	1.09 J	0.99 J	8.64 UJ	9.00 -	15.30 -
A1P2-S1TR-07-09-RM	1.19 J	1.07 J	1.23 J	1.07 J	8.39 J	4.80 -	8.30 -
A1P2-S1TR-07-10-RM	1.14 J	1.06 J	1.18 J	1.06 J	11.00 J	7.50 -	14.90 -
A1P2-S1TR-07-12-RM	1.03 J	1.08 J	1.08 J	1.08 J	13.70 J	11.60 -	16.40 -
A1P2-S1TR-07-13-RM	1.17 J	1.15 J	1.20 J	1.15 J	10.60 J	8.40 -	13.80 -
A1P2-S1TR-07-14-RM	1.05 J	0.82 J	0.81 J	0.82 J	9.29 J	7.20 -	13.00 -
A1P2-S1TR-07-15-RM	0.95 J	0.86 J	0.84 J	0.86 J	10.10 J	8.40 -	12.40 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.23 @	1.15 @	1.23 @	1.15 @	13.70 @	11.60 @	18.60 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S1TR-08

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S1TR-08-01-RM	1.24 J	1.23 J	1.26 J	1.22 J	5.23 J	11.80 -	21.70 -
A1P2-S1TR-08-02-RM	1.23 J	0.98 -	1.00 -	0.97 -	6.67 J	5.90 -	13.90 -
A1P2-S1TR-08-04-RM	1.11 J	0.93 -	0.92 -	0.92 -	21.09 -	10.00 -	29.10 -
A1P2-S1TR-08-06-RM	0.94 J	0.87 -	0.89 -	0.86 -	5.33 -	6.90 -	14.00 -
A1P2-S1TR-08-07-RM	1.07 J	0.94 J	0.95 J	0.93 J	6.11 J	7.80 -	16.20 -
A1P2-S1TR-08-07-RM-D	0.98 J	0.79 J	0.81 J	0.78 J	12.17 J	8.40 -	17.70 -
A1P2-S1TR-08-08-RM	1.54 J	1.26 -	1.29 -	1.25 -	4.83 -	11.90 -	16.60 -
A1P2-S1TR-08-10-RM	1.13 J	0.89 -	0.91 -	0.88 -	7.35 -	6.60 -	27.10 -
A1P2-S1TR-08-11-RM	0.93 J	0.75 -	0.78 -	0.75 -	4.85 -	6.10 -	15.20 -
A1P2-S1TR-08-12-RM	0.87 J	0.79 -	0.79 -	0.78 -	3.15 -	8.20 -	24.50 -
A1P2-S1TR-08-13-RM	0.78 J	0.68 -	0.71 -	0.68 -	44.49 UJ	4.70 -	24.80 -
A1P2-S1TR-08-14-RM	1.72 J	1.31 J	1.42 J	1.30 J	5.42 J	8.20 -	15.30 -
A1P2-S1TR-08-15-RM	0.74 J	0.71 -	0.73 -	0.70 -	2.50 -	6.20 -	9.50 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.72	1.31 @	1.42 @	1.30 @	21.09 @	11.90 @	29.10 @
Standardized Skewness	1.250	--	--	--	--	--	--
W-Statistic Probability*	83.4% (LN)	--	--	--	--	--	--
Test Procedure	t-Test (LN)	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	1.11	--	--	--	--	--	--
UCL on the Mean**	1.28	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	Pass	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	4	--	--	--	--	--	--
	Pass	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S1TR-09

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S1TR-09-02-RM	1.05 J	0.78 J	0.79 -	0.77 -	16.64 -	5.80 -	25.60 -
A1P2-S1TR-09-03-RM	0.99 J	0.90 J	0.91 -	0.89 -	15.32 -	5.10 -	26.50 -
A1P2-S1TR-09-04-RM	1.31 J	1.03 J	1.03 -	1.01 -	1.38 UJ	7.30 -	12.60 -
A1P2-S1TR-09-06-RM	1.14 J	1.08 J	1.12 J	1.07 J	16.72 J	5.90 -	23.20 -
A1P2-S1TR-09-06-RM-D	0.87 J	0.82 J	0.84 J	0.82 J	11.75 J	6.60 -	24.70 -
A1P2-S1TR-09-07-RM	0.89 J	1.01 J	1.06 -	1.00 -	18.22 -	6.10 -	31.00 -
A1P2-S1TR-09-08-RM	1.19 J	1.02 J	1.03 -	1.01 -	5.89 -	7.20 -	17.00 -
A1P2-S1TR-09-09-RM	0.98 J	1.03 J	1.05 -	1.02 -	8.70 -	5.50 -	19.40 -
A1P2-S1TR-09-10-RM	1.16 J	0.97 J	0.99 -	0.97 -	13.00 -	5.60 -	24.90 -
A1P2-S1TR-09-12-RM	1.05 J	1.00 J	1.01 J	0.99 J	12.06 J	6.20 -	28.90 -
A1P2-S1TR-09-13-RM	0.95 J	0.85 J	0.87 -	0.84 -	3.57 -	7.40 -	13.20 -
A1P2-S1TR-09-14-RM	0.97 J	0.97 J	0.99 -	0.96 -	14.60 -	6.90 -	34.30 -
A1P2-S1TR-09-16-RM	1.18 J	0.97 J	0.98 -	0.96 -	10.09 -	6.80 -	26.00 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.31 @	1.08 @	1.12 @	1.07 @	18.22 @	7.40 @	34.30 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S1TR-11

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S1TR-11-02-RM	1.15 J	0.92 J	0.94 -	0.91 -	11.22 -	16.70 -	24.60 -
A1P2-S1TR-11-03-RM	1.21 J	0.95 J	0.98 -	0.94 -	8.43 -	12.70 -	30.10 -
A1P2-S1TR-11-04-RM	1.16 J	0.82 J	1.00 -	0.81 -	13.26 -	7.30 -	91.10 -
A1P2-S1TR-11-05-RM	1.02 J	1.00 J	1.03 -	0.99 -	9.61 -	9.70 -	22.90 -
A1P2-S1TR-11-07-RM	1.07 J	0.87 J	0.90 -	0.86 -	7.54 -	6.80 -	27.10 -
A1P2-S1TR-11-08-RM	1.01 J	1.00 J	1.03 -	0.99 -	5.65 -	7.60 -	34.90 -
A1P2-S1TR-11-10-RM	0.93 J	0.73 J	0.75 -	0.72 -	11.98 -	9.10 -	91.40 -
A1P2-S1TR-11-11-RM	1.02 J	0.73 J	0.72 -	0.73 -	6.88 -	9.60 -	13.60 -
A1P2-S1TR-11-12-RM	0.80 J	0.61 J	0.63 -	0.60 -	5.78 -	6.20 -	26.50 -
A1P2-S1TR-11-14-RM	1.15 J	1.02 J	1.04 -	1.01 -	5.97 -	5.30 -	28.30 -
A1P2-S1TR-11-15-RM	1.03 J	0.82 J	0.85 J	0.81 J	5.16 -	7.10 -	37.50 -
A1P2-S1TR-11-15-RM-D	1.14 J	1.05 J	1.09 J	1.04 J	5.55 -	7.10 -	47.40 -
A1P2-S1TR-11-16-RM	1.21 J	0.92 J	0.90 -	0.91 -	8.81 -	5.60 -	27.10 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.21 @	1.05 @	1.09 @	1.04 @	13.26 @	16.70	91.40 @
Standardized Skewness	--	--	--	--	--	2.171	--
W-Statistic Probability*	--	--	--	--	--	47.0% (LN)	--
Test Procedure	--	--	--	--	--	t-Test (LN)	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	8.65	--
UCL on the Mean**	--	--	--	--	--	10.03	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	Pass	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	5	--
Size calculation	--	--	--	--	--	Pass	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S1TR-12

Sample ID	Secondary COCs	
	ARSENIC	LEAD
A1P2-S1TR-12-01-M	7.11 -	28.60 -
A1P2-S1TR-12-02-M-D	17.40 J	29.00 -
A1P2-S1TR-12-03-M	11.00 -	25.80 -
A1P2-S1TR-12-04-M	13.80 -	33.30 -
A1P2-S1TR-12-05-M	16.90 -	35.70 -
A1P2-S1TR-12-06-M	14.90 -	24.70 -
A1P2-S1TR-12-07-M	5.71 -	90.70 -
A1P2-S1TR-12-08-M	9.14 -	26.60 -
A1P2-S1TR-12-09-M	5.83 -	18.70 -
A1P2-S1TR-12-10-M	13.50 -	32.70 -
A1P2-S1TR-12-11-M	11.60 -	32.30 -
A1P2-S1TR-12-12-M	7.50 -	27.50 -
A1P2-S1TR-12-13-M	6.14 -	23.30 -
A1P2-S1TR-12-14-M	13.30 -	33.60 -
A1P2-S1TR-12-15-M	10.20 -	28.00 -
A1P2-S1TR-12-16-M	12.10 -	32.10 -
FRL	12.00	400.00
Units	mg/kg	mg/kg
Confidence Level	90%	90%
Max. Result	17.4	90.7 @
Standardized Skewness	0.138	- -
W-statistic Prob.*	43.1% (N)	- -
Test Procedure	t-Test (N)	- -
Sample Size	16	16
Estimated Mean	11.01	- -
UCL on the Mean**	12.30	- -
Non-Parametric Prob.	- -	- -
Est. Mean - Pass / Fail	FAIL	- -
2x Rule Pass / Fail	Pass	- -

a posteriori Sample	69	- -
Size calculation	Fail	- -

NOTES:

(1) @ Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

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

(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.

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

Appendix A: Certification Statistics for A1P2-S1TR-13

Sample ID	Secondary COCs ARSENIC
A1P2-S1TR-13-01-M	15.100 -
A1P2-S1TR-13-02-M	10.700 -
A1P2-S1TR-13-04-M	14.400 -
A1P2-S1TR-13-05-M	7.520 -
A1P2-S1TR-13-06-M	7.920 -
A1P2-S1TR-13-08-M	9.950 -
A1P2-S1TR-13-09-M-D	9.670 -
A1P2-S1TR-13-10-M	10.700 -
A1P2-S1TR-13-12-M	6.650 -
A1P2-S1TR-13-14-M	3.770 -
A1P2-S1TR-13-15-M	6.160 -
A1P2-S1TR-13-16-M	7.610 -
FRL	12
Units	mg/kg
Confidence Level	0.9
Max. Result	15.1
Standardized Skewness	0.63
W-statistic Prob.*	66.6% (LN)
Test Procedure	t-Test (LN)
Sample Size	12
Estimated Mean	9.27
UCL on the Mean**	11.00
Non-Parametric Prob.	- -
Est. Mean - Pass / Fail	Pass
2x Rule Pass / Fail	Pass

a posteriori Sample	7
Size calculation	Pass

NOTES:

(1) @ Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

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

(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.

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

Appendix A: Certification Statistics for A1P2-S2HR-01

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2HR-01-01B-RM	1.29 -	1.08 -	1.06 -	1.08 -	4.02 J	4.11 -	23.90 -
A1P2-S2HR-01-02B-RM	1.24 -	1.10 -	1.12 -	1.10 -	11.07 -	10.50 -	24.20 -
A1P2-S2HR-01-03B-RM	1.26 -	1.09 -	1.09 -	1.09 -	37.33 -	14.90 -	38.90 -
A1P2-S2HR-01-05B-RM	1.35 -	1.25 -	1.22 -	1.25 -	39.86 -	7.26 -	25.30 -
A1P2-S2HR-01-05B-RM-D	1.29 -	1.20 -	1.20 -	1.20 -	45.59 -	6.93 -	29.10 -
A1P2-S2HR-01-06B-RM	1.11 -	1.14 -	1.13 -	1.14 -	29.09 -	6.74 -	23.10 -
A1P2-S2HR-01-08B-RM	1.25 -	1.16 -	1.13 -	1.16 -	40.97 -	3.15 -	24.80 -
A1P2-S2HR-01-09B-RM	1.21 -	1.16 -	1.14 -	1.16 -	29.05 -	5.64 -	25.00 -
A1P2-S2HR-01-10B-RM	1.15 -	1.28 -	1.25 -	1.28 -	40.32 -	3.49 -	30.00 -
A1P2-S2HR-01-12B-RM	1.28 -	1.22 -	1.22 -	1.22 -	42.98 -	5.78 -	27.50 -
A1P2-S2HR-01-13B-RM	1.20 -	0.98 -	0.96 -	0.98 -	9.49 -	12.30 -	27.00 -
A1P2-S2HR-01-14B-RM	1.23 -	1.23 -	1.20 -	1.23 -	16.98 -	6.31 -	25.50 -
A1P2-S2HR-01-15B-RM	1.24 -	1.18 -	1.16 -	1.18 -	23.63 -	5.11 -	27.00 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.35 @	1.28 @	1.25 @	1.28 @	45.59 @	14.90	38.90 @
Standardized Skewness	--	--	--	--	--	1.608	--
W-Statistic Probability*	--	--	--	--	--	75.1% (LN)	--
Test Procedure	--	--	--	--	--	t-Test (LN)	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	7.15	--
UCL on the Mean**	--	--	--	--	--	8.96	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	Pass	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	4	--
Size calculation	--	--	--	--	--	Pass	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S2NI-03

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2NI-03-02-RM	1.34 -	1.01 -	1.00 -	1.01 -	8.76 -	2.94 U	23.50 -
A1P2-S2NI-03-03-RM	1.19 -	0.99 -	0.98 -	0.99 -	2.89 U	7.56 U	16.90 -
A1P2-S2NI-03-04-RM	1.19 -	1.03 -	1.02 -	1.03 -	14.54 -	5.74 U	19.00 -
A1P2-S2NI-03-05-RM	1.15 -	1.00 -	1.02 -	1.00 -	11.64 -	5.57 U	17.90 -
A1P2-S2NI-03-06-RM	1.23 -	1.10 -	1.09 -	1.10 -	31.01 -	4.84 U	20.70 -
A1P2-S2NI-03-08-RM	1.10 -	1.13 -	1.13 -	1.13 -	33.10 -	6.98 U	23.40 -
A1P2-S2NI-03-09-RM	1.30 -	1.13 -	1.11 -	1.13 -	12.59 -	4.87 U	23.00 -
A1P2-S2NI-03-09-RM-D	1.27 -	1.00 -	0.98 -	1.00 -	12.93 -	6.26 U	25.10 -
A1P2-S2NI-03-11-RM	1.14 -	0.93 -	0.91 -	0.93 -	9.83 -	4.60 U	23.80 -
A1P2-S2NI-03-12-RM	1.11 -	1.02 -	1.02 -	1.02 -	37.19 -	8.02 U	28.10 -
A1P2-S2NI-03-14-RM	1.42 -	1.06 -	1.05 -	1.06 -	5.83 -	6.62 U	20.30 -
A1P2-S2NI-03-15-RM	1.19 -	1.23 -	1.21 -	1.23 -	37.09 -	6.81 U	28.90 -
A1P2-S2NI-03-16-RM	1.19 -	1.38 -	1.39 -	1.38 -	54.96 -	6.98 U	19.40 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.42 @	1.38 @	1.39 @	1.38 @	54.96 @	8.02 U @	28.90 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S2NI-04

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2NI-04-01-RM	1.09 J	1.29 J	1.34 J	1.29 J	33.20 J	7.40 -	29.40 -
A1P2-S2NI-04-03-RM	1.04 J	1.05 J	1.05 J	1.05 J	21.10 J	8.00 -	17.90 -
A1P2-S2NI-04-04-RM	1.14 J	1.20 J	1.26 J	1.20 J	28.10 J	10.80 -	24.70 -
A1P2-S2NI-04-05-RM	1.05 J	1.25 J	1.38 J	1.25 J	59.60 J	12.40 -	30.60 -
A1P2-S2NI-04-06-RM	1.07 J	1.33 J	1.02 J	1.33 J	71.80 J	6.70 -	19.60 -
A1P2-S2NI-04-06-RM-D	1.06 J	1.29 J	1.40 J	1.29 J	47.50 J	6.20 -	24.40 -
A1P2-S2NI-04-08-RM	1.13 J	1.08 J	1.22 J	1.08 J	28.90 J	7.90 -	20.50 -
A1P2-S2NI-04-10-RM	1.16 J	1.32 J	1.01 J	1.32 J	44.10 J	7.10 -	15.90 -
A1P2-S2NI-04-11-RM	1.03 J	1.37 J	1.48 J	1.37 J	59.10 J	7.20 -	22.30 -
A1P2-S2NI-04-12-RM	1.18 J	1.16 J	1.30 J	1.16 J	33.70 J	8.40 -	18.90 -
A1P2-S2NI-04-13-RM	1.23 J	1.26 J	1.29 J	1.26 J	34.30 J	7.40 -	18.00 -
A1P2-S2NI-04-15-RM	1.06 J	1.19 J	1.24 J	1.19 J	26.40 J	9.40 -	26.60 -
A1P2-S2NI-04-16-RM	1.27 J	1.42 J	1.12 J	1.42 J	37.80 J	9.00 -	26.50 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.27 @	1.42 @	1.48 @	1.42 @	71.80 @	12.40	30.60 @
Standardized Skewness	--	--	--	--	--	1.941	--
W-Statistic Probability*	--	--	--	--	--	19.8% (LN)	--
Test Procedure	--	--	--	--	--	t-Test (LN)	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	8.48	--
UCL on the Mean**	--	--	--	--	--	9.15	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	Pass	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	2	--
Size calculation	--	--	--	--	--	Pass	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S2NI-05

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2NI-05-01-RM	1.44 J	1.21 J	0.94 J	1.21 J	5.50 J	8.40 -	18.20 J
A1P2-S2NI-05-02-RM	1.23 J	1.26 J	0.98 J	1.26 J	17.70 J	6.70 -	16.00 J
A1P2-S2NI-05-03-RM	1.05 J	1.05 J	1.12 J	1.05 J	23.00 J	7.40 -	22.30 J
A1P2-S2NI-05-04-RM	1.41 -	1.22 -	1.25 -	1.22 -	13.42 -		
A1P2-S2NI-05-05-RM	1.14 J	1.02 J	1.09 J	1.02 J	9.66 J	7.70 -	20.30 J
A1P2-S2NI-05-06-RM	1.17 J	1.21 J	0.95 J	1.21 J	8.85 J	8.60 -	17.20 J
A1P2-S2NI-05-07-RM	1.31 -	1.31 -	1.30 -	1.31 -	45.20 -		
A1P2-S2NI-05-08-RM	1.20 J	1.31 J	1.44 J	1.31 J	52.20 J	10.20 -	32.60 J
A1P2-S2NI-05-08-RM-D	1.53 J	1.39 J	1.42 J	1.39 J	39.60 J	7.90 -	26.10 J
A1P2-S2NI-05-09-RM	1.27 -	1.18 -	1.17 -	1.18 -	36.93 -		
A1P2-S2NI-05-10-RM	1.31 J	2.53 J	0.95 J	1.31 J	12.80 J	11.70 -	22.30 J
A1P2-S2NI-05-11-RM	1.26 J	1.32 J	1.55 J	1.32 J	64.90 J	6.20 -	22.60 J
A1P2-S2NI-05-12-RM	1.26 J	1.35 J	1.33 J	1.35 J	55.00 J	6.50 -	22.20 J
A1P2-S2NI-05-13-RM	1.45 J	1.49 J	1.67 J	1.49 J	54.70 J	9.00 -	26.70 J
A1P2-S2NI-05-14-RM	1.28 -	1.18 -	1.18 -	1.18 -	39.70 -		
A1P2-S2NI-05-15-RM	1.23 J	1.51 J	1.38 J	1.51 J	62.60 J	6.60 -	22.30 J
A1P2-S2NI-05-16-RM	1.17 J	1.47 J	1.21 J	1.47 J	63.10 J	7.20 -	23.70 J
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.53 @	2.53	1.67 @	1.51	64.90 @	11.70 @	32.60 @
Standardized Skewness	--	--	--	-0.084	--	--	--
W-Statistic Probability*	--	--	--	63.0% (N)	--	--	--
Test Procedure	--	--	--	t-Test (N)	--	--	--
Sample Size	16	16	16	16	16	12	12
Estimated Mean	--	--	--	1.28	--	--	--
UCL on the Mean**	--	--	--	1.34	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	Pass	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	4	--	--	--
Size calculation	--	--	--	Pass	--	--	--

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

NOTES:

(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

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

(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.

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

000113

Appendix A: Certification Statistics for A1P2-S2NI-06

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2NI-06-01-RM	0.93 J	0.91 J	0.95 J	0.91 J	7.74 J	5.90 -	22.90 -
A1P2-S2NI-06-03-RM	1.15 J	1.13 J	1.18 J	1.34 J	16.10 J	5.40 -	17.60 -
A1P2-S2NI-06-04-RM	1.12 J	1.06 J	1.15 J	1.06 J	11.00 J	6.70 -	10.40 -
A1P2-S2NI-06-05-RM	0.89 J	0.99 J	1.01 J	0.99 J	32.50 J	7.60 -	21.70 -
A1P2-S2NI-06-06-RM	0.79 J	0.75 J	0.81 J	0.75 J	6.25 J	5.10 -	15.10 -
A1P2-S2NI-06-08-RM	0.79 J	0.69 J	0.75 J	0.69 J	4.93 J	5.40 -	13.20 -
A1P2-S2NI-06-09-RM	0.85 J	0.68 J	0.78 J	0.68 J	3.64 U	8.30 -	39.90 -
A1P2-S2NI-06-11-RM	1.15 J	0.98 J	1.09 J	0.98 J	22.60 J	5.60 -	12.50 -
A1P2-S2NI-06-11-RM-D	1.19 J	1.02 J	1.11 J	1.02 J	33.80 J	5.40 -	21.80 -
A1P2-S2NI-06-12-RM	1.18 J	1.09 J	1.13 J	1.09 J	9.95 J	3.90 -	22.20 -
A1P2-S2NI-06-13-RM	1.11 J	1.05 J	1.13 J	1.05 J	9.33 J	5.70 -	27.20 -
A1P2-S2NI-06-15-RM	1.16 J	1.06 J	1.14 J	1.06 J	39.60 J	6.40 -	20.60 -
A1P2-S2NI-06-16-RM	0.99 J	0.89 J	0.93 J	0.89 J	22.80 J	4.50 -	19.50 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.19 @	1.13 @	1.18 @	1.34 @	39.60 @	8.30 @	39.90 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S2SA-01

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2SA-01-01-RM	0.91 J	0.99 J	1.03 J	0.99 J	3.62 J	7.80 -	15.70 -
A1P2-S2SA-01-02-RM	1.06 J	0.99 J	1.07 J	0.99 J	7.13 J	5.60 -	17.50 -
A1P2-S2SA-01-03-RM	0.91 J	0.93 J	0.97 J	0.93 J	4.92 J	5.90 -	16.20 -
A1P2-S2SA-01-06-RM	0.81 J	0.83 J	0.91 J	0.83 J	8.30 J	7.90 -	11.70 -
A1P2-S2SA-01-07-RM	1.09 J	1.01 J	1.05 J	1.01 J	41.60 J	5.30 -	21.70 -
A1P2-S2SA-01-08-RM	0.58 J	0.45 J	0.08 UJ	0.45 J	3.17 UJ	7.70 -	16.80 -
A1P2-S2SA-01-09-RM	0.92 J	1.08 J	1.11 J	1.08 J	59.10 J	6.20 -	17.60 -
A1P2-S2SA-01-09-RM-D	1.37 J	1.17 J	1.33 J	1.17 J	63.10 J	5.70 -	14.90 -
A1P2-S2SA-01-10-RM	1.28 J	1.19 J	1.26 J	1.19 J	23.90 J	6.00 -	14.80 -
A1P2-S2SA-01-12-RM	0.98 J	1.08 J	1.14 J	1.08 J	35.90 J	10.10 -	23.00 -
A1P2-S2SA-01-13-RM	1.18 J	1.25 J	1.33 J	1.25 J	38.30 J	8.50 -	36.80 -
A1P2-S2SA-01-14-RM	0.94 J	1.22 J	1.27 J	1.22 J	17.80 J	8.00 -	23.90 -
A1P2-S2SA-01-15-RM	1.18 J	1.29 J	1.44 J	1.29 J	47.60 J	12.30 -	14.70 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.37 @	1.29 @	1.44 @	1.29 @	63.10 @	12.30	36.80 @
Standardized Skewness	--	--	--	--	--	1.566	--
W-Statistic Probability*	--	--	--	--	--	38.9% (LN)	--
Test Procedure	--	--	--	--	--	t-Test (LN)	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	7.62	--
UCL on the Mean**	--	--	--	--	--	8.48	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	Pass	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	3	--
Size calculation	--	--	--	--	--	Pass	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S2SB-03

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2SB-03-01-RM	1.33 -	1.21 -	1.19 -	1.21 -	7.06 -	6.63 -	18.50 -
A1P2-S2SB-03-02-RM	1.44 -	1.18 -	1.14 -	1.18 -	8.02 -	8.13 -	18.50 -
A1P2-S2SB-03-04-RM	1.32 -	1.04 -	1.02 -	1.04 -	4.72 -	6.43 -	18.30 -
A1P2-S2SB-03-05-RM	1.20 -	1.02 -	1.01 -	1.02 -	15.58 -	5.15 -	20.20 -
A1P2-S2SB-03-06-RM	1.09 -	0.83 -	0.82 -	0.83 -	2.48 U	7.47 -	22.30 -
A1P2-S2SB-03-08-RM	1.36 -	1.21 -	1.19 -	1.21 -	6.80 -	4.22 -	19.70 -
A1P2-S2SB-03-09-RM	1.06 -	0.90 -	0.89 -	0.90 -	4.50 -	6.92 -	16.00 -
A1P2-S2SB-03-10-RM	1.20 -	1.03 -	1.02 -	1.03 -	6.92 -	7.01 -	16.60 -
A1P2-S2SB-03-11-RM	1.27 -	1.08 -	1.06 -	1.08 -	4.07 J	5.57 -	19.00 -
A1P2-S2SB-03-11-RM-D	1.33 -	1.16 -	1.13 -	1.16 -	4.71 -	6.29 -	19.50 -
A1P2-S2SB-03-14-RM	1.10 -	1.05 -	1.04 -	1.05 -	12.85 -	7.65 -	22.30 -
A1P2-S2SB-03-15-RM	1.22 -	1.03 -	0.99 -	1.03 -	2.29 U	5.92 -	17.80 -
A1P2-S2SB-03-16-RM	1.41 -	1.16 -	1.14 -	1.16 -	3.76 J	9.55 -	16.80 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.44 @	1.21 @	1.19 @	1.21 @	15.58 @	9.55 @	22.30 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S2SP-03

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2SP-03-01-RM	1.10 J	0.97 J	0.99 -	0.95 -	8.36 -	6.70 -	18.70 -
A1P2-S2SP-03-02-RM	1.31 J	1.15 J	1.18 -	1.14 -	16.41 -	6.00 -	22.60 -
A1P2-S2SP-03-03-RM	1.28 J	1.13 J	1.16 -	1.11 -	22.24 -	6.80 -	19.80 -
A1P2-S2SP-03-03-RM-D	1.17 J	1.11 J	1.15 J	1.10 J	20.86 J	6.40 -	17.40 -
A1P2-S2SP-03-05-RM	1.35 J	1.24 J	1.27 -	1.22 -	12.73 -	5.20 -	17.10 -
A1P2-S2SP-03-07-RM	1.34 J	1.12 J	1.14 -	1.11 -	9.96 -	7.70 -	21.20 -
A1P2-S2SP-03-08-RM	1.29 J	1.19 J	1.20 -	1.17 -	29.64 -	7.40 -	21.40 -
A1P2-S2SP-03-09-RM	1.30 J	1.17 J	1.19 -	1.15 -	14.47 -	7.80 -	19.50 -
A1P2-S2SP-03-11-RM	1.32 J	1.12 J	1.14 -	1.11 -	9.64 -	6.60 -	21.80 -
A1P2-S2SP-03-12-RM	1.46 J	1.18 J	1.21 -	1.17 -	9.86 -	7.50 -	17.00 -
A1P2-S2SP-03-13-RM	1.32 J	1.14 J	1.16 -	1.12 -	14.79 -	8.60 -	25.90 -
A1P2-S2SP-03-14-RM	1.19 J	1.15 J	1.17 -	1.14 -	24.30 -	6.80 -	19.70 -
A1P2-S2SP-03-15-RM	1.26 J	1.05 J	1.08 -	1.04 -	12.58 -	5.90 -	14.60 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.46 @	1.24 @	1.27 @	1.22 @	29.64 @	8.60 @	25.90 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3CD-01

Sample ID	PRIMARY COCs					SECONDARY COCs				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead
A1P2-S3CD-01-01-RM	1.16 -	0.85 -	0.83 -	0.85 -	3.56 J	1.45 U	4.04 J	7.84 J	0.04 U	19.60 -
A1P2-S3CD-01-03-RM	1.05 -	0.93 -	0.91 -	0.93 -	5.67 -	1.22 U	3.30 J	7.08 J	0.06 U	16.20 -
A1P2-S3CD-01-04-RM	1.37 -	0.98 -	0.97 -	0.98 -	3.09 U	1.52 U	2.85 J	12.50 J	1.46 -	26.10 -
A1P2-S3CD-01-05-RM	1.28 -	0.98 -	0.93 -	0.98 -	4.48 J	1.18 U	2.89 J	12.20 J	0.60 -	28.70 -
A1P2-S3CD-01-07-RM	1.25 -	0.91 -	0.89 -	0.91 -	6.59 -	1.37 U	3.35 J	7.43 J	0.10 U	23.60 -
A1P2-S3CD-01-08-RM	0.92 -	0.74 -	0.73 -	0.74 -	2.72 U	1.04 U	4.14 J	3.49 J	0.03 U	16.30 -
A1P2-S3CD-01-09-RM	1.06 -	0.78 -	0.74 -	0.78 -	2.86 U	1.33 U	4.14 J	4.98 J	0.04 U	18.60 -
A1P2-S3CD-01-09-RM-D	1.08 -	0.82 -	0.79 -	0.82 -	2.43 U	1.41 U	4.21 J	2.84 U	0.08 U	22.30 -
A1P2-S3CD-01-10-RM	0.94 -	0.81 -	0.81 -	0.80 -	2.63 U	1.47 U	4.23 J	7.34 J	0.03 U	15.20 -
A1P2-S3CD-01-12-RM	0.79 -	0.62 -	0.58 -	0.62 -	2.73 U	1.24 U	3.02 J	7.91 J	0.03 U	11.50 -
A1P2-S3CD-01-13-RM	1.05 -	0.75 -	0.72 -	0.75 -	2.93 J	1.25 U	3.76 J	11.70 J	0.32 U	24.00 -
A1P2-S3CD-01-15-RM	1.28 -	0.95 -	0.94 -	0.95 -	10.95 -	1.14 U	4.47 J	7.54 J	0.03 U	24.80 -
A1P2-S3CD-01-16-RM	1.10 -	0.81 -	0.77 -	0.81 -	2.83 U	1.43 U	4.39 J	11.40 J	0.08 U	15.60 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%
Max Result	1.37 @	0.98 @	0.97 @	0.98 @	10.95 @	1.52 U @	4.47 @	12.50	1.46 @	28.70 @
Standardized Skewness	--	--	--	--	--	--	--	0.057	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	17.1% (N)	--	--
Test Procedure	--	--	--	--	--	--	--	t-Test (N)	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--	8.45	--	--
UCL on the Mean**	--	--	--	--	--	--	--	9.59	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	Pass	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	4	--	--
Size calculation	--	--	--	--	--	--	--	Pass	--	--

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" " = no data qualifier
"NV" = not validated
"UNV" = not detected, not validated

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3CD-02

	PRIMARY COCs					SECONDARY COCs				
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead
A1P2-S3CD-02-01-RM	1.34 -	1.01 -	0.99 -	1.01 -	5.95 -	1.45 U	2.99 J	9.60 -	0.18 J	24.0 -
A1P2-S3CD-02-02-RM	1.18 -	0.80 -	0.79 -	0.80 -	5.88 -	1.54 U	2.45 J	6.68 -	0.07 J	20.2 -
A1P2-S3CD-02-04-RM	1.12 -	0.77 -	0.77 -	0.77 -	6.70 -	1.32 U	3.96 J	4.59 -	0.12 J	13.5 -
A1P2-S3CD-02-05-RM	1.45 -	1.09 -	1.06 -	1.09 -	4.85 J	1.63 U	2.56 J	6.68 -	0.64 J	27.5 -
A1P2-S3CD-02-06-RM	1.15 -	0.86 -	0.84 -	0.86 -	15.70 -	1.35 U	2.59 J	5.54 -	0.03 U	19.3 -
A1P2-S3CD-02-07-RM	1.08 -	0.88 -	0.87 -	0.88 -	15.87 -	1.57 U	2.54 J	6.85 -	0.09 J	24.0 -
A1P2-S3CD-02-09-RM	1.20 -	0.90 -	0.89 -	0.90 -	4.95 J	1.38 U	3.29 J	4.60 -	0.07 J	18.7 -
A1P2-S3CD-02-09-RM-D	1.16 -	0.87 -	0.86 -	0.87 -	3.07 U	1.44 U	2.52 J	6.41 -	0.21 J	19.8 -
A1P2-S3CD-02-11-RM	1.00 -	0.78 -	0.75 -	0.78 -	4.45 J	1.29 U	3.38 J	3.21 U	0.03 U	24.3 -
A1P2-S3CD-02-12-RM	0.91 -	0.77 -	0.77 -	0.77 -	2.91 U	1.64 U	3.71 J	7.87 -	0.03 U	15.6 -
A1P2-S3CD-02-13-RM	1.12 -	0.91 -	0.88 -	0.91 -	5.45 -	1.50 U	3.11 J	14.30 -	0.03 U	25.6 -
A1P2-S3CD-02-14-RM	1.22 -	1.07 -	1.03 -	1.07 -	40.36 -	1.66 U	1.97 J	8.00 -	0.03 U	30.4 -
A1P2-S3CD-02-16-RM	1.02 -	0.68 -	0.67 -	0.68 -	3.42 J	1.35 U	5.01 J	4.97 -	0.18 J	17.3 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%
Max Result	1.45 @	1.09 @	1.06 @	1.09 @	40.36 @	1.66 U @	5.01 @	14.30	0.64 @	30.40 @
Standardized Skewness	--	--	--	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3DP-01

	PRIMARY COCs					SECONDARY COCs								
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead	Molybdenum	Tetrachloroethene	Aroclor-1254	Aroclor-1260
A1P2-S3DP-01-01-RM	1.11 -	0.77 -	0.75 -	0.77 -	7.65 -	1.30 U	0.46 UJ	10.00 -	0.90 -	16.00 -	0.91 U	12.1 U	40.1 U	40.1 U
A1P2-S3DP-01-02-RM	1.09 -	0.86 -	0.86 -	0.86 -	8.98 -	1.26 U	0.47 UJ	6.40 -	0.63 -	14.10 -	1.10 U	12.4 U	39.9 U	39.9 U
A1P2-S3DP-01-04-RM	1.47 -	1.17 -	1.15 -	1.17 -	3.39 -	1.29 U	0.90 U	10.50 -	0.90 -	19.80 -	1.20 U	11.0 U	41.6 U	41.6 U
A1P2-S3DP-01-05-RM	1.00 J	0.85 -	0.82 -	0.85 -	10.56 -	1.30 U	0.45 UJ	5.40 -	0.57 -	188.00 J	0.72 U	13.2 U	39.0 U	39.0 U
A1P2-S3DP-01-05-RM-D	1.11 J	0.91 -	0.89 -	0.91 -	12.34 -	1.21 U	0.43 UJ	6.20 -	0.56 -	11.00 J	1.00 U	11.4 U	38.8 U	38.8 U
A1P2-S3DP-01-06-RM	1.23 -	0.96 -	0.93 -	0.96 -	3.11 -	1.27 U	0.45 UJ	9.00 -	0.98 -	16.40 -	0.80 U	13.1 U	37.5 U	37.5 U
A1P2-S3DP-01-07-RM	0.74 -	0.54 -	0.52 -	0.54 -	1.62 U	1.33 U	0.44 UJ	3.90 -	0.36 -	8.60 -	1.40 U	11.5 U	37.3 U	37.3 U
A1P2-S3DP-01-09-RM	0.85 -	0.71 -	0.70 -	0.71 -	2.06 J	1.17 U	0.42 UJ	3.50 -	0.52 -	9.10 -	1.70 U	12.5 U	39.0 U	39.0 U
A1P2-S3DP-01-09S-RM	0.84 -	0.69 -	0.69 -	0.69 -	5.07 -	1.22 U	0.49 UJ	3.90 -	0.49 U	9.80 -	1.30 U	13.9 U	46.3 U	46.3 U
A1P2-S3DP-01-10-RM	0.87 -	0.69 -	0.68 -	0.69 -	4.64 -	1.80 J	0.39 UJ	5.70 -	0.51 -	10.50 -	1.30 U	10.9 U	37.8 U	37.8 U
A1P2-S3DP-01-12-RM	0.87 -	0.68 -	0.66 -	0.68 -	3.52 -	1.33 U	0.43 UJ	3.40 -	0.55 -	8.90 -	1.50 U	12.1 U	37.9 U	37.9 U
A1P2-S3DP-01-12S-RM	0.89 -	0.66 -	0.63 -	0.66 -	3.99 -	1.38 U	0.50 UJ	13.20 -	0.55 -	12.90 -	1.30 U	13.3 U	45.6 U	45.6 U
A1P2-S3DP-01-14-RM	0.82 -	0.74 -	0.73 -	0.74 -	3.48 -	1.26 U	0.41 UJ	5.40 -	0.52 -	8.50 -	1.10 U	11.5 U	36.7 U	36.7 U
A1P2-S3DP-01-15-RM	0.87 -	0.67 -	0.66 -	0.67 -	1.90 U	1.33 U	0.44 UJ	4.10 -	0.46 U	9.00 -	1.50 U	11.9 U	40.5 U	40.5 U
A1P2-S3DP-01-15S-RM	0.97 -	0.78 -	0.77 -	0.78 -	5.15 -	1.38 U	0.74 UJ	5.20 -	0.75 U	12.40 -	1.60 U	21.8 UJ	65.4 U	65.4 U
A1P2-S3DP-01-16-RM	0.85 -	0.65 -	0.63 -	0.65 -	4.45 -	1.35 U	0.44 UJ	4.00 -	0.49 -	8.70 -	1.30 U	11.5 U	38.5 U	38.5 U
FRL	1.70	1.80	1.70	1.50	20.00	30.00	10.00	12.00	1.50	400.00	130.00	3600.0	130.0	130.0
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/kg	ug/kg	ug/kg
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max Result	1.47 @	1.17 @	1.15 @	1.17 @	12.34 @	1.80 @	0.90 U @	13.20	0.98 @	188.00 @	1.70 @	21.8 UJ @	65.4 U @	65.4 U @
Standardized Skewness	--	--	--	--	--	--	--	1.444	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	15.5% (LN)	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	t-Test (N)	--	--	--	--	--	--
Sample Size	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Estimated Mean	--	--	--	--	--	--	--	6.30	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	7.50	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	Pass	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	3	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	Pass	--	--	--	--	--	--

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

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

Appendix A: Certification Statistics for A1P2-S3DP-02

	PRIMARY COCs					SECONDARY COCs								
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead	Molybdenum	Tetrachloroethene	Aroclor-1254	Aroclor-1260
A1P2-S3DP-02-01-RM	1.11 -	0.81 -	0.80 -	0.81 -	7.03 -	1.73 U	0.98 U	9.10 -	0.74 -	19.80 J	1.20 U	11.7 U	38.4 U	38.4 U
A1P2-S3DP-02-03-RM	1.23 -	0.96 -	0.93 -	0.96 -	6.07 -	1.28 U	1.13 -	11.70 -	0.91 -	16.90 J	1.20 U	11.8 U	38.1 U	38.1 U
A1P2-S3DP-02-03-RM-D	1.21 -	0.93 -	0.91 -	0.93 -	5.38 -	1.24 U	3.90 -	8.50 -	0.77 -	12.30 J	0.88 U	12.0 U	38.6 U	38.6 U
A1P2-S3DP-02-04-RM	1.53 -	1.28 -	1.26 -	1.28 -	2.99 U	1.40 U	1.02 U	13.10 -	1.00 -	15.80 J	0.84 U	11.5 U	42.5 U	42.5 U
A1P2-S3DP-02-06-RM	1.28 -	1.00 -	1.01 -	1.00 -	8.20 -	1.32 U	1.04 U	7.00 U	0.42 U	17.40 J	0.93 U	11.7 U	40.1 U	40.1 U
A1P2-S3DP-02-07-RM	0.78 -	0.66 -	0.66 -	0.66 -	2.36 -	1.22 U	2.53 -	5.60 U	0.58 -	10.40 J	1.50 -	11.3 U	38.2 U	38.2 U
A1P2-S3DP-02-08-RM	0.85 -	0.77 -	0.78 -	0.77 -	3.50 J	1.31 U	3.04 -	6.70 U	0.62 -	10.70 J	1.00 U	11.4 U	38.3 U	38.3 U
A1P2-S3DP-02-09-RM	1.16 -	0.68 -	0.67 -	0.68 -	5.38 -	2.17 -	3.38 -	7.40 U	0.77 -	12.20 J	1.60 -	13.3 U	41.4 U	41.4 U
A1P2-S3DP-02-10-RM	0.72 -	0.66 -	0.67 -	0.66 -	2.66 J	1.16 U	1.90 -	5.80 U	0.55 U	10.00 J	1.40 -	2.9 J	39.4 U	39.4 U
A1P2-S3DP-02-10S-RM	0.88 -	0.68 -	0.66 -	0.68 -	3.97 -	1.39 U	3.77 -	6.40 U	0.63 U	9.20 J	1.00 U	5.4 J	48.5 U	48.5 U
A1P2-S3DP-02-11-RM	0.92 -	0.65 -	0.64 -	0.64 -	2.31 U	1.26 U	2.71 -	6.80 U	0.75 -	10.00 J	1.30 U	13.5 U	39.2 U	39.2 U
A1P2-S3DP-02-13-RM	0.83 -	0.85 -	0.84 -	0.85 -	2.51 J	1.22 U	2.99 -	6.00 U	0.76 -	10.70 J	1.70 -	8.9 J	38.1 U	38.1 U
A1P2-S3DP-02-14-RM	1.54 -	1.22 -	1.21 -	1.22 -	5.18 -	1.10 J	1.76 -	8.90 -	1.10 -	14.80 J	0.30 U	12.6 U	42.1 U	42.1 U
A1P2-S3DP-02-16-RM	1.53 -	1.16 -	1.16 -	1.16 -	4.54 J	1.15 U	1.65 -	12.30 -	0.90 -	13.10 J	0.80 U	12.8 U	41.1 U	41.1 U
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00	130.00	3600.0	130.0	130.0
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/kg	ug/kg	ug/kg
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Max Result	1.54 @	1.28 @	1.26 @	1.28 @	8.20 @	2.17 @	3.90 @	13.10	1.10 @	19.80 @	1.70 @	8.9 @	48.5 U @	48.5 U @
Standardized Skewness	--	--	--	--	--	--	--	1.035	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	< 1% (LN)	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	Proportions	--	--	--	--	--	--
Sample Size	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Estimated Mean	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	1.33%	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	Pass	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	8	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	Pass	--	--	--	--	--	--

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

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

000121

Appendix A: Certification Statistics for A1P2-S3HR-01

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S3HR-01-01B-RM	0.89 J	0.74 -	0.71 -	0.74 -	5.02 -	5.76 -	16.50 -
A1P2-S3HR-01-02B-RM	1.28 J	1.12 -	1.10 -	1.12 -	16.52 -	2.85 U	21.70 -
A1P2-S3HR-01-04B-RM	1.42 J	1.26 -	1.22 -	1.26 -	15.10 -	5.51 -	24.70 -
A1P2-S3HR-01-05B-RM	1.47 J	1.25 -	1.23 -	1.25 -	2.92 U	2.95 U	20.60 -
A1P2-S3HR-01-06B-RM	1.42 J	0.94 -	0.93 -	0.94 -	20.73 -	4.72 -	27.60 -
A1P2-S3HR-01-08B-RM	1.18 J	0.91 -	0.90 -	0.91 -	16.74 -	3.90 -	13.80 -
A1P2-S3HR-01-09B-RM	1.20 J	1.18 -	1.20 -	1.18 -	20.99 -	3.64 -	29.20 -
A1P2-S3HR-01-10B-RM	1.43 J	1.21 -	1.18 -	1.21 -	3.47 J	6.23 -	20.40 -
A1P2-S3HR-01-12B-RM	1.50 J	1.18 -	1.16 -	1.18 -	30.42 J	2.98 U	21.30 -
A1P2-S3HR-01-12B-RM-D	1.33 J	1.13 -	1.11 -	1.13 -	23.17 J	5.82 J	25.20 -
A1P2-S3HR-01-14B-RM	1.24 J	0.98 -	0.99 -	0.98 -	12.33 -	3.24 -	25.10 -
A1P2-S3HR-01-15B-RM	1.10 J	0.95 -	0.92 -	0.95 -	25.37 -	2.92 U	23.60 -
A1P2-S3HR-01-16B-RM	1.28 J	1.06 -	1.04 -	1.06 -	14.17 -	2.98 U	24.20 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.50 @	1.26 @	1.23 @	1.26 @	30.42 @	6.23 @	29.20 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3HR-02

	PRIMARY COCs					SECONDARY COCs	
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S3HR-02-01B-RM	1.26 -	0.84 -	0.79 -	0.84 -	2.90 J	4.28 J	21.40 -
A1P2-S3HR-02-02B-RM	1.20 -	0.97 -	0.95 -	0.97 -	4.62 -	4.07 J	17.90 -
A1P2-S3HR-02-03B-RM	1.28 -	0.97 -	0.95 -	0.97 -	10.57 -	8.73 J	20.80 -
A1P2-S3HR-02-05B-RM	1.18 -	0.96 -	0.94 -	0.96 -	20.27 -	4.92 J	19.30 -
A1P2-S3HR-02-06B-RM	1.09 -	0.95 -	0.96 -	0.95 -	16.23 -	5.95 J	20.40 -
A1P2-S3HR-02-08B-RM	1.37 -	1.12 -	1.07 -	1.12 -	2.89 U	5.85 J	22.20 -
A1P2-S3HR-02-09B-RM	1.42 -	1.12 -	1.07 -	1.12 -	3.26 U	4.69 J	20.60 -
A1P2-S3HR-02-10B-RM	1.40 -	1.09 -	1.07 -	1.09 -	3.17 U	3.12 U	21.60 -
A1P2-S3HR-02-12B-RM	1.20 -	1.03 -	1.00 -	1.03 -	5.61 -	4.78 J	18.10 -
A1P2-S3HR-02-13B-RM	1.20 -	1.01 -	0.99 -	1.01 -	4.47 -	4.17 J	20.80 -
A1P2-S3HR-02-13B-RM-D	1.28 -	1.05 -	1.05 -	1.05 -	5.15 -	5.90 J	21.30 -
A1P2-S3HR-02-15B-RM	0.79 -	0.69 -	0.67 -	0.69 -	2.60 U	4.88 J	11.30 -
A1P2-S3HR-02-16B-RM	1.38 -	1.06 -	1.04 -	1.06 -	3.12 U	3.91 J	20.60 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.42 @	1.12 @	1.07 @	1.12 @	20.27 @	8.73 @	22.20 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
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"UNV" = not detected, not validated

NOTES:

(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

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

(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.

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

Appendix A: Certification Statistics for A1P2-S3HR-03

Sample ID	PRIMARY COCs					SECONDARY COCs				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead
A1P2-S3HR-03-01B-RM	1.22 J	0.93 J	0.88 J	0.93 J	13.29 J	1.46 U	3.84 J	11.00 -	0.26 -	19.80 -
A1P2-S3HR-03-02B-RM	1.12 -	0.93 -	0.93 -	0.93 -	11.24 -	1.43 U	2.16 J	6.31 -	0.25 -	15.30 -
A1P2-S3HR-03-02B-RM-D	1.19 -	0.98 -	0.97 -	0.98 -	13.47 -	1.37 U	2.85 J	5.90 -	0.42 -	12.10 -
A1P2-S3HR-03-03B-RM	1.12 -	0.83 -	0.83 -	0.83 -	19.05 -	1.41 U	2.46 J	3.35 U	0.30 -	19.00 -
A1P2-S3HR-03-05B-RM	1.04 -	0.85 -	0.83 -	0.85 -	3.98 J	1.31 U	2.17 J	5.14 -	0.46 -	13.30 -
A1P2-S3HR-03-06B-RM	0.99 -	0.89 -	0.88 -	0.89 -	5.11 -	1.44 U	2.55 J	8.14 -	0.29 -	15.10 -
A1P2-S3HR-03-07B-RM	1.29 -	1.15 -	1.13 -	1.15 -	38.43 -	1.52 U	1.05 UJ	4.48 -	0.24 -	23.00 -
A1P2-S3HR-03-09B-RM	1.15 -	1.10 -	1.08 -	1.07 -	17.37 -	1.45 U	1.22 UJ	5.24 -	0.17 -	18.10 -
A1P2-S3HR-03-10B-RM	1.21 -	1.10 -	1.11 -	1.10 -	37.34 -	1.31 U	1.14 UJ	5.43 -	0.21 -	19.70 -
A1P2-S3HR-03-11B-RM	1.42 -	1.44 -	1.46 -	1.44 -	16.42 -	1.39 U	1.31 UJ	4.84 -	0.19 -	13.00 -
A1P2-S3HR-03-12B-RM	1.40 -	1.21 -	1.18 -	1.21 -	5.39 -	1.43 U	1.18 J	6.23 -	0.58 -	16.00 -
A1P2-S3HR-03-13B-RM	1.13 -	1.18 -	1.19 -	1.18 -	40.03 -	1.39 U	1.05 UJ	7.09 -	0.13 -	17.60 -
A1P2-S3HR-03-14B-RM	1.16 -	1.09 -	1.06 -	1.09 -	33.44 -	1.48 U	1.10 UJ	6.43 -	0.16 -	23.00 -
A1P2-S3HR-03-16B-RM	1.29 -	1.00 -	0.97 -	1.00 -	3.27 U	1.41 U	1.59 J	8.84 -	0.45 -	17.50 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%
Max Result	1.42 @	1.44 @	1.46 @	1.44 @	40.03 @	1.52 U @	3.84 @	11.00 @	0.58 @	23.00 @
Standardized Skewness	--	--	--	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--
Sample Size	13	13	13	13	13	13	13	13	13	13
Estimated Mean	--	--	--	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

000124

Appendix A: Certification Statistics for A1P2-S3HR-04

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S3HR-04-01-RM	1.27 -	0.84 -	0.81 -	0.84 -	14.32 -	7.80 -	22.80 -
A1P2-S3HR-04-02-RM	1.36 -	1.01 -	1.00 -	1.01 -	18.10 -	7.57 -	17.40 -
A1P2-S3HR-04-03-RM	1.07 -	0.82 -	0.81 -	0.82 -	9.38 -	6.02 -	15.30 -
A1P2-S3HR-04-05-RM	1.39 -	1.09 -	1.01 -	1.09 -	23.37 -	7.27 -	24.80 -
A1P2-S3HR-04-06-RM	1.34 -	1.02 -	1.00 -	1.02 -	22.13 -	5.57 -	18.70 -
A1P2-S3HR-04-08-RM	1.25 -	1.02 -	0.99 -	1.02 -	12.42 -	4.21 -	19.40 -
A1P2-S3HR-04-09-RM	1.20 -	0.93 -	0.92 -	0.93 -	25.49 -	3.99 -	21.70 -
A1P2-S3HR-04-11-RM	0.96 -	0.79 -	0.73 -	0.79 -	2.77 U	5.96 -	13.10 -
A1P2-S3HR-04-12-RM	1.28 -	1.07 -	1.03 -	1.07 -	12.60 -	6.89 -	16.90 -
A1P2-S3HR-04-13-RM	0.91 -	0.72 -	0.70 -	0.72 -	10.22 -	7.15 -	17.10 -
A1P2-S3HR-04-14-RM	1.43 J	0.92 -	0.90 -	0.92 -	11.82 J	3.88 J	12.40 -
A1P2-S3HR-04-14-RM-D	1.24 J	0.87 -	0.85 -	0.87 -	8.09 J	7.35 J	20.70 -
A1P2-S3HR-04-16-RM	1.40 -	1.02 -	0.98 -	1.02 -	7.92 -	3.76 -	18.50 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.43 @	1.09 @	1.03 @	1.09 @	25.49 @	7.80 @	24.80 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
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NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3HR-05

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S3HR-05-01B-RM	1.24 -	1.04 -	1.04 -	1.04 -	3.72 J	8.19 J	14.90 -
A1P2-S3HR-05-03B-RM	1.23 -	0.98 -	0.98 -	0.98 -	3.08 J	3.37 U	10.20 -
A1P2-S3HR-05-04B-RM	1.23 -	1.00 -	0.98 -	1.00 -	8.63 -	3.07 U	11.20 -
A1P2-S3HR-05-05B-RM	1.35 -	1.23 -	1.22 -	1.23 -	5.78 J	4.15 J	14.50 -
A1P2-S3HR-05-06B-RM	1.39 -	1.05 -	1.04 -	1.05 -	2.99 U	6.98 J	17.00 -
A1P2-S3HR-05-06B-RM-D	1.27 -	1.09 -	1.07 -	1.09 -	3.70 J	3.11 U	14.00 -
A1P2-S3HR-05-07B-RM	1.24 -	1.07 -	1.05 -	1.07 -	3.01 U	4.77 J	14.60 -
A1P2-S3HR-05-09B-RM	1.34 -	1.17 -	1.14 -	1.17 -	2.87 U	7.43 J	12.40 -
A1P2-S3HR-05-10B-RM	1.27 -	1.06 -	1.04 -	1.06 -	19.01 -	3.50 J	18.20 -
A1P2-S3HR-05-12B-RM	1.25 -	0.96 -	0.97 -	0.96 -	3.10 J	3.60 J	14.00 -
A1P2-S3HR-05-13B-RM	0.85 -	0.74 -	0.72 -	0.74 -	3.18 J	4.94 J	10.30 -
A1P2-S3HR-05-14B-RM	0.97 -	0.80 -	0.80 -	0.80 -	3.18 U	4.88 J	11.70 -
A1P2-S3HR-05-15B-RM	0.87 -	0.77 -	0.75 -	0.77 -	2.45 J	4.75 J	15.20 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.39 @	1.23 @	1.22 @	1.23 @	19.01 @	8.19 @	18.20 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
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NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3HW-01

	PRIMARY COCs					SECONDARY COCs						
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead	Molybdenum	Tetrachloroethene
A1P2-S3HW-01-01-RM	1.41 -	1.09 -	1.11 -	1.09 -	4.24 U	1.79 J	0.47 UJ	10.20 -	0.78 -	13.70 -	1.40 U	68.7 -
A1P2-S3HW-01-02-RM	1.08 -	0.99 -	1.02 -	0.99 -	11.74 J	1.08 -	0.51 U	8.50 -	0.71 -	12.60 -	1.50 U	13.3 U
A1P2-S3HW-01-03-RM	1.17 -	0.96 -	0.97 -	0.96 -	3.53 J	2.03 U	0.78 U	12.10 -	0.80 -	19.20 -	1.70 U	12.2 U
A1P2-S3HW-01-04-RM	1.21 -	0.99 -	0.97 -	0.99 -	5.97 -	1.33 U	0.48 UJ	4.70 -	0.78 -	10.80 -	1.00 U	12.3 U
A1P2-S3HW-01-05-RM	1.07 -	0.72 -	0.72 -	0.72 -	9.16 -	2.32 U	0.45 UJ	6.90 -	0.57 -	12.20 -	1.30 U	12.4 U
A1P2-S3HW-01-06-RM	1.27 -	0.86 -	0.84 -	0.86 -	6.26 -	1.86 U	0.46 UJ	4.80 -	0.59 -	8.20 -	1.10 U	11.3 U
A1P2-S3HW-01-07-RM	0.91 -	1.03 -	1.01 -	1.03 -	3.84 J	1.39 U	0.42 UJ	3.30 -	0.71 -	8.20 -	0.92 U	12.6 U
A1P2-S3HW-01-08-RM	0.94 -	0.75 -	0.76 -	0.75 -	2.37 U	1.35 U	0.42 UJ	4.30 -	0.58 -	8.70 -	1.10 U	11.6 U
A1P2-S3HW-01-09-RM	1.13 -	0.85 -	0.85 -	0.85 -	6.07 -	2.13 -	0.83 U	7.90 -	0.81 -	13.70 -	1.50 U	1.3 J
A1P2-S3HW-01-10-RM	1.00 -	0.83 -	0.84 -	0.83 -	8.79 UJ	1.30 U	0.43 UJ	5.00 -	0.56 -	10.80 -	1.10 U	12.2 U
A1P2-S3HW-01-11-RM	1.05 -	0.93 -	0.91 -	0.93 -	5.94 -	2.56 -	0.55 U	6.50 -	0.62 -	12.50 -	1.10 U	12.7 U
A1P2-S3HW-01-12-RM	1.53 -	0.92 -	0.88 -	0.92 -	4.90 J	1.30 U	1.20 U	18.90 -	0.84 -	25.40 -	0.97 U	13.7 U
A1P2-S3HW-01-13-RM	1.56 -	1.30 -	1.26 -	1.30 -	5.68 -	1.58 U	0.91 U	12.60 -	1.00 -	18.30 -	1.30 U	11.9 U
A1P2-S3HW-01-14-RM	0.85 -	0.74 -	0.73 -	0.74 -	8.65 UJ	1.36 U	0.45 UJ	4.50 -	0.56 -	8.60 -	1.30 U	11.9 U
A1P2-S3HW-01-15-RM	0.91 -	0.80 -	0.77 -	0.80 -	8.05 UJ	1.38 U	0.43 UJ	3.50 -	0.59 -	8.10 -	0.91 U	11.2 U
A1P2-S3HW-01-16-RM	1.17 -	0.82 -	0.79 -	0.82 -	17.94 -	1.34 U	0.41 UJ	6.60 -	0.59 -	11.40 -	1.60 U	11.6 U
A1P2-S3HW-01-16-RM-D	1.11 -	0.75 -	0.76 -	0.75 -	18.56 -	1.39 U	0.46 UJ	5.90 -	0.58 -	10.20 -	1.10 U	11.8 U
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00	130.00	3600.0
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/kg
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%	90%
Max Result	1.56 @	1.30 @	1.26 @	1.30 @	18.56 @	2.56 @	1.20 U @	18.90	1.00 @	25.40 @	1.70 U @	68.7 @
Standardized Skewness	--	--	--	--	--	--	--	1.867	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	60.8% (LN)	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	t-Test (LN)	--	--	--	--
Sample Size	16	16	16	16	16	16	16	16	16	16	16	16
Estimated Mean	--	--	--	--	--	--	--	7.52	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	9.14	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	Pass	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	5	--	--	--	--
Size calculation	--	--	--	--	--	--	--	Pass	--	--	--	--

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

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

Appendix A: Certification Statistics for A1P2-S3NI-01

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S3NI-01-02-RM	1.16 -	0.93 J	0.92 -	0.93 J	6.72 -	5.74 -	23.60 -
A1P2-S3NI-01-03-RM	1.01 -	0.78 -	0.77 -	0.78 -	3.29 U	3.04 -	12.40 -
A1P2-S3NI-01-04-RM	0.72 -	0.60 -	0.58 -	0.60 -	2.43 U	2.60 U	12.90 -
A1P2-S3NI-01-06-RM	1.38 -	1.06 -	1.03 -	1.06 -	3.89 J	13.60 -	25.80 -
A1P2-S3NI-01-07-RM	1.38 -	1.07 -	1.07 -	1.07 -	4.25 -	10.30 -	24.70 -
A1P2-S3NI-01-08-RM	1.04 -	0.87 -	0.85 -	0.87 -	2.72 U	6.92 -	15.50 -
A1P2-S3NI-01-09-RM	0.94 -	0.80 -	0.79 -	0.80 -	2.86 U	5.58 -	39.20 -
A1P2-S3NI-01-11-RM	0.83 -	0.55 -	0.54 -	0.55 -	2.65 U	3.29 -	12.50 -
A1P2-S3NI-01-12-RM	0.89 -	0.77 -	0.77 -	0.77 -	3.06 U	3.69 -	15.50 -
A1P2-S3NI-01-13-RM	1.16 -	1.07 -	1.04 -	1.07 -	8.03 -	2.95 U	19.00 -
A1P2-S3NI-01-14-RM	1.11 -	0.96 -	0.95 -	0.96 -	16.16 -	3.91 -	22.60 -
A1P2-S3NI-01-16-RM	1.12 -	0.90 J	0.87 J	0.90 J	15.28 -	7.04 J	20.30 -
A1P2-S3NI-01-16-RM-D	1.15 -	1.04 J	1.06 J	1.04 J	16.06 -	3.12 U	24.20 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.38 @	1.07 @	1.07 @	1.07 @	16.16 @	13.60	39.20 @
Standardized Skewness	--	--	--	--	--	1.561	--
W-Statistic Probability*	--	--	--	--	--	75.5% (LN)	--
Test Procedure	--	--	--	--	--	t-Test (LN)	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	5.71	--
UCL on the Mean**	--	--	--	--	--	8.30	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	Pass	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	4	--
Size calculation	--	--	--	--	--	Pass	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3NI-02

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S3NI-02-01-RM	1.07 J	0.94 J	1.05 J	0.94 J	22.60 J	6.10 -	26.40 -
A1P2-S3NI-02-02-RM	1.11 J	1.01 J	0.94 J	1.01 J	9.45 J	5.10 -	20.80 -
A1P2-S3NI-02-04-RM	1.23 J	1.07 J	1.16 J	1.07 J	13.30 J	7.90 -	30.50 -
A1P2-S3NI-02-05-RM	1.02 J	1.01 J	1.11 J	1.02 J	28.70 J	6.20 -	32.10 -
A1P2-S3NI-02-06-RM	1.29 J	1.11 J	1.10 J	1.11 J	31.20 J	5.60 -	38.30 -
A1P2-S3NI-02-07-RM	1.33 J	1.19 J	1.23 J	1.19 J	14.30 J	7.60 -	19.80 -
A1P2-S3NI-02-09-RM	1.15 J	0.89 J	0.98 J	0.89 J	27.20 J	8.30 -	43.00 -
A1P2-S3NI-02-11-RM	0.88 J	0.94 J	1.03 J	0.94 J	21.50 J	7.50 -	27.00 -
A1P2-S3NI-02-11-RM-D	1.12 J	1.00 J	1.10 J	1.00 J	23.60 J	8.50 -	26.10 -
A1P2-S3NI-02-12-RM	1.05 J	1.00 J	1.09 J	0.99 J	48.00 J	7.30 -	32.70 -
A1P2-S3NI-02-13-RM	0.97 J	0.86 J	0.93 J	0.86 J	4.66 J	8.00 -	15.90 -
A1P2-S3NI-02-14-RM	1.01 J	0.95 J	0.99 J	0.95 J	6.13 J	8.90 -	15.70 -
A1P2-S3NI-02-15-RM	1.07 J	1.15 J	1.20 J	1.15 J	54.20 J	6.90 -	26.00 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.33 @	1.19 @	1.23 @	1.19 @	54.20 @	8.90 @	43.00 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3NI-03

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S3NI-03-01-RM	1.15 J	0.83 -	0.82 -	0.83 -	12.13 -	8.20 -	24.70 -
A1P2-S3NI-03-03-RM	0.99 J	1.07 -	1.08 -	1.06 -	13.33 -	7.50 -	20.00 -
A1P2-S3NI-03-04-RM	1.13 J	1.00 -	1.03 -	0.99 -	26.26 -	7.80 -	19.20 -
A1P2-S3NI-03-05-RM	1.24 J	1.15 -	1.17 -	1.14 -	29.68 -	9.90 J	26.10 -
A1P2-S3NI-03-05-RM-D	1.18 J	1.09 -	1.12 -	1.08 -	26.69 -	5.10 J	16.00 -
A1P2-S3NI-03-06-RM	1.38 J	1.05 -	1.07 -	1.04 -	11.76 -	8.50 -	18.70 -
A1P2-S3NI-03-08-RM	1.24 J	1.15 -	1.17 -	1.14 -	14.17 -	6.00 -	26.10 -
A1P2-S3NI-03-09-RM	1.10 J	0.97 -	1.02 -	0.96 -	28.67 -	8.50 -	19.00 -
A1P2-S3NI-03-11-RM	1.28 J	1.00 -	1.02 -	0.99 -	5.12 -	6.80 -	22.00 -
A1P2-S3NI-03-12-RM	1.10 J	0.88 -	0.89 -	0.87 -	9.58 -	8.70 -	20.40 -
A1P2-S3NI-03-13-RM	1.26 J	1.09 -	1.11 -	1.08 -	30.89 -	10.00 -	21.80 -
A1P2-S3NI-03-14-RM	1.50 J	1.24 -	1.26 -	1.23 -	33.66 -	8.00 -	26.90 -
A1P2-S3NI-03-15-RM	1.14 J	1.03 -	1.06 -	1.02 -	38.93 -	7.10 -	13.40 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.50 @	1.24 @	1.26 @	1.23 @	38.93 @	10.00 @	26.90 @
Standardized Skewness	- -	- -	- -	- -	- -	- -	- -
W-Statistic Probability*	- -	- -	- -	- -	- -	- -	- -
Test Procedure	- -	- -	- -	- -	- -	- -	- -
Sample Size	12	12	12	12	12	12	12
Estimated Mean	- -	- -	- -	- -	- -	- -	- -
UCL on the Mean**	- -	- -	- -	- -	- -	- -	- -
Non-Parametric Prob.	- -	- -	- -	- -	- -	- -	- -
Est. Mean - Pass / Fail	- -	- -	- -	- -	- -	- -	- -
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	- -	- -	- -	- -	- -	- -	- -

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

000130

Appendix B: Certification Statistics for A1P2-S3NI-04

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S3NI-04-02-RM	0.89 J	0.77 J	0.79 J	0.77 J	10.70 J	5.90 -	19.80 J
A1P2-S3NI-04-03-RM	1.08 J	0.82 J	0.83 J	0.82 J	21.70 J	6.40 -	16.10 J
A1P2-S3NI-04-03-RM-D	1.06 J	0.80 J	0.86 J	0.80 J	23.70 J	6.20 -	23.50 J
A1P2-S3NI-04-04-RM	1.11 J	0.93 J	1.01 J	0.93 J	17.50 J	8.10 -	23.50 J
A1P2-S3NI-04-05-RM	1.11 J	0.94 J	1.03 J	0.94 J	16.90 J	8.90 -	21.80 J
A1P2-S3NI-04-06-RM	0.83 J	0.76 J	0.82 J	0.76 J	11.00 J	5.90 -	15.20 J
A1P2-S3NI-04-07-RM	1.34 J	1.01 J	1.11 J	1.01 J	45.70 J	8.10 -	39.30 J
A1P2-S3NI-04-09-RM	1.14 J	0.99 J	1.13 J	0.99 J	23.10 J	11.60 -	24.30 J
A1P2-S3NI-04-10-RM	0.68 J	0.73 J	0.80 J	0.73 J	15.20 J	6.60 -	26.40 J
A1P2-S3NI-04-11-RM	1.17 J	1.09 J	1.21 J	1.09 J	34.70 J	7.00 -	52.00 J
A1P2-S3NI-04-13-RM	0.92 J	0.77 J	0.80 J	0.77 J	4.86 J	6.90 -	13.20 J
A1P2-S3NI-04-15-RM	0.96 J	0.93 J	0.83 J	0.93 J	14.00 J	7.40 -	22.80 J
A1P2-S3NI-04-16-RM	0.88 J	0.96 J	1.13 J	0.96 J	18.90 J	7.20 -	17.40 J
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.34 @	1.09 @	1.21 @	1.09 @	45.70 @	11.60 @	52.00 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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

NOTES:

(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

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

(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.

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

Appendix A: Certification Statistics for A1P2-S2NI-05

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2NI-05-01-RM	1.44 J	1.21 J	0.94 J	1.21 J	5.50 J	8.40 -	18.20 J
A1P2-S2NI-05-02-RM	1.23 J	1.26 J	0.98 J	1.26 J	17.70 J	6.70 -	16.00 J
A1P2-S2NI-05-03-RM	1.05 J	1.05 J	1.12 J	1.05 J	23.00 J	7.40 -	22.30 J
A1P2-S2NI-05-04-RM	1.41 -	1.22 -	1.25 -	1.22 -	13.42 -		
A1P2-S2NI-05-05-RM	1.14 J	1.02 J	1.09 J	1.02 J	9.66 J	7.70 -	20.30 J
A1P2-S2NI-05-06-RM	1.17 J	1.21 J	0.95 J	1.21 J	8.85 J	8.60 -	17.20 J
A1P2-S2NI-05-07-RM	1.31 -	1.31 -	1.30 -	1.31 -	45.20 -		
A1P2-S2NI-05-08-RM	1.20 J	1.31 J	1.44 J	1.31 J	52.20 J	10.20 -	32.60 J
A1P2-S2NI-05-08-RM-D	1.53 J	1.39 J	1.42 J	1.39 J	39.60 J	7.90 -	26.10 J
A1P2-S2NI-05-09-RM	1.27 -	1.18 -	1.17 -	1.18 -	36.93 -		
A1P2-S2NI-05-10-RM	1.31 J	2.53 J	0.95 J	1.31 J	12.80 J	11.70 -	22.30 J
A1P2-S2NI-05-11-RM	1.26 J	1.32 J	1.55 J	1.32 J	64.90 J	6.20 -	22.60 J
A1P2-S2NI-05-12-RM	1.26 J	1.35 J	1.33 J	1.35 J	55.00 J	6.50 -	22.20 J
A1P2-S2NI-05-13-RM	1.45 J	1.49 J	1.67 J	1.49 J	54.70 J	9.00 -	26.70 J
A1P2-S2NI-05-14-RM	1.28 -	1.18 -	1.18 -	1.18 -	39.70 -		
A1P2-S2NI-05-15-RM	1.23 J	1.51 J	1.38 J	1.51 J	62.60 J	6.60 -	22.30 J
A1P2-S2NI-05-16-RM	1.17 J	1.47 J	1.21 J	1.47 J	63.10 J	7.20 -	23.70 J
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.53 @	2.53	1.67 @	1.51	64.90 @	11.70 @	32.60 @
Standardized Skewness	--	3.530	--	-0.084	--	--	--
W-Statistic Probability*	--	< 1% (LN)	--	63.0% (N)	--	--	--
Test Procedure	--	Median	--	t-Test (N)	--	--	--
Sample Size	16	16	16	16	16	12	12
Estimated Mean	--	1.28	--	1.28	--	--	--
UCL on the Mean**	--	1.39	--	1.34	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	Pass	--	Pass	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size	--	6	--	4	--	--	--
calculation	--	Pass	--	Pass	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3NI-06

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S3NI-06-01-RM	1.07 J	1.21 J	1.23 -	1.20 -	43.40 -	10.20 -	26.30 J
A1P2-S3NI-06-02-RM	0.98 J	1.25 J	1.25 -	1.23 -	55.47 -	7.80 -	27.60 J
A1P2-S3NI-06-03-RM	1.00 J	1.25 J	1.28 -	1.24 -	57.01 -	8.20 -	28.80 J
A1P2-S3NI-06-05-RM	1.31 J	1.28 J	1.33 J	1.26 J	20.61 J	8.60 -	27.70 J
A1P2-S3NI-06-06-RM	1.33 J	1.25 J	1.29 -	1.23 -	4.87 -	9.00 -	21.30 J
A1P2-S3NI-06-07-RM	1.17 J	1.07 J	1.09 -	1.06 -	21.54 -	5.20 -	19.80 J
A1P2-S3NI-06-09-RM	1.35 J	1.26 J	1.31 -	1.25 -	44.85 -	8.90 -	26.60 J
A1P2-S3NI-06-11-RM	1.14 J	1.09 J	1.12 -	1.08 -	6.35 -	9.50 -	17.00 J
A1P2-S3NI-06-12-RM	1.29 J	1.24 J	1.27 -	1.22 -	10.68 -	10.30 -	23.10 J
A1P2-S3NI-06-14-RM	0.50 J	0.34 J	0.34 -	0.33 -	3.43 J	2.30 -	3.80 J
A1P2-S3NI-06-15-RM	0.96 J	1.14 J	1.16 -	1.13 -	27.99 -	12.40 -	32.10 J
A1P2-S3NI-06-16-RM	0.64 J	0.56 J	0.57 J	0.56 J	7.43 J	7.30 -	19.60 J
A1P2-S3NI-06-16-RM-D	1.23 J	1.13 J	1.17 J	1.12 J	14.59 J	6.70 -	18.40 J
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.35 @	1.28 @	1.33 @	1.26 @	57.01 @	12.40	32.10 @
Standardized Skewness	- -	- -	- -	- -	- -	-1.448	- -
W-Statistic Probability*	- -	- -	- -	- -	- -	31.1% (N)	- -
Test Procedure	- -	- -	- -	- -	- -	t-Test (N)	- -
Sample Size	12	12	12	12	12	12	12
Estimated Mean	- -	- -	- -	- -	- -	8.31	- -
UCL on the Mean**	- -	- -	- -	- -	- -	9.33	- -
Non-Parametric Prob.	- -	- -	- -	- -	- -	- -	- -
Est. Mean - Pass / Fail	- -	- -	- -	- -	- -	Pass	- -
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	- -	- -	- -	- -	- -	4	- -
Size calculation	- -	- -	- -	- -	- -	Pass	- -

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3NI-07

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S3NI-07-01-RM	0.93 J	0.97 -	0.98 -	0.96 -	6.15 -	6.40 -	28.00 -
A1P2-S3NI-07-02-RM	1.38 J	1.05 -	1.06 -	1.04 -	5.46 -	6.70 -	48.90 -
A1P2-S3NI-07-04-RM	1.36 J	1.16 -	1.18 -	1.15 -	3.82 -	4.60 -	37.90 -
A1P2-S3NI-07-05-RM	1.31 J	1.10 J	1.12 J	1.09 J	5.66 -	7.80 J	29.10 -
A1P2-S3NI-07-05-RM-D	1.08 J	0.92 J	0.93 J	0.91 J	5.15 -	5.20 J	26.60 -
A1P2-S3NI-07-07-RM	1.12 J	0.95 J	0.97 J	0.94 J	3.72 J	6.30 -	23.80 -
A1P2-S3NI-07-08-RM	1.17 J	1.04 -	1.02 -	1.03 -	5.43 -	5.40 -	20.50 -
A1P2-S3NI-07-09-RM	0.96 J	0.96 -	0.98 -	0.95 -	5.45 -	7.70 -	20.60 -
A1P2-S3NI-07-10-RM	1.00 J	1.01 -	1.04 -	1.00 -	5.36 -	6.00 -	178.00 -
A1P2-S3NI-07-12-RM	1.13 J	1.14 -	1.18 -	1.13 -	8.82 -	4.70 -	29.40 -
A1P2-S3NI-07-13-RM	1.21 J	1.04 -	1.06 -	1.03 -	8.13 -	5.60 -	27.80 -
A1P2-S3NI-07-14-RM	1.30 J	1.06 -	1.10 -	1.05 -	7.39 -	3.50 -	25.70 -
A1P2-S3NI-07-15-RM	0.78 J	0.87 -	0.88 -	0.86 -	8.34 -	4.90 -	23.40 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.38 @	1.16 @	1.18 @	1.15 @	8.82 @	7.80 @	178.00 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3SA-01

Sample ID	PRIMARY COCs					SECONDARY COCs				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead
A1P2-S3SA-01-01-RM	1.18 -	1.07 -	1.04 -	1.07 -	10.51 -	1.41 U	2.05 UJ	6.47 J	0.59 -	25.40 -
A1P2-S3SA-01-02-RM	1.33 -	1.04 -	1.02 -	1.04 -	5.71 -	1.54 U	1.34 UJ	10.30 J	0.39 -	18.80 -
A1P2-S3SA-01-04-RM	1.27 -	1.10 -	1.08 -	1.10 -	15.15 -	1.43 U	2.81 UJ	9.65 J	0.64 -	22.00 -
A1P2-S3SA-01-05-RM	1.42 -	1.08 -	1.06 -	1.08 -	4.47 J	1.56 U	2.11 UJ	9.94 J	0.87 -	23.90 -
A1P2-S3SA-01-07-RM	1.33 -	1.13 -	1.10 -	1.13 -	6.99 J	1.66 U	1.63 UJ	10.80 J	0.32 -	19.90 -
A1P2-S3SA-01-07-RM-D	1.25 -	1.09 -	1.10 -	1.09 -	13.18 J	1.61 U	1.61 UJ	13.10 J	0.62 -	22.50 -
A1P2-S3SA-01-08-RM	1.11 -	0.86 -	0.86 -	0.86 -	14.78 -	1.46 U	4.12 UJ	8.76 J	0.62 -	16.40 -
A1P2-S3SA-01-09-RM	1.26 -	1.02 -	0.98 -	1.02 -	15.34 -	1.53 U	2.91 UJ	12.10 J	0.68 -	22.70 -
A1P2-S3SA-01-11-RM	1.21 -	1.02 -	0.98 -	1.02 -	6.58 -	1.38 U	2.82 UJ	7.90 J	0.67 -	21.60 -
A1P2-S3SA-01-12-RM	1.40 -	0.99 -	0.96 -	0.99 -	17.24 -	1.39 U	2.15 UJ	6.60 J	0.55 -	19.10 -
A1P2-S3SA-01-13-RM	1.47 -	1.18 -	1.14 -	1.18 -	2.79 U	1.54 U	1.94 UJ	9.65 J	0.87 -	27.60 -
A1P2-S3SA-01-14-RM	0.99 -	0.78 -	0.75 -	0.78 -	2.85 U	1.36 U	3.08 UJ	9.88 J	0.53 -	13.90 -
A1P2-S3SA-01-16-RM	1.31 -	1.03 -	1.04 -	1.03 -	6.90 -	1.27 U	2.37 UJ	7.58 J	0.68 -	19.80 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%
Max Result	1.47 @	1.18 @	1.14 @	1.18 @	17.24 @	1.66 U @	4.12 U @	13.10	0.87 @	27.60 @
Standardized Skewness	--	--	--	--	--	--	--	0.457	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	63.8% (LN)	--	--
Test Procedure	--	--	--	--	--	--	--	t-Test (LN)	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--	9.35	--	--
UCL on the Mean**	--	--	--	--	--	--	--	10.24	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	Pass	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	4	--	--
Size calculation	--	--	--	--	--	--	--	Pass	--	--

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
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"UNV" = not detected, not validated

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3SA-02

	PRIMARY COCs					SECONDARY COCs					
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead	Molybdenum
A1P2-S3SA-02-01-RM	1.10 -	1.00 -	0.97 -	1.00 -	7.19 -	1.08 U	1.06 UJ	6.53 -	0.10 -	17.70 -	0.44 U
A1P2-S3SA-02-02-RM	1.08 -	0.90 -	0.90 -	0.90 -	10.62 -	1.12 U	1.52 J	5.43 -	0.03 U	16.50 -	1.65 U
A1P2-S3SA-02-04-RM	1.08 -	0.79 -	0.77 -	0.79 -	6.69 -	1.11 U	1.00 UJ	4.05 -	0.12 -	20.50 -	1.09 U
A1P2-S3SA-02-05-RM	1.23 -	1.02 -	1.00 -	1.02 -	10.92 -	1.45 U	1.02 UJ	4.07 -	0.03 U	19.10 -	0.42 U
A1P2-S3SA-02-06-RM	1.05 -	0.85 -	0.83 -	0.85 -	4.85 J	1.45 U	1.62 J	8.20 -	0.03 U	16.40 -	0.86 U
A1P2-S3SA-02-08-RM	1.09 -	1.01 -	0.96 -	1.01 -	25.19 -	1.43 U	1.02 UJ	6.47 -	0.03 U	22.50 -	0.43 U
A1P2-S3SA-02-09-RM	1.24 -	0.95 -	0.93 -	0.95 -	7.47 -	1.33 U	1.05 UJ	4.63 -	0.03 U	18.50 -	0.44 U
A1P2-S3SA-02-11-RM	1.53 -	0.82 -	0.82 -	0.82 -	6.07 -	1.17 U	1.69 J	2.01 -	0.03 U	19.70 -	0.41 U
A1P2-S3SA-02-12-RM	1.17 -	0.75 -	0.74 -	0.75 -	5.60 -	1.29 U	0.92 UJ	4.84 -	0.24 -	32.40 -	0.38 U
A1P2-S3SA-02-13-RM	1.10 -	0.92 -	0.88 -	0.92 -	16.54 -	1.40 U	1.16 J	7.08 -	0.06 -	23.10 -	0.41 U
A1P2-S3SA-02-15-RM	0.91 -	1.00 -	0.98 -	1.00 -	10.74 -	1.52 U	1.23 J	7.43 -	0.07 -	17.80 -	0.42 U
A1P2-S3SA-02-16-RM	1.26 J	1.00 -	0.97 -	1.00 -	6.57 -	1.40 U	1.08 UJ	7.74 J	0.08 -	19.50 -	0.53 U
A1P2-S3SA-02-16-RM-D	1.04 J	0.98 -	0.94 -	0.98 -	7.72 -	1.46 U	0.99 UJ	3.89 J	0.03 U	17.40 -	0.41 U
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00	130.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%
Max Result	1.53 @	1.02 @	1.00 @	1.02 @	25.19 @	1.52 U @	1.69 @	8.20 @	0.24 @	32.40 @	1.65 U @
Standardized Skewness	--	--	--	--	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" " = no data qualifier
"UNV" = not validated
"UNV" = not detected, not validated

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3SA-03

	PRIMARY COCs					SECONDARY COCs				
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead
A1P2-S3SA-03-01-RM	1.16 -	1.10 -	1.11 -	1.10 -	10.43 -	1.24 U	1.73 U	7.54 -	0.21 -	22.40 -
A1P2-S3SA-03-03-RM	1.23 -	1.00 -	0.99 -	1.00 -	7.28 -	1.19 U	1.48 U	7.32 -	0.50 -	18.30 -
A1P2-S3SA-03-04-RM	1.12 -	1.06 -	1.06 -	1.06 -	15.94 -	1.33 U	1.02 UJ	5.84 -	0.44 -	22.50 -
A1P2-S3SA-03-06-RM	1.00 -	1.06 -	1.02 -	1.06 -	10.75 -	1.66 U	1.02 UJ	6.44 -	0.23 -	21.90 -
A1P2-S3SA-03-07-RM	1.14 -	0.90 -	0.90 -	0.90 -	10.45 J	1.36 U	1.57 U	7.40 -	0.20 -	20.60 -
A1P2-S3SA-03-08-RM	1.19 -	1.10 -	1.08 -	1.10 -	5.73 -	1.33 U	1.04 UJ	7.62 -	0.18 -	20.60 -
A1P2-S3SA-03-10-RM	1.20 -	1.04 -	1.04 -	1.04 -	13.70 -	1.16 U	1.01 UJ	7.00 -	0.03 U	18.20 -
A1P2-S3SA-03-11-RM	1.20 -	1.06 -	1.05 -	1.06 -	6.65 -	1.27 U	1.50 U	8.60 -	0.08 -	20.70 -
A1P2-S3SA-03-12-RM	1.43 -	1.11 -	1.08 -	1.11 -	27.07 J	1.40 U	2.48 U	10.10 -	0.96 -	24.40 -
A1P2-S3SA-03-12-RM-D	1.40 -	1.21 -	1.20 -	1.21 -	10.59 J	1.46 U	1.71 U	7.79 -	0.80 -	23.40 -
A1P2-S3SA-03-14-RM	1.56 -	1.11 -	1.10 -	1.11 -	18.23 -	1.24 U	1.96 U	6.84 -	0.97 -	24.90 -
A1P2-S3SA-03-15-RM	1.31 -	2.69 -	2.79 -	2.87 -	29.53 -	26.70 -	4.03 U	8.40 -	0.46 -	23.50 -
A1P2-S3SA-03-16-RM	1.42 -	1.54 -	1.50 -	1.54 -	41.82 -	3.27 -	2.65 U	3.66 U	0.44 -	23.90 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%
Max Result	1.56 @	2.69	2.79	2.87	41.82 @	26.70 @	4.03 U @	10.10 @	0.97 @	24.90 @
Standardized Skewness	--	4.105	4.260	4.235	--	--	--	--	--	--
W-Statistic Probability*	--	< 1% (LN)	< 1% (LN)	< 1% (LN)	--	--	--	--	--	--
Test Procedure	--	Median	Median	Median	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12
Estimated Mean	--	1.08	1.07	1.08	--	--	--	--	--	--
UCL on the Mean**	--	1.21	1.20	1.21	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	Pass	Pass	Pass	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	7	7	12	--	--	--	--	--	--
Size calculation	--	Pass	Pass	Pass	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

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Appendix A: Certification Statistics for A1P2-S3SA-04

Sample ID	PRIMARY COCs					SECONDARY COCs					
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead	Molybdenum
A1P2-S3SA-04-01-RM	0.71 -	0.55 -	0.56 -	0.55 -	2.84 U	1.32 U	4.36 U	8.38 -	0.33 U	13.50 -	0.76 U
A1P2-S3SA-04-02-RM	0.92 -	0.80 -	0.78 -	0.80 -	8.65 -	1.42 U	5.00 U	7.76 -	0.15 U	13.00 -	0.76 U
A1P2-S3SA-04-03-RM	1.29 -	1.10 -	1.05 -	1.10 -	7.08 -	1.21 U	3.50 U	8.26 -	0.27 U	16.10 -	0.87 U
A1P2-S3SA-04-05-RM	1.35 -	1.13 -	1.08 -	1.13 -	11.30 -	0.27 J	1.89 U	7.56 -	0.21 U	16.00 -	0.19 U
A1P2-S3SA-04-06-RM	1.30 -	1.01 -	1.01 -	1.01 -	10.05 -	1.42 U	3.69 U	6.00 -	0.23 U	17.70 -	0.54 U
A1P2-S3SA-04-07-RM	1.13 -	1.00 -	0.97 -	1.00 -	33.98 -	1.25 U	1.93 U	8.60 -	0.35 U	20.00 -	0.45 U
A1P2-S3SA-04-09-RM	1.27 -	1.10 -	1.06 -	1.10 -	27.44 -	1.42 U	2.32 U	11.10 J	0.34 U	23.60 -	0.53 U
A1P2-S3SA-04-09-RM-D	1.20 -	0.97 -	0.96 -	0.97 -	26.66 -	1.41 U	2.91 U	6.20 J	0.24 U	17.90 -	0.35 U
A1P2-S3SA-04-11-RM	1.59 -	1.37 -	1.35 -	1.37 -	73.71 -	6.23 J	2.39 U	0.48 U	0.72 U	20.10 -	0.48 U
A1P2-S3SA-04-12-RM	1.54 -	1.39 -	1.35 -	1.39 -	62.25 -	9.29 -	3.01 U	6.60 -	0.51 U	26.50 -	0.48 U
A1P2-S3SA-04-13-RM	1.37 -	1.19 -	1.20 -	1.19 -	19.11 -	1.28 U	1.58 U	6.70 -	0.57 U	18.00 -	0.44 U
A1P2-S3SA-04-14-RM	1.27 -	1.14 -	1.10 -	1.14 -	24.78 -	1.51 U	1.18 U	7.60 -	0.26 U	23.10 -	0.26 U
A1P2-S3SA-04-15-RM	1.26 -	1.09 -	1.06 -	1.09 -	3.71 J	1.38 U	1.57 U	7.76 -	0.11 U	17.40 -	0.43 U
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00	130.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%
Max Result	1.59 @	1.39 @	1.35 @	1.39 @	73.71 @	9.29 @	5.00 U @	11.10 @	0.72 U @	26.50 @	0.87 U @
Standardized Skewness	--	--	--	--	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

000138

Appendix A: Certification Statistics for A1P2-S3SA-05

Sample ID	PRIMARY COCs					SECONDARY COCs				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead
A1P2-S3SA-05-02-RM	1.47 -	1.19 -	1.16 -	1.19 -	10.10 -	1.41 U	2.10 J	7.52 J	0.79 -	25.00 -
A1P2-S3SA-05-03-RM	1.40 -	1.15 -	1.13 -	1.15 -	8.87 -	1.28 U	1.65 J	7.96 J	0.04 U	25.80 -
A1P2-S3SA-05-04-RM	1.45 -	1.18 -	1.17 -	1.18 -	6.70 -	1.03 U	1.41 U	5.80 J	0.52 -	25.30 -
A1P2-S3SA-05-04-RM-D	1.39 -	1.18 -	1.16 -	1.18 -	4.85 -	1.44 U	1.69 J	5.74 J	0.31 -	18.30 -
A1P2-S3SA-05-05-RM	1.18 -	1.12 -	1.09 -	1.12 -	5.04 -	1.25 U	2.50 J	7.26 J	0.04 U	34.40 -
A1P2-S3SA-05-07-RM	1.31 -	1.00 -	0.98 -	1.00 -	4.39 -	1.62 U	2.09 J	8.22 J	0.37 -	22.00 -
A1P2-S3SA-05-08-RM	1.27 -	1.19 -	1.20 -	1.19 -	17.54 -	1.47 U	2.04 J	6.29 J	0.19 U	25.80 -
A1P2-S3SA-05-09-RM	1.23 -	1.13 -	1.14 -	1.13 -	15.60 -	1.31 U	2.13 J	6.80 J	0.04 U	24.70 -
A1P2-S3SA-05-11-RM	1.16 -	1.12 -	1.11 -	1.12 -	4.07 J	1.21 U	1.66 J	6.07 J	0.03 U	23.80 -
A1P2-S3SA-05-12-RM	1.44 -	1.24 -	1.19 -	1.24 -	11.55 -	1.61 U	1.65 J	7.46 J	0.05 U	22.90 -
A1P2-S3SA-05-13-RM	1.20 -	1.07 -	1.09 -	1.07 -	6.58 -	1.11 U	2.11 J	6.83 J	0.03 U	24.20 -
A1P2-S3SA-05-14-RM	1.36 -	1.19 -	1.20 -	1.19 -	6.72 -	1.41 U	1.57 U	9.06 J	0.04 U	24.40 -
A1P2-S3SA-05-16-RM	1.28 -	1.20 -	1.16 -	1.20 -	3.19 U	1.35 U	1.96 J	8.34 J	0.04 U	26.80 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%
Max Result	1.47 @	1.24 @	1.20 @	1.24 @	17.54 @	1.62 U @	2.50 @	9.06 @	0.79 @	34.40 @
Standardized Skewness	--	--	--	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

0001139

Appendix A: Certification Statistics for A1P2-S3SA-06

Sample ID	PRIMARY COCs					SECONDARY COCs				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead
A1P2-S3SA-06-01-RM	1.39 -	1.17 -	1.14 -	1.17 -	10.82 -	1.31 U	1.59 U	7.67 -	0.57 -	28.40 -
A1P2-S3SA-06-01-RM-D	1.37 -	1.15 -	1.14 -	1.15 -	12.11 -	1.16 U	3.10 U	9.08 -	0.51 -	27.60 -
A1P2-S3SA-06-03-RM	1.31 -	1.07 -	1.05 -	1.07 -	14.47 -	1.66 U	2.45 U	4.76 -	0.21 -	27.50 -
A1P2-S3SA-06-04-RM	1.29 -	1.16 -	1.14 -	1.16 -	3.20 U	1.62 U	1.98 U	6.39 -	0.33 -	28.00 -
A1P2-S3SA-06-05-RM	1.11 -	1.00 -	0.99 -	1.00 -	9.71 -	1.56 U	2.96 U	8.50 -	0.39 -	24.20 -
A1P2-S3SA-06-07-RM	1.25 -	1.13 -	1.12 -	1.13 -	8.23 -	1.30 U	1.90 U	6.62 -	0.68 -	29.00 -
A1P2-S3SA-06-08-RM	1.41 -	1.24 -	1.22 -	1.24 -	5.32 -	1.49 U	1.50 U	5.17 -	0.34 -	27.10 -
A1P2-S3SA-06-09-RM	1.43 -	1.10 -	1.13 -	1.10 -	4.40 J	1.41 U	2.75 U	7.27 -	0.32 -	26.10 -
A1P2-S3SA-06-10-RM	1.33 -	1.15 -	1.14 -	1.15 -	5.87 -	1.25 U	2.67 U	9.21 -	0.61 -	34.10 -
A1P2-S3SA-06-11-RM	1.43 -	1.20 -	1.16 -	1.20 -	8.84 -	1.39 U	1.81 U	6.28 -	0.79 -	29.00 -
A1P2-S3SA-06-14-RM	1.26 -	1.09 -	1.06 -	1.09 -	10.03 -	1.70 U	1.48 U	5.30 -	0.28 -	24.90 -
A1P2-S3SA-06-15-RM	1.21 -	1.06 -	1.03 -	1.06 -	8.12 -	0.79 U	3.06 U	9.81 -	0.28 -	25.60 -
A1P2-S3SA-06-16-RM	1.40 -	1.18 -	1.20 -	1.18 -	5.61 -	1.49 U	2.13 U	7.94 -	0.49 -	29.50 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%
Max Result	1.43 @	1.24 @	1.22 @	1.24 @	14.47 @	1.70 U @	3.10 U @	9.81 @	0.79 @	34.10 @
Standardized Skewness	--	--	--	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--	--	--	--

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Definition of Qualifiers
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"UJ" = not detected, estimated
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"UNV" = not detected, not validated

Appendix A: Certification Statistics for A1P2-S3SA-07

Sample ID	PRIMARY COCs					SECONDARY COCs				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead
A1P2-S3SA-07-01-RM	1.22 -	1.13 -	1.09 -	1.13 -	7.11 -	1.50 U	1.06 UJ	2.97 U	1.29 J	19.30 -
A1P2-S3SA-07-02-RM	0.95 -	1.05 -	1.05 -	1.05 -	6.81 -	1.43 U	1.07 UJ	2.92 U	0.05 U	23.10 -
A1P2-S3SA-07-04-RM	1.05 -	1.03 -	0.99 -	1.03 -	8.20 -	1.57 U	0.92 UJ	5.43 -	0.23 U	26.30 -
A1P2-S3SA-07-05-RM	1.11 -	1.12 -	1.11 -	1.12 -	33.97 -	1.30 U	1.01 UJ	5.19 -	0.22 U	23.20 -
A1P2-S3SA-07-07-RM	1.13 -	1.08 -	1.05 -	1.08 -	8.51 -	1.48 U	1.02 UJ	5.79 -	0.28 U	17.90 -
A1P2-S3SA-07-08-RM	1.33 -	1.12 -	1.12 -	1.12 -	8.03 -	1.51 U	0.97 UJ	2.91 -	0.32 U	20.00 -
A1P2-S3SA-07-09-RM	1.10 -	1.08 -	1.07 -	1.08 -	4.63 -	1.30 U	1.32 J	7.35 -	0.12 U	20.30 -
A1P2-S3SA-07-09-RM-D	1.19 -	1.19 -	1.17 -	1.19 -	3.87 J	1.56 U	1.09 UJ	6.87 -	0.15 U	22.30 -
A1P2-S3SA-07-11-RM	1.04 -	1.04 -	1.02 -	1.04 -	9.13 -	1.58 U	1.40 J	2.67 U	0.19 U	18.00 -
A1P2-S3SA-07-12-RM	1.02 -	1.13 -	1.14 -	1.13 -	6.30 J	1.63 U	1.05 UJ	2.76 U	0.27 U	16.60 -
A1P2-S3SA-07-13-RM	1.35 -	1.19 -	1.18 -	1.19 -	5.72 -	1.48 U	1.04 UJ	6.34 -	0.24 U	17.60 -
A1P2-S3SA-07-14-RM	1.37 -	1.12 -	1.11 -	1.12 -	12.77 -	1.50 U	1.03 UJ	3.11 -	0.47 U	25.80 -
A1P2-S3SA-07-16-RM	1.33 -	1.19 -	1.12 -	1.19 -	58.82 -	1.55 J	1.80 J	2.81 U	0.11 U	21.40 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%
Max Result	1.37 @	1.19 @	1.18 @	1.19 @	58.82 @	1.55 @	1.80 @	7.35 @	1.29 @	26.30 @
Standardized Skewness	--	--	--	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
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"U" = not detected
" - " = no data qualifier
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NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3SA-08

Sample ID	PRIMARY COCs					SECONDARY COCs					
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead	Molybdenum
A1P2-S3SA-08-01-RM	1.40 -	1.20 -	1.16 -	1.20 -	13.14 -	1.22 U	1.06 U	6.01 J	0.51 -	25.40 -	1.26 U
A1P2-S3SA-08-02-RM	1.33 -	1.09 -	1.09 -	1.09 -	7.44 -	1.23 U	1.00 U	5.70 J	0.45 -	21.90 -	0.57 U
A1P2-S3SA-08-04-RM	1.26 -	1.24 -	1.21 -	1.24 -	46.52 -	1.27 U	1.11 U	5.48 J	0.41 -	19.10 -	0.55 U
A1P2-S3SA-08-05-RM	1.36 -	1.22 -	1.18 -	1.22 -	10.07 -	1.18 U	3.00 J	3.05 J	0.18 -	13.90 -	0.45 U
A1P2-S3SA-08-06-RM	1.42 -	1.17 -	1.11 -	1.17 -	21.15 -	1.55 U	1.01 U	4.63 J	0.33 -	18.60 -	0.49 U
A1P2-S3SA-08-07-RM	1.43 -	1.13 -	1.09 -	1.13 -	5.34 -	1.21 U	1.08 U	2.35 J	0.25 -	17.00 -	0.45 U
A1P2-S3SA-08-09-RM	1.27 -	1.08 -	1.06 -	1.08 -	5.34 -	1.38 J	1.18 J	7.54 J	0.42 -	17.20 -	0.91 U
A1P2-S3SA-08-10-RM	1.45 -	0.98 -	0.96 -	0.98 -	16.24 -	2.51 -	2.11 J	3.83 J	0.24 -	14.30 -	14.30 -
A1P2-S3SA-08-11-RM	1.30 -	1.11 -	1.11 -	1.11 -	47.69 J	1.26 J	2.17 J	3.57 J	0.17 -	17.70 -	0.43 U
A1P2-S3SA-08-11-RM-D	1.18 -	1.20 -	1.17 -	1.20 -	72.60 J	1.38 U	1.43 J	4.97 J	0.16 -	21.00 -	0.45 U
A1P2-S3SA-08-14-RM	2.18 -	1.22 -	1.18 -	1.22 -	52.88 -	1.37 J	1.13 U	4.47 J	0.28 -	29.60 -	0.50 U
A1P2-S3SA-08-15-RM	1.51 -	1.07 -	1.06 -	1.07 -	27.49 -	1.30 U	1.01 U	5.42 J	0.38 -	20.30 -	0.56 U
A1P2-S3SA-08-16-RM	1.47 -	1.26 -	1.24 -	1.26 -	14.69 -	1.93 U	1.03 U	8.47 J	0.54 -	22.10 -	0.43 U
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00	130.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%
Max Result	2.18	1.26 @	1.24 @	1.26 @	72.60 @	2.51 @	3.00 @	8.47 @	0.54 @	29.60 @	14.30 @
Standardized Skewness	3.997	--	--	--	--	--	--	--	--	--	--
W-Statistic Probability*	< 1% (LN)	--	--	--	--	--	--	--	--	--	--
Test Procedure	Median	--	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12	12	12
Estimated Mean	1.41	--	--	--	--	--	--	--	--	--	--
UCL on the Mean**	1.47	--	--	--	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	Pass	--	--	--	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	7	--	--	--	--	--	--	--	--	--	--
Size calculation	Pass	--	--	--	--	--	--	--	--	--	--

Definition of Qualifiers
" " = estimated result
"UJ" = not detected, estimated
"U" = not detected
" " = no data qualifier
"UNV" = not validated
"UNV" = not detected, not validated

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3SA-09

Sample ID	PRIMARY COCs					SECONDARY COCs					
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead	Molybdenum
A1P2-S3SA-09-01-RM	0.80 -	0.55 -	0.51 -	0.55 -	3.92 -	1.23 U	1.47 UJ	4.49 -	0.13 J	11.20 -	1.15 -
A1P2-S3SA-09-02-RM	0.85 -	0.66 -	0.66 -	0.66 -	3.51 J	1.23 U	2.11 UJ	6.12 -	0.14 J	11.50 -	0.40 -
A1P2-S3SA-09-03-RM	1.34 -	1.14 -	1.13 -	1.14 -	4.24 J	1.20 U	1.05 U	8.47 -	0.11 J	19.20 -	0.44 U
A1P2-S3SA-09-04-RM	1.42 -	1.22 -	1.20 -	1.22 -	3.33 J	1.31 U	1.01 U	5.82 -	0.60 J	17.60 -	0.42 U
A1P2-S3SA-09-05-RM	0.89 -	0.72 -	0.70 -	0.72 -	8.02 UJ	1.21 U	1.02 U	3.72 -	0.22 J	14.10 -	0.43 U
A1P2-S3SA-09-06-RM	1.70 -	1.17 -	1.15 -	1.17 -	3.26 U	1.25 U	1.12 U	4.39 -	0.62 J	12.60 -	0.47 U
A1P2-S3SA-09-07-RM	1.34 -	1.16 -	1.14 -	1.16 -	5.99 -	1.21 U	1.06 U	6.43 -	0.50 J	12.10 -	0.44 U
A1P2-S3SA-09-08-RM	1.41 -	1.09 -	1.10 -	1.09 -	4.80 -	1.20 U	1.04 U	9.09 J	0.16 J	20.60 -	0.43 U
A1P2-S3SA-09-08-RM-D	1.28 -	1.12 -	1.11 -	1.12 -	6.45 -	1.07 U	1.03 U	3.34 J	0.18 J	16.60 -	0.46 -
A1P2-S3SA-09-09-RM	1.23 -	1.06 -	1.01 -	1.06 -	3.68 J	1.27 U	1.39 U	7.08 -	0.79 J	26.70 -	0.58 U
A1P2-S3SA-09-10-RM	1.48 -	1.12 -	1.08 -	1.12 -	17.53 -	1.45 U	1.09 U	5.34 -	0.87 J	15.80 -	0.82 -
A1P2-S3SA-09-11-RM	1.27 -	0.90 -	0.88 -	0.90 -	10.80 -	1.41 U	1.44 UJ	3.23 U	0.38 J	15.80 -	0.91 -
A1P2-S3SA-09-12-RM	1.45 -	1.19 -	1.16 -	1.19 -	7.95 -	1.37 U	1.09 U	8.82 -	0.54 J	21.70 -	0.45 U
A1P2-S3SA-09-13-RM	1.53 -	1.23 -	1.20 -	1.23 -	5.95 -	1.38 U	1.02 U	8.83 -	0.60 J	17.20 -	0.56 -
A1P2-S3SA-09-14-RM	1.43 -	1.13 -	1.11 -	1.13 -	10.28 -	1.39 U	1.20 UJ	6.66 -	0.47 J	13.60 -	0.43 U
A1P2-S3SA-09-15-RM	1.26 -	1.20 -	1.19 -	1.20 -	6.14 -	1.40 U	0.99 UJ	3.04 U	0.20 J	9.50 -	0.50 -
A1P2-S3SA-09-16-RM	1.32 -	0.99 -	0.96 -	0.99 -	4.26 -	1.40 U	2.19 UJ	5.26 -	0.13 J	16.80 -	0.44 U
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00	130.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%
Max Result	1.70 @	1.23 @	1.20 @	1.23 @	17.53 @	1.45 U @	2.19 UJ @	9.09 @	0.87 @	26.70 @	1.15 @
Standardized Skewness	--	--	--	--	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--	--
Sample Size	16	16	16	16	16	16	16	16	16	16	16
Estimated Mean	--	--	--	--	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3SA-09B

Sample ID	PRIMARY COCs					SECONDARY COCs					
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead	Molybdenum
A1P2-S3SA-09-01B-RM	0.95 -	0.70 -	0.68 -	0.70 -	2.91 U	1.32 U	1.29 UJ	3.13 U	0.17 J	12.20 -	0.67 -
A1P2-S3SA-09-02B-RM	0.92 -	0.81 -	0.80 -	0.81 -	2.42 J	1.29 U	1.34 UJ	6.54 -	0.26 J	14.50 -	0.42 U
A1P2-S3SA-09-03B-RM	1.38 -	1.12 -	1.11 -	1.12 -	4.57 -	1.28 U	1.06 U	5.43 -	0.07 J	15.30 -	0.44 U
A1P2-S3SA-09-04B-RM	1.50 -	1.21 -	1.18 -	1.21 -	2.85 U	1.43 U	1.02 U	6.79 -	0.75 J	18.60 -	0.43 U
A1P2-S3SA-09-05B-RM	0.81 -	0.66 -	0.63 -	0.66 -	2.64 U	1.18 U	3.14 UJ	3.21 -	0.30 J	10.40 -	0.71 -
A1P2-S3SA-09-06B-RM	1.52 -	1.05 -	1.01 -	1.05 -	3.04 J	1.29 U	1.04 U	6.84 -	0.56 J	10.40 -	0.43 U
A1P2-S3SA-09-07B-RM	1.51 -	1.15 -	1.09 -	1.15 -	5.18 -	1.18 U	1.02 U	11.60 -	0.75 J	18.60 -	0.43 U
A1P2-S3SA-09-08B-RM	1.47 -	1.19 -	1.16 -	1.19 -	3.69 J	1.40 U	1.02 U	4.97 J	0.71 J	14.60 -	0.42 U
A1P2-S3SA-09-08B-RM-D	1.58 -	1.19 -	1.17 -	1.19 -	2.59 U	1.22 U	1.09 U	3.40 UJ	0.40 J	9.55 -	0.45 U
A1P2-S3SA-09-09B-RM	0.89 -	0.85 -	0.81 -	0.85 -	2.93 U	1.33 U	1.04 UJ	5.06 -	0.47 J	15.40 -	0.42 U
A1P2-S3SA-09-10B-RM	1.49 -	1.18 -	1.15 -	1.18 -	7.28 -	1.38 U	1.04 U	12.50 -	0.44 J	26.20 -	1.26 -
A1P2-S3SA-09-11B-RM	1.29 -	0.93 -	0.93 -	0.93 -	4.56 -	1.39 U	1.02 U	3.17 U	0.46 J	12.20 -	0.42 U
A1P2-S3SA-09-12B-RM	1.44 -	1.14 -	1.15 -	1.14 -	3.68 U	1.40 U	1.12 U	4.54 -	0.56 J	17.30 -	0.46 U
A1P2-S3SA-09-13B-RM	1.49 -	1.26 -	1.25 -	1.26 -	4.03 J	1.39 U	1.08 U	9.79 -	0.41 J	20.60 -	0.75 -
A1P2-S3SA-09-14B-RM	1.25 -	1.10 -	1.11 -	1.10 -	3.68 J	1.35 U	1.06 U	4.11 -	0.57 J	16.40 -	0.44 U
A1P2-S3SA-09-15B-RM	1.30 -	1.16 -	1.15 -	1.16 -	3.91 J	1.46 U	1.09 U	10.20 -	0.78 J	18.90 -	0.80 -
A1P2-S3SA-09-16B-RM	1.43 -	1.14 -	1.11 -	1.14 -	2.83 J	1.22 U	1.12 UJ	9.97 -	0.54 J	19.20 -	0.98 -
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00	130.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%
Max Result	1.58 @	1.26 @	1.25 @	1.26 @	7.28 @	1.46 U @	3.14 UJ @	12.50	0.78 @	26.20 @	1.26 @
Standardized Skewness	--	--	--	--	--	--	--	0.358	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	36.0% (N)	--	--	--
Test Procedure	--	--	--	--	--	--	--	t-Test (N)	--	--	--
Sample Size	16	16	16	16	16	16	16	16	16	16	16
Estimated Mean	--	--	--	--	--	--	--	6.54	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	7.68	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	Pass	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	3	--	--	--
Size calculation	--	--	--	--	--	--	--	Pass	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

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Appendix A: Certification Statistics for A1P2-S3SA-10

Sample ID	PRIMARY COCs					SECONDARY COCs	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S3SA-10-01-RM	1.34 J	1.22 J	1.24 -	1.21 -	30.61 -	7.60 -	19.80 -
A1P2-S3SA-10-03-RM	1.42 J	1.17 J	1.19 -	1.16 -	12.62 -	9.00 -	22.80 -
A1P2-S3SA-10-04-RM	1.37 J	1.16 J	1.16 -	1.14 -	6.67 -	6.50 -	16.70 -
A1P2-S3SA-10-05-RM	1.55 J	1.33 J	1.37 -	1.32 -	6.06 -	8.10 -	19.70 -
A1P2-S3SA-10-07-RM	1.47 J	1.31 J	1.34 -	1.29 -	6.01 -	8.80 -	18.20 -
A1P2-S3SA-10-08-RM	1.15 J	1.23 J	1.24 -	1.22 -	6.87 -	9.10 -	20.10 -
A1P2-S3SA-10-09-RM	1.46 J	1.20 J	1.24 -	1.18 -	5.93 -	9.30 -	16.90 -
A1P2-S3SA-10-10-RM	1.35 J	1.19 J	1.21 -	1.18 -	10.97 -	8.40 -	16.30 -
A1P2-S3SA-10-11-RM	1.33 J	1.18 J	1.19 -	1.17 -	5.86 J	6.80 -	15.80 -
A1P2-S3SA-10-11-RM-D	1.13 J	1.19 J	1.19 -	1.18 -	8.65 J	7.70 -	18.10 -
A1P2-S3SA-10-13-RM	1.53 J	1.27 J	1.37 -	1.26 -	5.47 -	6.70 -	13.00 -
A1P2-S3SA-10-14-RM	1.50 J	1.32 J	1.34 -	1.30 -	4.59 -	10.50 -	25.60 -
A1P2-S3SA-10-15-RM	1.47 J	1.23 J	1.25 -	1.21 -	3.00 -	10.60 -	16.50 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.55 @	1.33 @	1.37 @	1.32 @	30.61 @	10.60 @	25.60 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample Size calculation	--	--	--	--	--	--	--

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

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3SA-11

Sample ID	PRIMARY COCs					SECONDARY COCs					
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead	Molybdenum
A1P2-S3SA-11-01-RM	0.93 -	0.74 -	0.71 -	0.74 -	3.18 J	1.34 U	1.19 -	8.64 J	0.12 -	15.40 -	1.26 U
A1P2-S3SA-11-02-RM	0.90 -	0.77 -	0.77 -	0.77 -	5.70 -	1.22 U	1.75 -	2.89 UJ	0.07 -	10.30 -	0.88 U
A1P2-S3SA-11-03-RM	1.41 -	1.15 -	1.14 -	1.15 -	11.40 -	1.31 U	0.99 U	10.80 J	0.53 -	20.30 -	0.62 U
A1P2-S3SA-11-04-RM	0.85 -	0.74 -	0.73 -	0.74 -	2.42 J	1.18 U	1.58 -	3.48 J	0.11 -	14.50 -	0.70 U
A1P2-S3SA-11-05-RM	1.42 -	1.15 -	1.13 -	1.15 -	25.45 -	1.25 U	1.06 U	7.04 J	0.33 -	17.00 -	0.44 U
A1P2-S3SA-11-06-RM	1.40 -	1.17 -	1.16 -	1.17 -	6.60 -	1.19 U	1.05 U	6.09 J	0.66 -	20.80 -	0.44 U
A1P2-S3SA-11-07-RM	0.71 -	0.67 -	0.64 -	0.67 -	3.62 J	1.14 U	1.40 -	3.33 J	0.11 -	9.96 -	0.61 U
A1P2-S3SA-11-08-RM	1.04 -	0.89 -	0.88 -	0.89 -	7.27 -	1.25 U	1.04 U	7.22 J	0.03 U	15.20 -	0.51 U
A1P2-S3SA-11-09-RM	1.17 -	0.90 -	0.88 -	0.90 -	37.71 -	1.96 J	2.35 -	8.97 J	0.24 -	19.00 -	0.43 U
A1P2-S3SA-11-10-RM	1.52 -	1.21 -	1.21 -	1.21 -	25.41 -	1.34 U	1.05 U	6.96 J	0.65 -	18.00 -	0.60 U
A1P2-S3SA-11-11-RM	1.32 -	1.03 -	0.98 -	1.03 -	38.17 -	2.63 -	2.14 -	5.77 J	0.39 -	19.60 -	0.45 U
A1P2-S3SA-11-12-RM	1.48 -	1.19 J	1.16 J	1.19 J	22.36 J	1.36 U	1.54 -	5.25 J	0.32 -	19.30 -	0.46 U
A1P2-S3SA-11-12-RM-D	1.46 -	1.21 J	1.20 J	1.21 J	18.30 J	1.37 U	1.76 -	6.56 J	0.40 -	18.90 -	0.44 U
A1P2-S3SA-11-13-RM	1.41 -	1.16 -	1.15 -	1.16 -	8.03 -	1.27 U	1.07 U	5.28 J	0.61 -	18.80 -	0.45 U
A1P2-S3SA-11-14-RM	0.90 -	0.77 -	0.74 -	0.77 -	2.44 U	1.37 U	0.94 U	3.55 J	0.21 -	14.80 -	0.57 U
A1P2-S3SA-11-15-RM	1.42 -	1.27 -	1.23 -	1.27 -	3.32 J	1.26 U	1.12 U	7.45 J	0.76 -	23.90 -	0.50 U
A1P2-S3SA-11-16-RM	1.11 -	0.86 -	0.84 -	0.86 -	3.06 J	1.21 U	0.97 U	7.94 J	0.41 -	16.90 -	0.94 U
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00	130.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%
Max Result	1.52 @	1.27 @	1.23 @	1.27 @	38.17 @	2.63 @	2.35 @	10.80 @	0.76 @	23.90 @	1.26 U @
Standardized Skewness	--	--	--	--	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--	--
Sample Size	16	16	16	16	16	16	16	16	16	16	16
Estimated Mean	--	--	--	--	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
"U.." = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not validated

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A1P2-S3SA-11B

Sample ID	PRIMARY COCs					SECONDARY COCs					
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Arsenic	Beryllium	Lead	Molybdenum
A1P2-S3SA-11-01B-RM	1.11 -	0.91 -	0.90 -	0.91 -	5.30 -	1.24 U	1.03 U	3.83 J	0.23 -	16.40 -	2.81 U
A1P2-S3SA-11-02B-RM	0.87 -	0.71 -	0.67 -	0.71 -	3.06 U	1.20 U	2.46 -	4.50 J	0.20 -	14.60 -	1.08 U
A1P2-S3SA-11-03B-RM	1.57 -	1.23 -	1.19 -	1.23 -	5.45 -	1.25 U	1.03 U	5.27 J	0.68 -	13.80 -	0.51 U
A1P2-S3SA-11-04B-RM	0.81 -	0.69 -	0.67 -	0.69 -	2.74 J	1.24 U	0.94 U	4.32 J	0.13 -	12.30 -	1.86 U
A1P2-S3SA-11-05B-RM	1.54 -	1.28 -	1.28 -	1.28 -	3.08 J	1.25 U	2.60 -	10.30 J	0.46 -	21.70 -	0.93 U
A1P2-S3SA-11-06B-RM	1.44 -	1.17 -	1.14 -	1.17 -	3.29 J	1.39 U	1.03 U	9.40 J	0.45 -	18.70 -	0.43 U
A1P2-S3SA-11-07B-RM	0.88 -	0.66 -	0.64 -	0.66 -	2.88 U	1.29 U	1.76 -	3.03 UJ	0.09 -	11.40 -	1.19 U
A1P2-S3SA-11-08B-RM	0.96 -	0.80 -	0.79 -	0.80 -	3.21 J	1.28 U	2.19 -	11.40 J	0.03 U	12.40 -	0.89 U
A1P2-S3SA-11-09B-RM	1.37 -	1.16 -	1.12 -	1.16 -	13.93 -	1.39 U	1.04 U	5.70 J	0.34 -	14.50 -	0.43 U
A1P2-S3SA-11-10B-RM	1.50 -	1.17 -	1.16 -	1.17 -	10.47 -	1.25 U	1.09 U	6.85 J	0.55 -	20.10 -	0.59 U
A1P2-S3SA-11-11B-RM	1.54 -	1.23 -	1.22 -	1.23 -	8.31 -	1.32 U	1.09 U	3.39 UJ	0.62 -	16.90 -	0.45 U
A1P2-S3SA-11-12B-RM	1.54 -	1.08 J	1.06 J	1.08 J	14.07 J	1.21 U	1.08 U	7.58 J	0.78 -	19.30 -	0.45 U
A1P2-S3SA-11-12B-RM-D	1.54 -	1.29 J	1.26 J	1.29 J	7.26 J	1.25 U	1.17 -	5.49 J	0.87 -	19.60 -	0.47 U
A1P2-S3SA-11-13B-RM	1.56 -	1.28 -	1.22 -	1.28 -	5.51 -	1.24 U	1.11 U	3.47 UJ	0.62 -	18.10 -	0.46 U
A1P2-S3SA-11-14B-RM	0.75 -	0.70 -	0.68 -	0.70 -	2.43 U	1.31 U	1.14 -	3.14 UJ	0.21 -	11.90 -	0.58 U
A1P2-S3SA-11-15B-RM	1.49 -	1.22 -	1.22 -	1.22 -	3.78 J	1.21 U	1.00 U	7.92 J	0.87 -	24.20 -	0.54 U
A1P2-S3SA-11-16B-RM	1.12 -	0.93 -	0.94 -	0.93 -	2.22 U	1.45 U	1.53 -	5.44 J	0.24 -	13.30 -	0.64 U
FRL	1.70	1.80	1.70	1.50	82.00	30.00	10.00	12.00	1.50	400.00	130.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	ug/g	ug/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%	90%	90%	90%	90%
Max Result	1.57 @	1.29 @	1.28 @	1.29 @	14.07 @	1.45 U @	2.60 @	11.40 @	0.87 @	24.20 @	2.81 U @
Standardized Skewness	--	--	--	--	--	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--	--	--
Sample Size	16	16	16	16	16	16	16	16	16	16	16
Estimated Mean	--	--	--	--	--	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--	--	--	--	--
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
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NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix B: Certification Statistics for A1P2-S2LL-01

Sample ID	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2LL-01-01B-RM	0.89 -	0.71 -	0.70 -	0.71 -	2.38 U	2.83 U	13.50 J
A1P2-S2LL-01-02B-RM	0.92 -	0.76 -	0.75 -	0.76 -	2.93 J	2.73 U	12.30 J
A1P2-S2LL-01-03B-RM	1.17 -	0.88 -	0.88 -	0.88 -	2.29 U	6.53 J	20.40 J
A1P2-S2LL-01-04B-RM	0.90 -	0.71 -	0.71 -	0.71 -	2.49 U	2.51 U	12.30 J
A1P2-S2LL-01-05B-RM	0.60 -	0.40 -	0.39 -	0.40 -	2.05 U	3.06 J	9.69 J
A1P2-S2LL-01-06B-RM	0.88 -	0.70 -	0.69 -	0.70 -	2.90 J	2.79 U	13.00 J
A1P2-S2LL-01-07B-RM	0.85 -	0.65 -	0.65 -	0.65 -	2.47 U	2.64 U	11.70 J
A1P2-S2LL-01-07B-RM-D	0.75 -	0.64 -	0.64 -	0.64 -	2.26 U	2.52 U	11.50 J
A1P2-S2LL-01-08B-RM	0.85 -	0.69 -	0.67 -	0.69 -	2.63 J	2.48 U	11.90 J
A1P2-S2LL-01-09B-RM	0.80 -	0.66 -	0.65 -	0.66 -	2.25 J	3.36 J	11.60 J
A1P2-S2LL-01-10B-RM	0.94 -	0.72 -	0.71 -	0.72 -	2.66 J	2.58 U	12.60 J
A1P2-S2LL-01-11B-RM	0.75 -	0.71 -	0.70 -	0.71 -	1.77 J	3.52 J	16.60 J
A1P2-S2LL-01-12B-RM	0.82 -	0.75 -	0.73 -	0.75 -	2.60 J	2.65 U	13.30 J
A1P2-S2LL-01-13B-RM	0.82 -	0.55 -	0.50 -	0.55 -	2.63 U	4.77 J	11.70 J
A1P2-S2LL-01-14B-RM	0.90 -	0.59 -	0.57 -	0.59 -	6.60 J	2.95 J	11.80 J
A1P2-S2LL-01-15B-RM	0.75 -	0.58 -	0.56 -	0.58 -	2.66 U	2.72 U	13.30 J
A1P2-S2LL-01-16B-RM	0.81 -	0.60 -	0.58 -	0.60 -	2.59 U	3.60 J	10.30 J
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.17 @	0.88 @	0.88 @	0.88 @	6.60 @	6.53 @	20.40 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability[1]	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	16	16	16	16	16	16	16
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean[2]	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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

NOTES:
@ Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
The maximum value of the two duplicates was used in all statistical equations.
[1] W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
[2] Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).
For reported non-detect results - one half of the detection limit was used in subsequent statistical calculations.

Appendix B: Certification Statistics for A1P2-S2LL-02

Sample ID	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2LL-02-01-RM	1.18 -	0.90 -	0.86 -	0.90 -	4.57 -	8.47 -	19.20 -
A1P2-S2LL-02-03-RM	1.13 -	0.96 -	0.94 -	0.96 -	2.80 U	6.36 -	15.80 -
A1P2-S2LL-02-04-RM	1.11 -	0.93 -	0.91 -	0.93 -	13.97 -	5.91 -	19.80 -
A1P2-S2LL-02-05-RM	1.26 -	1.06 -	1.04 -	1.06 -	5.59 J	7.33 -	18.00 -
A1P2-S2LL-02-05-RM-D	1.26 -	0.96 -	0.96 -	0.96 -	2.41 U	7.52 -	15.90 -
A1P2-S2LL-02-06-RM	1.21 -	0.93 -	0.91 -	0.93 -	16.04 -	6.29 -	18.10 -
A1P2-S2LL-02-08-RM	1.17 -	0.94 -	0.92 -	0.94 -	5.74 -	7.68 -	16.00 -
A1P2-S2LL-02-10-RM	1.22 -	0.92 -	0.91 -	0.92 -	5.73 -	3.06 -	17.70 -
A1P2-S2LL-02-11-RM	1.24 -	1.04 -	1.01 -	1.04 -	7.00 -	6.48 -	18.20 -
A1P2-S2LL-02-12-RM	1.29 -	1.10 -	1.09 -	1.10 -	9.27 -	6.17 -	21.50 -
A1P2-S2LL-02-13-RM	1.34 -	1.09 -	1.07 -	1.09 -	5.85 -	4.83 -	20.70 -
A1P2-S2LL-02-15-RM	1.29 -	1.10 -	1.06 -	1.10 -	25.27 -	7.12 -	71.30 -
A1P2-S2LL-02-16-RM	1.35 -	1.18 -	1.14 -	1.18 -	53.66 -	8.46 -	46.80 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.35 @	1.18 @	1.14 @	1.18 @	53.66 @	8.47 @	71.30 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability[1]	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean[2]	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
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NOTES:

@ Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

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

[1] W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.

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

For reported non-detect results - one half of the detection limit was used in subsequent statistical calculations.

Appendix B: Certification Statistics for A1P2-S2NI-01

Sample ID	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2NI-01-01-R	1.18 -	0.93 -	0.91 -	0.93 -	4.86 -	5.72 J	17.20 -
A1P2-S2NI-01-02-R	0.67 -	0.53 -	0.56 -	0.53 -	4.25 -	2.54 U	5.81 -
A1P2-S2NI-01-04-R	0.63 -	0.48 -	0.48 -	0.48 -	2.50 J	2.58 U	14.10 -
A1P2-S2NI-01-05-R	0.70 -	0.67 -	0.65 -	0.67 -	11.07 -	5.63 J	18.00 -
A1P2-S2NI-01-06-R	0.95 -	0.79 -	0.78 -	0.79 -	4.50 -	2.99 J	18.10 -
A1P2-S2NI-01-08-R	1.01 -	0.87 -	0.84 -	0.87 -	6.12 -	2.87 U	15.70 -
A1P2-S2NI-01-09-R	1.04 -	0.82 -	0.80 -	0.82 -	5.18 -	5.04 J	18.50 -
A1P2-S2NI-01-10-R	0.97 -	0.86 -	0.86 -	0.86 -	6.07 U	4.19 J	18.20 -
A1P2-S2NI-01-10-R-D	0.99 -	0.83 -	0.82 -	0.83 -	2.95 U	2.53 U	18.60 -
A1P2-S2NI-01-11-R	1.01 -	0.87 -	0.86 -	0.87 -	6.43 -	6.70 J	17.10 -
A1P2-S2NI-01-13-R	0.95 -	0.81 -	0.80 -	0.81 -	7.16 -	5.87 J	19.80 -
A1P2-S2NI-01-15-R	1.06 -	0.87 -	0.85 -	0.87 -	12.08 -	5.71 J	23.00 -
A1P2-S2NI-01-16-R	1.05 -	0.85 -	0.84 -	0.85 -	6.53 -	7.72 J	20.00 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.18 @	0.93 @	0.91 @	0.93 @	12.08 @	7.72 @	23.00 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability[1]	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean[2]	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
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"NV" = not validated
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NOTES:
@ Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
The maximum value of the two duplicates was used in all statistical equations.
[1] W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
[2] Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).
For reported non-detect results - one half of the detection limit was used in subsequent statistical calculations.

Appendix B: Certification Statistics for A1P2-S2NI-02

	RADIONUCLIDES					METALS	
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2NI-02-01-R	0.98 -	0.91 -	0.89 -	0.91 -	5.24 -	9.69 -	30.50 -
A1P2-S2NI-02-02-R	1.46 -	1.09 -	1.08 -	1.09 -	13.20 -	9.86 -	19.10 -
A1P2-S2NI-02-03-R	1.00 -	0.83 -	0.82 -	0.83 -	5.97 -	10.70 -	19.40 -
A1P2-S2NI-02-05-R	0.99 -	0.94 -	0.92 -	0.94 -	15.26 -	3.67 -	17.60 -
A1P2-S2NI-02-06-R	1.05 -	1.05 -	1.03 -	1.05 -	7.67 -	4.91 -	15.70 -
A1P2-S2NI-02-07-R	0.99 -	0.88 -	0.85 -	0.88 -	18.42 -	6.96 J	16.00 -
A1P2-S2NI-02-07-R-D	1.03 -	0.91 -	0.90 -	0.91 -	18.96 -	4.58 J	18.00 -
A1P2-S2NI-02-09-R	1.14 -	1.09 -	1.08 -	1.09 -	21.46 -	7.28 -	22.80 -
A1P2-S2NI-02-11-R	0.97 -	0.85 -	0.85 -	0.85 -	8.64 -	7.76 -	17.40 -
A1P2-S2NI-02-12-R	1.05 -	0.85 -	0.85 -	0.85 -	10.31 -	7.38 -	18.40 -
A1P2-S2NI-02-13-R	1.19 -	1.07 -	1.05 -	1.07 -	4.54 -	7.89 -	19.50 -
A1P2-S2NI-02-14-R	1.31 -	1.09 -	1.07 -	1.09 -	10.46 -	8.08 -	31.00 -
A1P2-S2NI-02-15-R	0.73 -	0.70 -	0.69 -	0.70 -	2.63 U	2.45 U	11.80 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.46 @	1.09 @	1.08 @	1.09 @	21.46 @	10.70 @	31.00 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability[1]	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean[2]	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample Size calculation	--	--	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
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NOTES:
@ Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
The maximum value of the two duplicates was used in all statistical equations.
[1] W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
[2] Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).
For reported non-detect results - one half of the detection limit was used in subsequent statistical calculations.

Appendix B: Certification Statistics for A1P2-S2NI-07

Sample ID	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2NI-07-02-R	1.03 -	0.90 -	0.86 -	0.90 -	3.53 J	2.63 UJ	18.90 J
A1P2-S2NI-07-02-R-D	1.05 -	0.89 -	0.86 -	0.89 -	3.44 J	7.18 J	19.70 J
A1P2-S2NI-07-03-R	0.88 -	0.79 -	0.80 -	0.79 -	3.12 J	2.59 UJ	14.80 J
A1P2-S2NI-07-04-R	1.02 -	0.87 -	0.86 -	0.87 -	2.42 J	8.80 J	20.80 J
A1P2-S2NI-07-05-R	0.97 -	0.89 -	0.88 -	0.89 -	4.13 J	9.86 J	21.30 J
A1P2-S2NI-07-06-R	0.89 -	0.76 -	0.73 -	0.76 -	8.64 J	3.08 J	16.30 J
A1P2-S2NI-07-07-R	1.03 -	0.89 -	0.88 -	0.89 -	2.95 J	4.89 J	15.60 J
A1P2-S2NI-07-09-R	0.80 -	0.72 -	0.69 -	0.72 -	5.17 J	5.99 J	15.80 J
A1P2-S2NI-07-10-R	1.04 -	0.90 -	0.89 -	0.90 -	2.63 U	3.76 J	15.00 J
A1P2-S2NI-07-11-R	0.94 -	0.81 -	0.77 -	0.81 -	2.20 U	4.45 J	17.60 J
A1P2-S2NI-07-13-R	1.25 -	1.10 -	1.08 -	1.10 -	4.00 J	11.00 J	24.80 J
A1P2-S2NI-07-15-R	0.92 -	0.74 -	0.73 -	0.74 -	3.87 J	5.53 J	13.80 J
A1P2-S2NI-07-16-R	0.86 -	0.66 -	0.68 -	0.66 -	2.55 U	5.38 J	12.70 J
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.25 @	1.10 @	1.08 @	1.10 @	8.64 @	11.00 @	24.80 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability[1]	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean[2]	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample Size calculation	--	--	--	--	--	--	--

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

NOTES:
@ Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
The maximum value of the two duplicates was used in all statistical equations.
[1] W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
[2] Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).
For reported non-detect results - one half of the detection limit was used in subsequent statistical calculations.

Appendix B: Certification Statistics for A1P2-S2NI-08

Sample ID	RADIONUCLIDES						
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2NI-08-01-RM	0.98 -	0.88 -	0.85 -	0.88 -	6.89 -	7.82 -	33.40 J
A1P2-S2NI-08-02-RM	0.97 -	0.87 -	0.85 -	0.87 -	8.60 -	5.90 -	40.70 J
A1P2-S2NI-08-04-RM	0.13 -	0.10 -	0.09 -	0.10 -	3.97 U	2.44 -	4.57 J
A1P2-S2NI-08-05-RM	1.03 -	1.05 -	1.05 -	1.05 -	57.22 -	4.06 -	38.80 J
A1P2-S2NI-08-07-RM	0.97 -	0.76 -	0.75 -	0.76 -	8.03 -	3.75 J	17.50 J
A1P2-S2NI-08-07-RM-D	1.02 -	0.79 -	0.79 -	0.79 -	6.71 -	2.71 U	14.50 J
A1P2-S2NI-08-08-RM	1.19 -	0.90 -	0.89 -	0.90 -	5.96 -	11.40 -	19.00 J
A1P2-S2NI-08-09-RM	0.90 -	0.61 -	0.60 -	0.61 -	6.10 -	6.19 -	15.00 J
A1P2-S2NI-08-10-RM	1.17 -	0.94 -	0.92 -	0.94 -	7.44 U	4.79 -	19.70 J
A1P2-S2NI-08-11-RM	0.95 -	0.88 -	0.86 -	0.88 -	35.55 -	6.55 -	29.70 J
A1P2-S2NI-08-13-RM	0.87 -	0.63 -	0.64 -	0.63 -	7.92 -	2.76 U	10.60 J
A1P2-S2NI-08-14-RM	1.62 -	1.15 -	1.12 -	1.15 -	7.54 U	4.73 -	24.60 J
A1P2-S2NI-08-15-RM	1.46 -	1.12 -	1.12 -	1.12 -	4.60 -	11.60 -	24.20 J
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.62 @	1.15 @	1.12 @	1.15 @	57.22 @	11.60 @	40.70 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability[1]	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean[2]	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample Size calculation	--	--	--	--	--	--	--

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

NOTES:

@ Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

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

[1] W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.

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

For reported non-detect results - one half of the detection limit was used in subsequent statistical calculations.

Appendix B: Certification Statistics for A1P2-S2OS-01

Sample ID	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2OS-01-01-RM	1.29 -	1.06 -	1.03 -	1.06 -	9.57 -	3.77 -	24.10 -
A1P2-S2OS-01-02-RM	1.19 -	0.98 -	0.93 -	0.98 -	14.24 -	8.18 -	20.30 -
A1P2-S2OS-01-04-RM	1.07 -	0.77 -	0.76 -	0.77 -	4.35 -	5.71 -	16.00 -
A1P2-S2OS-01-05-RM	1.22 -	0.98 -	0.95 -	0.98 -	13.24 -	10.20 -	18.20 -
A1P2-S2OS-01-06-RM	1.06 -	0.84 -	0.81 -	0.84 -	5.61 -	4.95 -	21.00 -
A1P2-S2OS-01-08-RM	1.32 -	1.07 -	1.04 -	1.07 -	4.97 -	8.11 -	19.00 -
A1P2-S2OS-01-10-RM	0.97 -	0.65 -	0.65 -	0.65 -	7.33 -	2.81 U	8.55 -
A1P2-S2OS-01-10-RM-D	0.94 -	0.70 -	0.69 -	0.70 -	9.80 -	2.91 U	13.40 -
A1P2-S2OS-01-11-RM	1.09 -	0.85 -	0.84 -	0.85 -	6.86 U	7.99 -	19.00 -
A1P2-S2OS-01-12-RM	0.96 -	0.72 -	0.71 -	0.72 -	5.28 -	6.08 -	14.40 -
A1P2-S2OS-01-13-RM	1.01 -	0.78 -	0.75 -	0.78 -	2.80 U	7.13 -	15.30 -
A1P2-S2OS-01-15-RM	1.02 -	0.74 -	0.71 -	0.74 -	9.39 -	4.08 -	14.10 -
A1P2-S2OS-01-16-RM	1.15 -	0.84 -	0.81 -	0.84 -	4.54 -	5.28 -	18.50 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.32 @	1.07 @	1.04 @	1.07 @	14.24 @	10.20 @	24.10 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability[1]	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean[2]	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample Size calculation	--	--	--	--	--	--	--

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

NOTES:
@ Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
The maximum value of the two duplicates was used in all statistical equations.
[1] W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
[2] Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).
For reported non-detect results - one half of the detection limit was used in subsequent statistical calculations.

Appendix B: Certification Statistics for A1P2-S2SB-01

Sample ID	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2SB-01-01-RM	1.38 J	1.35 J	1.32 J	1.35 J	3.49 J	8.05 J	25.10 -
A1P2-S2SB-01-02-RM	1.40 J	1.20 J	1.18 J	1.20 J	5.88 J	13.60 J	22.40 -
A1P2-S2SB-01-03-M						4.28 J	14.30 -
A1P2-S2SB-01-04-RM	1.21 J	1.08 J	1.05 J	1.08 J	3.95 J	7.92 J	19.20 -
A1P2-S2SB-01-05-RM	1.35 J	1.13 J	1.10 J	1.13 J	2.69 U	10.10 J	19.20 -
A1P2-S2SB-01-06-RM	1.05 J	0.86 J	0.84 J	0.86 J	2.48 U	11.90 J	22.00 -
A1P2-S2SB-01-07-M						3.86 U	20.90 -
A1P2-S2SB-01-08-RM	1.07 J	0.88 J	0.85 J	0.88 J	4.17 J	14.50 J	22.30 -
A1P2-S2SB-01-09-RM	1.34 J	1.20 J	1.19 J	1.20 J	2.91 J	8.59 J	22.40 -
A1P2-S2SB-01-10-M						3.83 J	12.70 -
A1P2-S2SB-01-11-RM	1.25 J	1.04 J	1.03 J	1.04 J	2.98 U	11.00 J	20.30 -
A1P2-S2SB-01-12-RM	1.34 J	1.12 J	1.09 J	1.12 J	3.78 J	5.00 J	16.90 -
A1P2-S2SB-01-12-RM-D	1.39 J	1.11 J	1.11 J	1.11 J	3.80 J	9.61 J	24.70 -
A1P2-S2SB-01-13-RM	1.23 J	1.01 -	0.98 -	1.01 -	2.58 U	10.70 J	20.50 -
A1P2-S2SB-01-14-M						9.52 J	22.50 -
A1P2-S2SB-01-15-RM	1.39 J	1.09 -	1.07 -	1.09 -	5.96 -	11.60 J	19.00 -
A1P2-S2SB-01-16-RM	1.02 J	0.82 -	0.80 -	0.82 -	4.18 -	11.80 J	23.90 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.40 @	1.35 @	1.32 @	1.35 @	5.96 @	14.50	25.10 @
Standardized Skewness	- -	- -	- -	- -	- -	-0.965	- -
W-Statistic Probability[1]	- -	- -	- -	- -	- -	29.4% (N)	- -
Test Procedure	- -	- -	- -	- -	- -	t-Test (N)	- -
Sample Size	12	12	12	12	12	16	16
Estimated Mean	- -	- -	- -	- -	- -	9.31	- -
UCL on the Mean[2]	- -	- -	- -	- -	- -	10.48	- -
Non-Parametric Prob.	- -	- -	- -	- -	- -	- -	- -
Est. Mean - Pass / Fail	- -	- -	- -	- -	- -	Pass	- -
2x Rule Pass / Fail	- -	- -	- -	- -	- -	Pass	- -
a posteriori Sample	- -	- -	- -	- -	- -	9	- -
Size calculation	- -	- -	- -	- -	- -	Pass	- -

Definition of Qualifiers
"J" = estimated result
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"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not validated

NOTES:
@ Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
The maximum value of the two duplicates was used in all statistical equations.
[1] W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
[2] Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).
For reported non-detect results - one half of the detection limit was used in subsequent statistical calculations.

000155

Appendix B: Certification Statistics for A1P2-S2SB-02

Sample ID	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2SB-02-01-RM	1.09 -	0.98 -	0.96 -	0.98 -	5.11 -	7.02 J	19.60 -
A1P2-S2SB-02-02-RM	1.10 -	0.95 -	0.91 -	0.95 -	4.78 -	3.04 U	16.60 -
A1P2-S2SB-02-04-RM	0.89 -	0.78 -	0.76 -	0.78 -	3.67 -	3.78 J	16.40 -
A1P2-S2SB-02-05-RM	1.34 -	1.07 -	1.05 -	1.07 -	2.74 U	4.65 J	16.00 -
A1P2-S2SB-02-06-RM	1.13 -	0.88 -	0.85 -	0.88 -	3.43 -	3.52 J	19.60 -
A1P2-S2SB-02-06-RM-D	1.20 -	0.99 -	0.96 -	0.99 -	4.26 -	4.72 J	17.00 -
A1P2-S2SB-02-08-RM	1.13 -	0.98 -	0.95 -	0.98 -	2.91 U	7.12 J	16.00 -
A1P2-S2SB-02-09-RM	1.08 -	0.95 -	0.95 -	0.95 -	3.81 -	4.62 J	15.80 -
A1P2-S2SB-02-10-RM	0.76 -	0.83 -	0.80 -	0.83 -	2.84 U	5.35 J	17.30 -
A1P2-S2SB-02-11-RM	0.91 -	0.76 -	0.74 -	0.76 -	2.95 U	2.56 J	14.70 -
A1P2-S2SB-02-13-RM	0.91 -	0.74 -	0.74 -	0.74 -	6.64 -	2.71 U	10.20 -
A1P2-S2SB-02-14-RM	0.89 -	0.74 -	0.73 -	0.74 -	3.53 -	4.63 J	18.90 -
A1P2-S2SB-02-16-RM	1.07 -	0.86 -	0.84 -	0.86 -	6.06 -	3.04 U	13.50 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.34 @	1.07 @	1.05 @	1.07 @	6.64 @	7.12 @	19.60 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability[1]	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean[2]	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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

NOTES:
@ Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
The maximum value of the two duplicates was used in all statistical equations.
[1] W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
[2] Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).
For reported non-detect results - one half of the detection limit was used in subsequent statistical calculations.

Appendix B: Certification Statistics for A1P2-S2SB-04

Sample ID	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2SB-04-01-RM	0.96 -	0.87 -	0.84 -	0.87 -	4.34 -	2.62 U	15.00 -
A1P2-S2SB-04-03-RM	1.29 -	1.01 -	1.01 -	1.01 -	4.33 -	8.25 J	21.30 -
A1P2-S2SB-04-04-RM	0.81 -	0.60 -	0.57 -	0.60 -	5.09 -	3.86 J	14.60 -
A1P2-S2SB-04-05-RM	1.34 -	1.12 -	1.09 -	1.12 -	2.63 U	5.66 J	17.50 -
A1P2-S2SB-04-06-RM	1.07 -	0.82 -	0.78 -	0.82 -	4.64 -	4.90 J	17.60 -
A1P2-S2SB-04-08-RM	1.00 J	0.92 -	0.90 -	0.92 -	2.34 U	6.58 J	15.50 -
A1P2-S2SB-04-08-RM-D	0.83 J	0.81 -	0.80 -	0.81 -	2.49 U	4.05 J	15.90 -
A1P2-S2SB-04-10-RM	1.48 -	1.16 -	1.08 -	1.16 -	3.46 J	15.70 J	23.50 -
A1P2-S2SB-04-11-RM	1.47 -	1.16 -	1.14 -	1.16 -	2.51 U	3.05 U	20.10 -
A1P2-S2SB-04-12-RM	1.42 -	1.24 -	1.22 -	1.24 -	2.80 U	14.10 J	27.20 -
A1P2-S2SB-04-13-RM	1.19 -	0.96 -	0.96 -	0.96 -	10.92 -	3.44 J	15.70 -
A1P2-S2SB-04-14-RM	1.22 -	1.08 -	1.05 -	1.08 -	5.26 -	5.95 J	22.00 -
A1P2-S2SB-04-16-RM	1.22 -	1.08 -	1.08 -	1.08 -	2.84 U	4.58 J	22.30 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.48 @	1.24 @	1.22 @	1.24 @	10.92 @	15.70	27.20 @
Standardized Skewness	--	--	--	--	--	1.921	--
W-Statistic Probability[1]	--	--	--	--	--	55.3% (LN)	--
Test Procedure	--	--	--	--	--	t-Test (LN)	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	6.61	--
UCL on the Mean[2]	--	--	--	--	--	9.92	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	Pass	--
2x Rule Pass / Fail	--	--	--	--	--	Pass	--
a posteriori Sample	--	--	--	--	--	5	--
Size calculation	--	--	--	--	--	Pass	--

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

NOTES:

@ Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

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

[1] W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.

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

For reported non-detect results - one half of the detection limit was used in subsequent statistical calculations.

000157

Certification Statistics for A1P2-S2SP-01

Sample ID	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2SP-01-01-RM	0.99 -	0.92 -	0.89 -	0.92 -	19.14 -	3.41 -	17.10 -
A1P2-S2SP-01-03-RM	1.15 -	1.10 -	1.07 -	1.10 -	24.00 -	6.30 -	22.10 -
A1P2-S2SP-01-04-RM	1.03 -	0.88 -	0.86 -	0.88 -	15.26 -	4.01 -	13.60 -
A1P2-S2SP-01-05-RM	1.14 -	1.13 -	1.10 -	1.13 -	24.25 -	5.59 -	19.90 -
A1P2-S2SP-01-07-RM	1.08 -	0.86 -	0.87 -	0.86 -	15.78 -	6.94 -	21.90 -
A1P2-S2SP-01-07-RM-D	1.11 -	0.98 -	0.96 -	0.98 -	14.84 -	7.06 -	20.60 -
A1P2-S2SP-01-08-RM	1.12 -	1.00 -	0.97 -	1.00 -	12.85 -	8.04 -	23.30 -
A1P2-S2SP-01-09-RM	1.22 -	0.98 -	0.95 -	0.98 -	18.91 -	8.59 -	26.20 -
A1P2-S2SP-01-10-RM	1.05 -	1.00 -	0.99 -	1.00 -	16.21 -	5.09 -	22.20 -
A1P2-S2SP-01-11-RM	0.94 -	0.77 -	0.75 -	0.77 -	12.97 -	2.64 -	18.60 -
A1P2-S2SP-01-13-RM	1.03 -	0.85 -	0.83 -	0.85 -	13.34 -	6.23 -	20.10 -
A1P2-S2SP-01-15-RM	1.15 -	0.95 -	0.93 -	0.95 -	18.47 -	4.94 -	17.50 -
A1P2-S2SP-01-16-RM	1.10 -	0.87 -	0.87 -	0.87 -	16.22 -	6.24 -	20.00 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.22 @	1.13 @	1.10 @	1.13 @	24.25 @	8.59 @	26.20 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability[1]	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean[2]	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample Size calculation	--	--	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
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"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not validated

NOTES:
@ Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
The maximum value of the two duplicates was used in all statistical equations.
[1] W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
[2] Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).
MDC The reported non-detect value was below the MDC - one half of the MDC was used in subsequent statistical calculations.

Certification Statistics for A1P2-S2SP-02

Sample ID	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2SP-02-01-RM	1.39 -	1.18 -	1.14 -	1.18 -	32.53 -	4.70 J	21.70 -
A1P2-S2SP-02-02-RM	1.28 -	0.96 -	0.94 -	0.96 -	10.12 -	2.92 UJ	17.40 -
A1P2-S2SP-02-02-RM-D	1.25 -	1.01 -	0.99 -	1.01 -	8.38 -	8.95 J	19.10 -
A1P2-S2SP-02-03-RM	1.16 -	1.01 -	0.99 -	1.01 -	21.36 -	3.93 J	20.10 -
A1P2-S2SP-02-05-RM	1.25 -	1.09 -	1.07 -	1.09 -	12.56 -	4.62 J	20.80 -
A1P2-S2SP-02-06-RM	1.10 -	0.77 -	0.76 -	0.77 -	5.55 -	3.44 J	10.60 -
A1P2-S2SP-02-07-RM	1.33 -	1.12 -	1.11 -	1.12 -	8.36 -	5.28 J	18.40 -
A1P2-S2SP-02-09-RM	1.20 -	1.02 -	1.02 -	1.02 -	10.39 -	3.91 J	24.50 -
A1P2-S2SP-02-10-RM	1.29 -	0.98 -	0.97 -	0.98 -	6.32 -	6.23 J	18.50 -
A1P2-S2SP-02-11-RM	1.18 -	0.98 -	0.98 -	0.98 -	9.54 -	2.72 U	14.60 -
A1P2-S2SP-02-14-RM	0.95 -	0.78 -	0.77 -	0.78 -	5.99 -	3.28 J	18.40 -
A1P2-S2SP-02-15-RM	1.26 -	0.95 -	0.94 -	0.95 -	4.23 -	7.05 J	17.20 -
A1P2-S2SP-02-16-RM	0.86 -	0.56 -	0.54 -	0.56 -	2.71 J	2.53 U	13.20 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.39 @	1.18 @	1.14 @	1.18 @	32.53 @	8.95 @	24.50 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability[1]	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean[2]	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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NOTES:

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

[1] W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.

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

MDC The reported non-detect value was below the MDC - one half of the MDC was used in subsequent statistical calculations.

Certification Statistics for A1P2-S2SP-04

Sample ID	RADIONUCLIDES					METALS	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Arsenic	Lead
A1P2-S2SP-04-01-RM	0.87 -	0.67 -	0.65 -	0.67 -	4.18 J	4.19 -	13.40 -
A1P2-S2SP-04-02-RM	1.33 -	1.11 -	1.10 -	1.11 -	14.87 J	2.90 -	20.40 -
A1P2-S2SP-04-02-RM-D	1.29 -	1.05 -	1.04 -	1.05 -	11.80 J	2.78 U	19.70 -
A1P2-S2SP-04-03-RM	1.06 -	0.87 -	0.86 -	0.87 -	5.36 J	2.89 -	15.80 -
A1P2-S2SP-04-05-RM	0.99 -	0.82 -	0.79 -	0.82 -	11.50 J	3.20 -	19.30 -
A1P2-S2SP-04-06-RM	1.41 -	1.22 -	1.20 -	1.22 -	5.56 J	9.04 -	22.50 -
A1P2-S2SP-04-08-RM	1.43 -	1.23 -	1.22 -	1.23 -	4.11 J	10.40 -	31.10 -
A1P2-S2SP-04-09-RM	0.97 -	0.87 -	0.87 -	0.87 -	17.70 J	3.58 -	15.60 -
A1P2-S2SP-04-10-RM	1.22 -	1.01 -	0.99 -	1.01 -	10.39 J	4.08 -	20.30 -
A1P2-S2SP-04-12-RM	1.54 -	1.26 -	1.23 -	1.26 -	3.53 J	8.70 -	41.90 -
A1P2-S2SP-04-14-RM	1.19 -	1.04 -	1.02 -	1.04 -	10.49 J	2.61 U	20.20 -
A1P2-S2SP-04-15-RM	0.91 -	0.80 -	0.79 -	0.80 -	5.69 J	2.57 U	19.20 -
A1P2-S2SP-04-16-RM	0.92 -	0.82 -	0.82 -	0.82 -	3.24 J	2.50 U	17.90 -
FRL	1.70	1.80	1.70	1.50	82.00	12.00	400.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	ug/g	ug/g
Confidence Level	95%	95%	95%	95%	95%	90%	90%
Max Result	1.54 @	1.26 @	1.23 @	1.26 @	17.70 @	10.40 @	41.90 @
Standardized Skewness	--	--	--	--	--	--	--
W-Statistic Probability[1]	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--	--
UCL on the Mean[2]	--	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--

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[1] W-Statistic Probability is the highest calculated 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 (Normal) and the log-transformed data (LogNormal) to test for lognormality.
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MDC The reported non-detect value was below the MDC - one half of the MDC was used in subsequent statistical calculations.

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