

CERTIFICATION REPORT FOR AREA 3A AND AREA 3B

**FERNALD CLOSURE PROJECT
FERNALD, OHIO**



DECEMBER 2004

**U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE**

**20803-RP-0003
REVISION A
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LIST OF ACRONYMS AND ABBREVIATIONS

A3A	Area 3A
A3B	Area 3B
ASCOC	area-specific constituent of concern
ASL	analytical support level
BTV	benchmark toxicity value
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	constituent of concern
CRDL	Contract Required Detection Limit
CU	certification unit
D&D	Decontamination and Demolition
DAF	dilution attenuation factor
DHWM	OEPA Division of Hazardous Waste Management
DOE	U.S. Department of Energy
DSDP	Demolition, Soil and Disposal Project
EPA	U.S. Environmental Protection Agency
FCP	Fernald Closure Project
FPA	Former Production Area
FRL	final remediation level
GC/MS	gas chromatography/mass spectrometry
GCN	General Cleanup Numbers
GMA	Great Miami Aquifer
HAMDC	highest allowable minimum detectable concentration
HPGe	high-purity germanium (detector)
HWMU	hazardous waste management unit
ICP-AES	inductively coupled plasma-atomic emission spectroscopy
ICP/MS	inductively coupled plasma-mass spectrometry
MDC	Main Drainage Corridor
µg/g	micrograms per gram
µg/kg	micrograms per kilogram
MDL	minimum detection level
mg/kg	milligrams per kilogram
OEPA	Ohio Environmental Protection Agency
OSDF	On-Site Disposal Facility
OU	Operable Unit
PAH	polyaromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
pCi/g	picoCuries per gram
PSP	Project Specific Plan
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision

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LIST OF ACRONYMS AND ABBREVIATIONS
(Continued)

SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
TCA	trichloroethane
TPU	total propagated uncertainty
UCL	Upper Confidence Limit
UST	underground storage tank
V/FCN	Variance/Field Change Notice
V&V	verification and validation
VOC	volatile organic compound
WAC	waste acceptance criteria
yd ³	cubic yards

EXECUTIVE SUMMARY

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This Certification Report presents the information and data used by the U.S. Department of Energy (DOE) to determine that soils in Areas 3A and 3B meet established final remediation levels (FRLs). Area 3A and Area 3B are located in the northeast quadrant of the Former Production Area (FPA) of the Fernald Closure Project (FCP). Predominant structures formerly located in Area 3A included: the Maintenance Building (12), the Boiler Plant (10A), Plant 9, and Building 64/65. Area 3A also includes the footprint of the former Incinerator Pad (10A), two underground storage tanks (USTs), UST #3 and a discovered UST in the former Plant 9, and two high-leachability zones where the FRL for total uranium is 20 milligrams per kilograms (mg/kg). The predominant structures formerly located in Area 3B included the Preparation Plant (1A), Plant 1 Storage Building (1B), Drum Reconditioning Building, Plant 1 Ore Silos (1C), NFS Storage and Pump House (2E), Conveyor Tunnel (2H), Chemical Warehouse (30A), Drum Storage Warehouse (30B), CP Storage Warehouse (56A), General In-Process Warehouse (71), and Plant 1 Storage Pad (74T). The majority of the Area 3B certification area is encompassed by Hazardous Waste Management Unit (HWMU) #20. Area 3B also includes one high-leachability zone where the final remediation level for total uranium is 20 mg/kg.

This Certification Report includes details of the certification sampling, analysis, and validation that took place in Areas 3A and 3B. The certification areas for 3A and 3B were reduced from a total of approximately 47 acres to approximately 27 acres due to the location of the Main Drainage Corridor (MDC) and the field location of the run-on/run-off controls. Figure 1-3 depicts the original layout of Areas 3A and 3B and Figure 1-1 depicts the areas in 3A and 3B that are being certified.

Consistent with the Sitewide Excavation Plan (SEP, DOE 1998), these areas underwent pre-design, excavation, and precertification activities, including the use of real-time instrumentation as well as physical sampling and analysis. As a result of these activities, it was determined that no further remediation was necessary prior to certification.

All Area 3A and Area 3B certification units (CUs) were sampled and statistical analysis was conducted where necessary to ensure certification criteria were met. As discussed in the Certification Design Letter and Certification Sampling Project Specific Plan for Area 3A and Area 3B (DOE 2004a and 2004b), the certification criteria are that the average primary area-specific constituent of concern (ASCOC)

1 concentrations within a CU are below-FRLs at a 95 percent upper confidence level (90 percent UCL for
2 secondary ASCOCs), and that no certification result is greater than twice the FRL (the hotspot criterion).

3
4 Although there were no CUs in either Area 3A or Area 3B that had any reported results greater than two
5 times the FRL, two CUs (A3A-C01 and A3A-C04) in Area 3A failed one of the certification requirements
6 (the UCL on the mean was greater than the FRL). A3A-C01 failed the 90 percent UCL for the secondary
7 ASCOC aroclor-1254 and A3A-C04 failed the 95 percent UCL for the primary ASCOC total uranium. In
8 each CU, the two locations with the highest results were excavated and the areas were re-sampled at the
9 excavated locations and at another random location within the respective sub-CU. Following the
10 re-sample, the pre-excavated data was replaced with the new surface data and the additional random
11 sample point data. Upon completion of final certification statistics, all Area 3A and Area 3B CUs pass the
12 certification criteria.

13
14 On the basis of this reported information and supporting project files, DOE has determined that no
15 additional remedial actions are required in this portion of the site. The area will be considered certified
16 when the U.S. Environmental Protection Agency (EPA) and the Ohio Environmental Protection Agency
17 (OEPA) concur that certification criteria have been met. At that time, DOE intends to proceed with final
18 land use activities as outlined in the Natural Resource Restoration Plan (DOE 2002a).

19
20 DOE has restricted access to certified areas in order to maintain their integrity prior to final land use
21 development. FCP procedure (EP-0008) has been developed to implement a process to protect certified
22 areas from becoming re-contaminated.

23

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 soils in Areas 3A and 3B meet established final remediation levels (FRLs). Area 3A and Area 3B, as defined for this certification effort, are located in the northern half of the Former Production Area (FPA) of the Fernald Closure Project (FCP) and consists of the former Plant 1 Pad, Boiler Plant, Maintenance Building, Plants 4, 5, 6, 7, and 9, roads, perimeter areas, etc. (see Figure 1-1). On the basis of this reported information and supporting project files, DOE has determined that no additional remedial actions are required in this portion of the site.

1.2 BACKGROUND

In the Operable Unit (OU) 5 Record of Decision (ROD, DOE 1996a), DOE made a commitment to excavate contaminated soil that exceeds health-based FRLs. The excavated material may be disposed of at the On-Site Disposal Facility (OSDF) or at an off-site disposal facility if it does not meet OSDF waste acceptance criteria (WAC). The OU5 Remedial Investigation Report (RI, DOE 1995a) defined the extent of above-FRL soil contamination and, in general, indicated widespread contamination occurring in approximately 430 acres of the 1,050-acre FCP.

In the OU5 Remedial Action Work Plan (RAWP, DOE 1996b), DOE agreed to prepare a Sitewide Excavation Plan (SEP, DOE 1998) that defined the overall approach to cleaning up soil and at- and below-grade debris in accordance with the OU2 (DOE 1995b), OU3 ROD (DOE 1996c), and OU5 ROD.

In the SEP, the FCP was divided into distinct remedial areas and phases for soil remediation, based on the operable units' remediation schedule. After all necessary remediation is completed within each area/phase, the soil is certified as having attained all clean up goals (i.e., FRLs). The general approach for the removal of contaminated soil and debris in Areas 3A and 3B followed "Excavation Approach D – Excavation Following D&D in the Former Production Area, STP and FTF," as described in Section 4.4 of the SEP.

1.3 SCOPE AND AREA DESCRIPTION

The scope of this Certification Report includes details of the certification sampling, analysis, and validation that took place in Areas 3A and 3B. The certification areas for Areas 3A and 3B were reduced due to the location of the Main Drainage Corridor (MDC), as depicted in Figure 1-2, and the field location

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1 of the run-on/run-off controls, which were based on the current area topography. Figure 1-3 depicts the
2 original layout of Areas 3A and 3B and Figure 1-1 depicts the areas in 3A and 3B that are being certified.

3
4 Area 3A

5 Area 3A is located in the northeast quadrant of the FPA, and is bound by the Impacted Material Haul Road
6 to the north, "E" Street to the east, 2nd Street to the south, and "B" street to the west. Predominant
7 structures formerly located in Area 3A included: the Maintenance Building (12), the Boiler Plant (10A),
8 Plant 9, and Building 64/65. Area 3A also includes the footprint of the former Incinerator Pad (10D), two
9 underground storage tanks (USTs), UST #3 and a discovered UST in the former Plant 9, and two
10 high-leachability zones where the uranium FRL is lower at 20 milligram per kilogram (mg/kg). The entire
11 Area 3A was approximately 24 acres. However, due to the location of the MDC and the field location of
12 the run-on/run-off controls, only approximately 16 acres have been included in the scope of this
13 certification (Figure 1-1). The Area 3A perimeter to the north, to the east, and to the west outside of the
14 run-on control ditches, and UST #6 will be included in the scope of the MDC Certification Design Letter
15 (CDL) or another adjacent area.

16
17 Area 3B

18 Originally, area 3B was approximately 23 acres; however, only 11 acres are being certified at this time due
19 to some of the area being consumed for run-on control ditches and the MDC (Figure 1-1). The area lies in
20 the northwest quadrant of the FPA. The area is bound by the Impacted Material Haul Road to the North,
21 "B" Street to the east, 2nd Street to the south, and the FPA fence line to the west. Facilities previously
22 located in Area 3B included the Preparation Plant (1A), Plant 1 Storage Building (1B), Drum
23 Reconditioning Building, Plant 1 Ore Silos (1C), NFS Storage and Pump House (2E), Conveyor Tunnel
24 (2H), Chemical Warehouse (30A), Drum Storage Warehouse (30B), CP Storage Warehouse (56A),
25 General In Process Warehouse (71), and Plant 1 Storage Pad (74T). Plant 1 Storage Pad also encompasses
26 Hazardous Waste Management Unit (HWMU) #20.

27
28 While the majority of Area 3B is included in the scope of this certification, a portion of the area is not
29 scheduled for certification at this time due to the location of the run-on control ditch. HWMU #20 is also
30 being closed under the scope of this certification.

31
32 The final certification boundaries, with the exception of the southwest corner of the area, were bound on
33 the west, north, and east sides by the designed run-on and run-off control drainage ditches. These ditches

1 now include storm water collection capacity, which had been previously planned to be within Area 4B.
2 Because Area 4B is not fully excavated as planned, the storm water management area had to be relocated
3 to the southwest portion of Area 3B. The southwest corner of the original area was established to contain
4 any water draining from the ditches for the entire Area 3B. Therefore, this area along with the rest of the
5 run-on control ditches will not be included in the scope of this certification. Originally, any run-off water
6 was going to be contained within Area 4B; however, 2nd Street could not be removed since it is still
7 necessary for hauling soil to the cell.

8
9 **1.4 OBJECTIVES**

10 The objectives of this Certification Report are:

- 11 • Summarize the precertification and remedial activities,
- 12 • Describe the analytical methods, data validation processes, data reduction and statistical processes
13 used to support the certification process,
- 14 • Present certification sampling results for all certification units (CUs),
- 15 • Present the statistical analysis showing that all CUs have passed the certification criteria, including
16 FRL attainment and hotspot criteria, and
- 17 • Describe access controls implemented to prevent recontamination.

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24 **1.5 REPORT FORMAT**

25 This Certification Report is presented in six sections with supporting documentation and data in the
26 appendices. These sections are as follows:

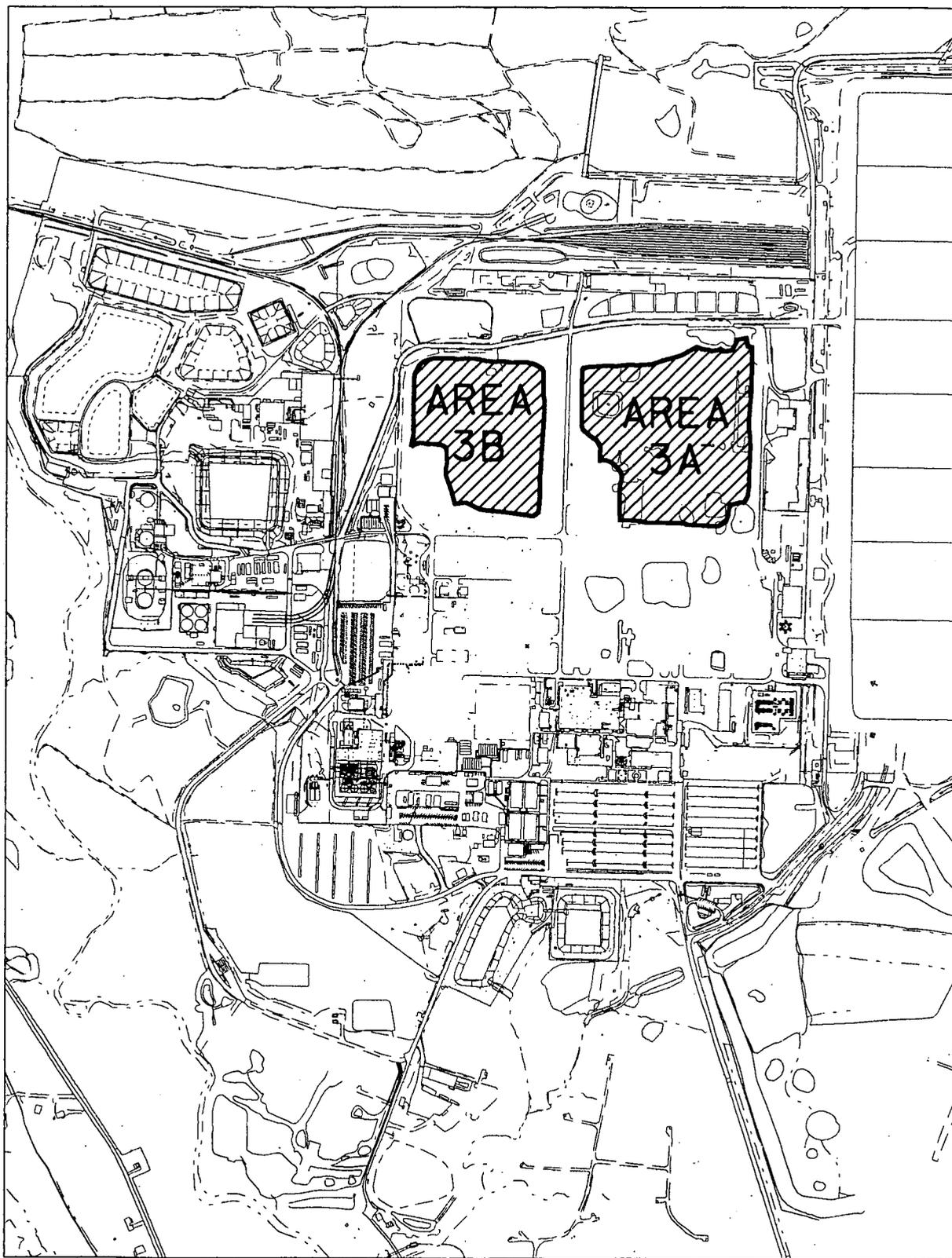
- 27 Section 1.0 Introduction: Purpose, background, area description, scope, and objectives of the report
- 28 Section 2.0 Certification Approach: The approach for certification sampling and analysis
- 29 Section 3.0 Overview of Field Activities: Historical data evaluation, precertification, area
30 preparation, excavation and changes to work scope
- 31 Section 4.0 Analytical Methodologies, Data Validation Processes and Data Reduction
- 32 Section 5.0 Certification Evaluation and Conclusions
- 33 Section 6.0 Protection of Certified Areas
- 34 Appendix A Failing Preliminary Certification Statistics

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- 1 Appendix B Certification Samples, Analytical Results and Final Statistics Tables
- 2
- 3 Appendix C Variances/Field Change Notices (V/FCNs) for the Area 3A and Area 3B Certification
- 4 Sampling Project Specific Plan (PSP)
- 5
- 6 Appendix D HWMU #20 Resource Conservation and Recovery Act (RCRA) Calculations and
- 7 Graphs
- 8

9 1.6 FCP MASTER CERTIFICATION MAP

10 In order to track certification and characterization for reuse areas at the FCP, DOE updates a controlled
11 map (Figure 1-2) showing the status of the soil remediation areas and phased areas with all Certification
12 Reports. This map has been updated to include certification of Area 3A and Area 3B.



LEGEND:

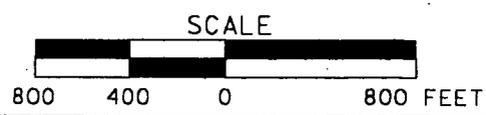
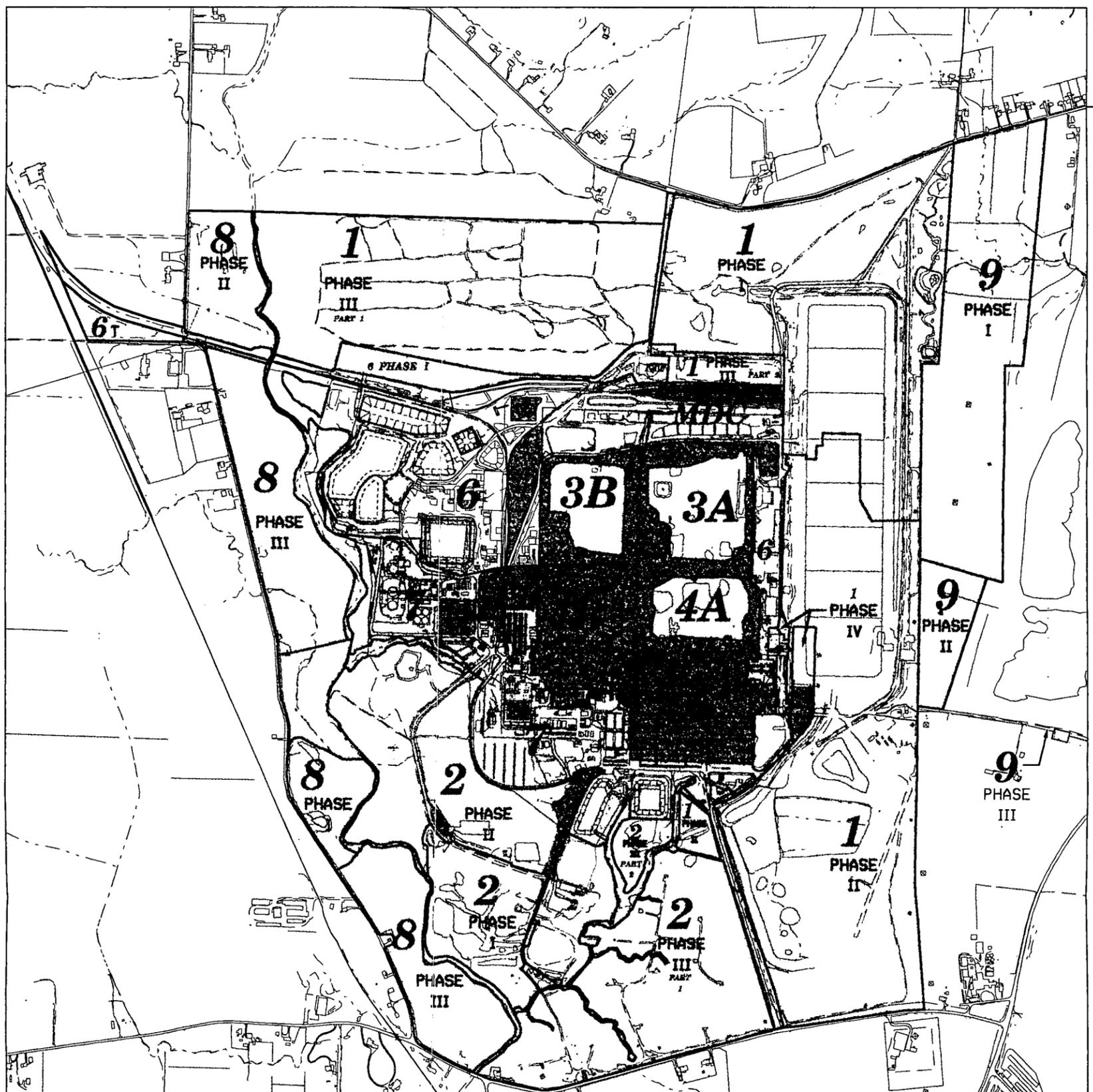


FIGURE 1-1. AREA 3A AND AREA 3B CERTIFICATION AREA BOUNDARIES



revised December 9, 2004

AREAS	TOTAL ACRES	APPROVED CERT. ACRES	CERT. ACRES IN PROGRESS	PREDESIGN ACRES IN PROGRESS	REMAINING ACRES
AREA 1	395.0	393.0	0.2	1.7	0
AREA 2	175.0	160.4	1.7	3.9	0
AREA 3A/4A	26.9	16.4	10.6	0	0
AREA 3B/4B	31.0	11.1	0	19.9	0
AREA 5	27.1	3.2	0	23.9	0
AREA 6	142.0	18.8	1.4	7.7	36.2
AREA 7	84.2	0	0	7.2	0
AREA 8	98.9	98.9	0	0	0
AREA 9	0.7	0	0	0	0.75*
MDC	36.4	0	0	36.3	0
PR/SSOD/PPDD	32.3	0	0	0	32.3
TOTAL ON SITE	1049.5	701.8	13.9	100.7	196.1
AREA 9	85.6	84.5	1.1	0	0
TOTAL OFF SITE	85.6	84.5	1.1	0	0

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

API ROADS EXCLUDED FROM CERTIFICATION IDENTIFIED AS: [REDACTED].

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

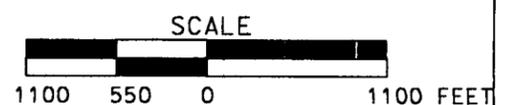
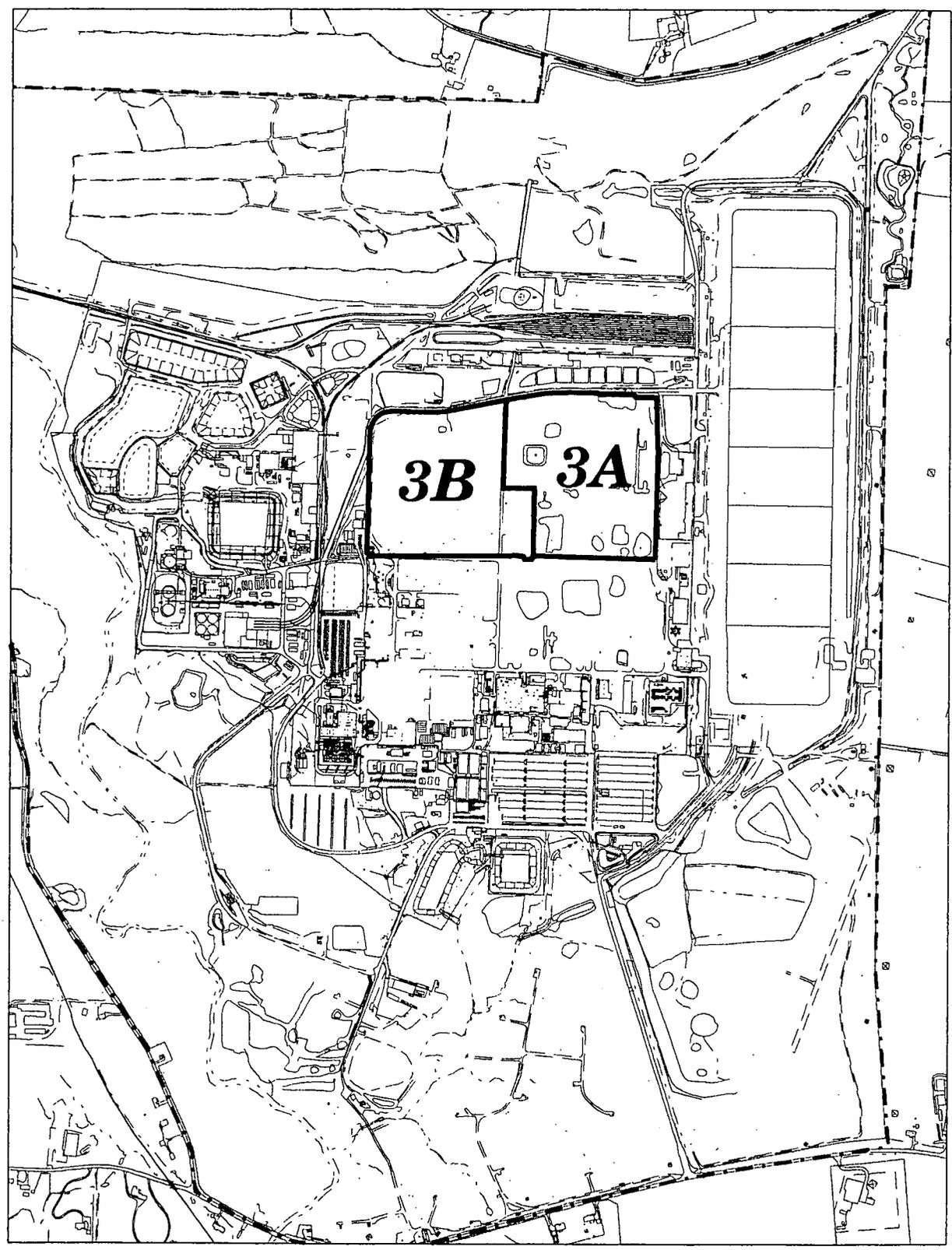


FIGURE 1-2. FCP CONTROLLED CERTIFICATION MAP

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STATE PLANAR COORDINATE SYSTEM 1983

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----- FCP BOUNDARY

SCALE

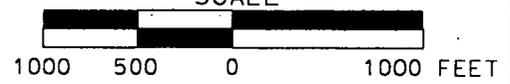


FIGURE 1-3. AREA 3A AND AREA 3B LOCATION MAP

2.0 CERTIFICATION APPROACH

2.1 CERTIFICATION STRATEGY

This section summarizes the area-specific constituent of concern (ASCOC) selection process and the certification approach, including CU establishment, sampling design, and statistical analysis. The general certification strategy is described in Section 3.4 of the SEP, and the specific strategy for Area 3A and Area 3B is described in the CDL for Area 3A and Area 3B (DOE 2004a).

2.1.1 Area-Specific Constituents of Concern

Total uranium, radium-226, radium-228, thorium-228 and thorium-232 are sitewide primary constituents of concern (COCs) and were retained as ASCOCs for this remediation effort. Secondary ASCOCs for Area 3 are listed in the SEP; however, some COCs were not retained for Areas 3A or 3B based on the area investigations. Table 2-1 lists the secondary ASCOCs identified in the SEP. Table 2-2 presents justification for retaining or not retaining the ASCOCs and the ecological COCs for each CU in Area 3A certification and Table 2-3 presents justification for retaining or not retaining the secondary ASCOCs and the ecological COCs identified in the SEP for each CU in Area 3B.

2.1.2 ASCOC Selection Criteria

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

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

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1 Using the above process, the ASCOCs were refined to those listed in Table 2-7 of the SEP. The list of
2 ASCOCs is also presented in Table 2-1 with their respective FRLs and, if applicable, benchmark toxicity
3 values (BTVs).

4
5 Table 2-7 of the SEP also identifies several additional COCs as ecological COCs based on a screening
6 process presented in Appendix C of the SEP. For Areas 3A and 3B, the ecological COCs include four
7 metals (antimony, cadmium, molybdenum, and silver) plus polyaromatic hydrocarbons (PAHs). As
8 discussed in Section C.4.1.4.2 of the SEP, the metals and PAHs are listed for Area 3 specifically due to
9 their presence in the FPA. While cadmium, molybdenum, and silver were identified in both Areas 3A
10 and 3B, antimony was only identified in Area 3B. PAHs were only identified in Area 3A, specifically
11 north of the Maintenance Building. Cadmium, molybdenum, and silver were carried into certification
12 sampling and analysis for all Area 3A and 3B CUs while antimony was limited to the Area 3B CUs. The
13 PAHs were limited to CUs 1, 12, 13, 15, and 16 in Area 3A based on Figure C-8 from Appendix C of the
14 SEP. While these ecological COCs are being added to certification sampling and analysis, certification is
15 not necessarily contingent on BTV data.

16 17 2.1.3 ASCOC Selection Process

18 Each COC on the Remediation Area 3 ASCOC list (Table 2-1) was evaluated for its relevance to Area 3A
19 and Area 3B separately. Table 2-2 presents the reasoning for either retaining or eliminating the ASCOCs
20 for each CU in Area 3A. In addition to the assigned COCs for Remediation Area 3, another COC with
21 above-WAC concentrations in Area 3A includes 1,2-dichloroethene, which will be retained for
22 certification. Table 2-3 presents the reasoning for either retaining or eliminating the ASCOCs for each CU
23 in Area 3B.

24 25 2.2 CERTIFICATION APPROACH

26 2.2.1 Certification Design

27 The certification design for Area 3A and Area 3B follows the general approach outlined in Section 3.4 of
28 the SEP. The design for Area 3A is depicted on Figure 2-1 and the sample locations are depicted in
29 Figures 2-2 through 2-5. The CU design for Area 3B is depicted on Figure 2-6 and the sample locations
30 are shown on Figures 2-7 and 2-8. As discussed in Section 2.1 of this document, the five primary
31 ASCOCs (total uranium, radium-226, radium-228, thorium 228, and thorium-232) will be retained in each
32 CU. Additional secondary and ecological COCs are identified for specific CUs within the certification
33 area as well as unique COCs for HWMUs and USTs.

1 Many factors were taken into consideration when determining the boundaries for each CU within Area 3A
2 and Area 3B. These factors include: areas defined as high leachability zones, historical land use, proximity
3 to other areas of the site, residual COC data, and previous existence of USTs and HWMUs. Additionally,
4 since Area 3A and Area 3B fall within the FPA, both areas are considered to be impacted areas, and
5 therefore were comprised of Group 1 CUs to allow for more concentrated sampling and ensure excavation
6 activities had no effect on the soil.

7
8 Ditches were constructed surrounding each area to prevent the run-on of water that has come in contact
9 with contaminated surfaces. Narrow CUs were designed as buffer CUs on the interior of these run-on
10 ditches to concentrate sampling around the perimeter of the areas.

11 12 2.2.1.1 Area 3A Certification Unit Design

13 The certification design and sampling strategy follow Section 3.4 of the SEP. Area 3A consists of
14 20 Group 1 CUs. Two of the CUs (CU 19 and CU 20) were established because of UST removal. One
15 CU was added for the footprint of each UST that was removed from Area 3A and to concentrate sampling
16 around the former process structures such as the Incinerator Pad, Maintenance Building, and Plant 9. The
17 Area 3A certification area (Figure 2-1) consists of the following:

- 18
19 • CU 1 through CU 4 Group 1 buffer CUs along the perimeter of the storm water run-on/run-off
20 control ditches
21 **Note:** CU 1 goes through the Maintenance Building RCRA Area
- 22 • CU 5 and CU 6 Group 1 CUs around the former Incinerator Pad
23 **Note:** CU 2 and CU 4 are entirely within the uranium high leachability area
- 24 • CU 7 Group 1 CU entirely within the uranium high leachability area
- 25 • CU 8 Group 1 CU surrounding the former Boiler Plant
- 26 • CU 9 through CU 14 Group 1 CUs in general area of Area 3A
- 27 • CU 15 Group 1 CU surrounding the Maintenance Building polychlorinated
28 biphenyl (PCB) area
- 29 • CU 16 Group 1 CU in general area of Area 3A
- 30 • CU 17 and CU 18 Group 1 CUs in former Plant 9
31 **Note:** These CUs are entirely within the uranium high leachability area
- 32 • CU 19 UST #3 CU
- 33 • CU 20 Discovered UST CU
34 **Note:** This CU is entirely within the uranium high leachability area
35
36

37 Due to the presence of the two USTs (UST #3 and a discovered UST) in Area 3A, the certification effort
38 includes the demonstration of soil FRL attainment and UST closure. Per Section 2.2.5 of the SEP:
39

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- 1 • Each UST footprint will form a distinct CU
- 2
- 3 • At least eight samples will be collected from the excavated base and sidewalls for each UST
- 4
- 5 • Samples will be analyzed for the COCs identified for each particular UST in Table 2-2 of the SEP.
- 6 If the UST was discovered during remediation, the samples will be analyzed for the COCs that
- 7 were defined following discovery.
- 8

9 2.2.1.2 Area 3B Certification Unit Design

10 The design of the CUs in Area 3B is more complex than that of Area 3A. As described in the
11 Implementation Plan for Area 3B/4B/5 (DOE 2004c), Area 3B was designed with two distinct excavation
12 grades. The first and uppermost grade was termed "contamination grade" and was designed to capture the
13 entirety of the soil contamination. The second and lower grade was termed the "design grade" where the
14 excavation was only designed to capture man-made structures. All soil beneath the contamination grade
15 was considered to be "certifiable" and therefore was not planned to be sent to the OSDF as impacted/
16 contaminated material. During the excavation, grading of the area was minimized, however, in order to
17 protect the area from contaminated surface water run-on, the perimeter run-on control ditches were
18 constructed immediately. The soil that was removed while constructing the ditches surrounding Area 3B
19 was from soil below the contamination grade, which is considered certifiable. This soil was not sent to the
20 OSDF. In turn, it was placed on the inside of the ditch line so that it could be certified with the rest of the
21 area. This soil was confined to small areas near the west ditch line, the southwest ditch line, and the east
22 ditch line as depicted on Figure 2-6. These collections of sub-grade soil will be certified as individual CUs
23 that are stratified above the plane of surface certification. Sampling of these piles will be performed at the
24 same locations as identified for the general area CUs but will be collected from varying depths. The
25 highest pile is approximately 4.5 feet high.

26

27 In the footprints of the areas that the sub-grade soil occupies, sampling was conducted through the pile and
28 a core was obtained at the surface that existed prior to the placement of the ditch soil. Since the sub-grade
29 soil piles only occupy portions of the underlying surface CUs, all samples taken of the pre-existing surface
30 through the pile were associated with the respective general CU. For example, the eastern ditch line pile
31 occupies an area that covers sections of CU 2, CU 10, and CU 12. Therefore, at location A3B-C10-13,
32 samples were collected from the pile as well as from the footprint of the pile. The sample of the soil from
33 the pile was included with the statistics of Soil Pile #2 CU and the sample collected from the footprint was
34 treated as a sample from CU 10.

35

1 Additionally, for vehicle access to the various areas of 3B that were isolated by deep trench excavations,
2 certain discrete areas were "bridged" with this same soil. The soil in these isolated bridge areas was
3 sampled and included with the statistics of the CU that they are in. The affected CUs and their respective
4 sample locations are as follows: CU 9 - sample locations 1 and 3, CU 11 - sample locations 8 and 10,
5 CU 2 - sample location 14. These samples are in addition to the 16 routine sample locations per CU;
6 therefore, these CUs have more than the typical number of samples for certification statistics.

7
8 Due to the presence of a HWMU (HWMU #20) in Area 3B, this certification includes the demonstration
9 of soil FRL attainment and HWMU closure. Per Section 2.2.5 of the SEP:

- 10 • Each HWMU footprint will form a distinct CU
- 11 • At least eight samples will be collected from the excavated base and sidewalls for each HWMU
- 12 • Samples will be analyzed for the COCs identified for each particular HWMU in Table 2-1 of the
13 SEP. If the HWMU was discovered during remediation, the samples will be analyzed for the
14 COCs that were defined following discovery.

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19 The size of HWMU #20 encompasses most of Area 3B, therefore all 12 Group 1 CUs established in
20 Area 3B and the three soil pile CUs were sampled for the ASCOCs as well as the COCs identified
21 specifically for HWMU #20. However, the certification area for 3B did not fully encompass the lateral
22 extent of HWMU #20. Four additional samples were placed outside of the Area 3B certification boundary
23 yet within the HWMU boundary to provide full coverage of the HWMU and to satisfy HWMU closure.
24 Figure 2-8 depicts these additional sample locations. The Area 3B certification area as shown on
25 Figure 2-6, consists of the following:

- 26 • CU 1 through CU 4 Group 1 buffer CUs along the perimeter of the storm water run-on/run-off
27 control ditches
28 **Note:** CU 1 is entirely within the uranium high leachability area
- 29 • CU 5 Group 1 CU in general area of Area 3B
- 30 • CU 6 and CU 7 Group 1 CUs entirely within uranium high leachability area
- 31 • CU 8 Group 1 CU in general area of Area 3B
- 32 • CU 9 Group 1 CU entirely within uranium high leachability area
- 33 • CU 10 through CU 12 Group 1 CUs in general area of Area 3B
- 34 • Soil Pile #1 CU Group 1 CU along the western side of Area 3B
- 35 • Soil Pile #2 CU Group 1 CU along the eastern side of Area 3B
- 36 • Soil Pile #3 CU Group 1 CU along the southern side of Area 3B

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1 2.2.2 Sample Selection Process

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

8
9 As discussed in Section 2 of the CDL, several breaches of the Great Miami Aquifer (GMA) occurred in
10 Area 3A. During the excavation and backfill process, samples were collected from either the exposed
11 sand/soil or the clay plugs in accordance with Section 3.5 of the Implementation Plan for Area 3A/4A
12 (DOE 2001). These samples were analyzed and validated consistent with the certification protocols. Each
13 location was factored into the certification sample selection and the results were included with their
14 respective CU during the statistical analysis. For the footprint of the former boiler plant, CU 8 contains
15 these previously collected samples: 3ADBPSM-1, 3ABPFGOR-1, 3ABPFGOR-2, 3ABPFGOR-3, and
16 3ABPFGOR-4, which are identified on Figure 2-2. For the deep excavation in Plant 9, CU 18 contains
17 these previously collected samples: 3ALTCP9C-1 and 3ALTCP9C-2, which are identified on Figure 2-3.

18
19 All Area 3A sub-CUs and planned certification sampling locations are shown on Figures 2-1 through 2-5
20 and the Area 3B sub-CUs and planned certification sampling locations are shown on Figures 2-6
21 through 2-8. Four of the 16 sample locations (one location from each quadrant of the CU) were designated
22 with a "V," indicating archive sample locations. One sample location in the CU was designated with a
23 "D," indicating a field duplicate sample collection location. Sample location A3A-C18-8 has been biased
24 towards the hotspot identified during precertification scanning in Area 3A, as discussed in Section 2.0 of
25 the CDL for Areas 3A and 3B.

26
27 2.2.3 Certification Sampling

28 Other than the soil pile CUs and the "bridged" locations listed in Section 2.2.1.2, samples were collected
29 for analysis from 0 to 6 inches at 12 of the 16 locations in each CU. The four samples designated as
30 "archive" were not collected as they were not needed for additional analysis

1 2.2.4 Statistical Analysis

2 Two criteria must be met for the CU to pass certification. If the data distribution is normal or lognormal, the
3 first criterion compares the 95 percent Upper Confidence Limit (UCL) on the mean of each primary COC to
4 its FRL, or the 90 percent UCL on the mean of each secondary ASCOC. On an individual CU basis, any
5 ASCOC with the 95 percent UCL (for primary ASCOCs) or 90 percent UCL (for secondary ASCOCs) above
6 the FRL results in that CU failing certification. If the data distribution is not normal or lognormal, the
7 appropriate nonparametric approach discussed in Appendix G of the SEP will be used to evaluate the second
8 criterion; the *a posteriori* test will be performed to determine whether the sample size is sufficient for a
9 meaningful conclusion of this comparison. The second criterion is the hotspot criterion, which states that
10 primary or secondary ASCOC results must not exceed two times the FRL. When the given UCL on the mean
11 for each COC is less than its FRL and the hotspot criterion is met, the CU will be considered certified.

12
13 In the event that a CU passes the *a posteriori* test but fails certification, the following two scenarios will be
14 evaluated: 1) localized contamination, and 2) widespread contamination. Details on the evaluation and
15 responses to these possible outcomes are provided in Section 3.4.5 of the SEP.

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**TABLE 2-1
 AREA 3 ASCOC LIST^a**

ASCOC	FRL/(BTV) ^b
Radionuclides	
Total Uranium	82 mg/kg
Total Uranium ^c	20 mg/kg
Radium-226	1.7 pCi/g
Radium-228	1.8 pCi/g
Thorium-228	1.7 pCi/g
Thorium-232	1.5 pCi/g
Technetium-99	30.0 pCi/g
Thorium-230	280 pCi/g
Cesium-137	1.4 pCi/g
Chemical	
Aroclor-1254	0.13 mg/kg
Aroclor-1260	0.13 mg/kg
Benzo(a)anthracene ^d	20.0 mg/kg (1.0 mg/kg)
Benzo(a)pyrene ^d	2.0 mg/kg (1.0 mg/kg)
Benzo(b)fluoranthene ^d	20.0 mg/kg (1.0 mg/kg)
Bromodichloromethane	4.0 mg/kg
Dibenzo(a,h)anthracene ^d	2.0 mg/kg (0.088 mg/kg)
1-1-Dichloroethene	0.41 mg/kg
Dieldrin	0.015 mg/kg
Fluoride	78,000 mg/kg
Indeno(1,2,3-cd)pyrene ^d	20 mg/kg (1.0 mg/kg)
Tetrachloroethene	3.6 mg/kg
Trichloroethene	25.0 mg/kg
Metals	
Arsenic	12.0 mg/kg
Beryllium	1.5 mg/kg
Lead	400 mg/kg
Ecological	
Antimony	96.0 mg/kg (10.0 mg/kg)
Cadmium	82.0 mg/kg (5.0 mg/kg)
Molybdenum	2900 mg/kg (10.0 mg/kg)
Silver	29,000 mg/kg (10.0 mg/kg)
Benzo(g,h,i)perylene	(1.0 mg/kg)
Benzo(k)fluoranthene	200 mg/kg (1.0 mg/kg)
Chrysene	2000 mg/kg (1.0 mg/kg)
Fluoranthene	(10.0 mg/kg)
Phenanthrene	(5.0 mg/kg)
Pyrene	(10.0 mg/kg)

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TABLE 2-1
AREA 3 ASCOC LIST^a
(Continued)

^a As listed in Table 2-7 of the SEP.

^b BTV applies to Ecological COCs

^c The total uranium FRL is lower in the defined high leachability zones

^d Secondary and Ecological COC

pCi/g - picoCuries per gram

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FCP-A3A3B-CERTRPT-DRAFT
 20803-RP-0003, Revision A
 December 2004

TABLE 2-2
 ASCOC LIST FOR AREA 3A

ASCOC	Retained as ASCOC?	Justification	CU(s)
Radionuclides			
Total Uranium	Yes	Primary Radionuclide	All ^a
Radium-226	Yes	Primary Radionuclide	All
Radium-228	Yes	Primary Radionuclide	All
Thorium-228	Yes	Primary Radionuclide	All
Thorium-232	Yes	Primary Radionuclide	All
Technetium-99	Yes	Above-FRL concentrations within Area 3A	All
Thorium-230	No	Not detected at concentrations above the FRL	None
Cesium-137	No	Not detected at concentrations above the FRL	None
Chemical			
Aroclor-1254	Yes	Above-FRL concentrations within Area 3A	1,2,5,6,15
Aroclor-1260	Yes	Above-FRL concentrations within Area 3A	1,2,5,6,15
Benzene	Yes	UST-3 specific COC	19
Benzo(a)anthracene ^b	Yes	Above-FRL concentrations within Area 3A and required per Appendix C of SEP	1,6,12,13,15,16
Benzo(a)pyrene ^b	Yes	Above-FRL concentrations within Area 3A and required per Appendix C of SEP	1,6,12,13,15,16
Benzo(b)fluoranthene ^b	Yes	Above-FRL concentrations within Area 3A and required per Appendix C of SEP	1,6,12,13,15,16
Bromodichloromethane	No	Not detected at concentrations above the FRL	None
Dibenzo(a,h)anthracene ^b	Yes	Above-FRL concentrations within Area 3A and required per Appendix C of SEP	1,6,12,13,15,16
1,1-Dichloroethene	Yes	Above-FRL concentrations within Area 3A	1,2,5,6
1,2-Dichloroethene	Yes	Above-FRL concentrations within Area 3A	1,2,5,6,15
Dieldrin	No	Not detected at concentrations above the FRL	None
Ethylbenzene	Yes	UST-3 specific COC	19
Fluoride	No	Not detected at concentrations above the FRL	None
Indeno(1,2,3-cd)pyrene ^b	Yes	Above-FRL concentrations within Area 3A and required per Appendix C of SEP	1,6,12,13,15,16
Tetrachloroethene	Yes	Above-FRL concentrations within Area 3A	1,2,5,6
Trichloroethene	Yes	Above-FRL concentrations within Area 3A	1,2,5,6
Toluene	Yes	UST-3 specific COC	19
Xylene	Yes	UST-3 specific COC	19
Metals			
Arsenic	Yes	Above-FRL concentrations within Area 3A	2,5,9
Barium	Yes	UST-3 specific COC	19
Beryllium	Yes	Above-FRL concentrations within Area 3A	2,5,6,9
Lead	Yes	UST-3 specific COC	6,19
Mercury	Yes	UST-3 specific COC	19

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TABLE 2-2
ASCOC LIST FOR AREA 3A
(Continued)

ASCOC	Retained as ASCOC?	Justification	CU(s)
Ecological			
Antimony	No	Not detected at concentrations above the FRL or the BTV.	None
Cadmium	Yes	Required per Appendix C of SEP.	All
Molybdenum	Yes	Required per Appendix C of SEP.	All
Silver	Yes	Required per Appendix C of SEP.	All
Benzo(g,h,i)perylene	Yes	Required per Appendix C of SEP.	1,6,12,13,15,16
Benzo(k)fluoranthene	Yes	Required per Appendix C of SEP.	1,6,12,13,15,16
Chrysene	Yes	Required per Appendix C of SEP.	1,6,12,13,15,16
Fluoranthene	Yes	Required per Appendix C of SEP.	1,6,12,13,15,16
Phenanthrene	Yes	Required per Appendix C of SEP.	1,6,12,13,15,16
Pyrene	Yes	Required per Appendix C of SEP.	1,6,12,13,15,16

4
5 ^a CUs 2, 4, 6, 7, 17, 18, and 20 fall in the high leachability zones where the uranium FRL = 20 mg/kg
6 ^b Secondary and Ecological COC.

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**TABLE 2-3
 ASCOC LIST FOR AREA 3B**

ASCOC	Retained as ASCOC?	Justification	CU(s)
Radionuclides			
Total Uranium	Yes	Primary Radionuclide	All ^a
Radium-226	Yes	Primary Radionuclide	All
Radium-228	Yes	Primary Radionuclide	All
Thorium-228	Yes	Primary Radionuclide	All
Thorium-232	Yes	Primary Radionuclide	All
Technetium-99	Yes	Above-FRL concentrations within Area 3B	All
Thorium-230	No	Not detected at concentrations above the FRL	None
Cesium-137	No	Not detected at concentrations above the FRL	None
Chemical			
Aroclor-1254	No	Not detected at concentrations above the FRL	None
Aroclor-1260	No	Not detected at concentrations above the FRL	None
Benzo(a)anthracene ^b	No	Not detected at concentrations above the FRL	None
Benzo(a)pyrene ^b	No	Not detected at concentrations above the FRL	None
Benzo(b)fluoranthene ^b	No	Not detected at concentrations above the FRL	None
Bromodichloromethane	No	Not detected at concentrations above the FRL	None
Dibenzo(a,h)anthracene ^b	No	Not detected at concentrations above the FRL	None
1,1-Dichloroethene	No	Not detected at concentrations above the FRL	None
Dieldrin	No	Not detected at concentrations above the FRL	None
Fluoride	No	Not detected at concentrations above the FRL	None
Indeno(1,2,3-cd)pyrene ^b	No	Not detected at concentrations above the FRL	None
Methylene Chloride	Yes	HWMU-20 specific COC	All
Tetrachloroethene	Yes	HWMU-20 specific COC	All
1,1,1-Trichloroethane ^c	Yes	HWMU-20 specific COC	All
Trichloroethene	No	Not detected at concentrations above the FRL	None
Xylenes	Yes	HWMU-20 specific COC	All
Metals			
Arsenic	No	Not detected at concentrations above the FRL	None
Barium	Yes	HWMU-20 specific COC	All
Beryllium	No	Not detected at concentrations above the FRL	None
Lead	Yes	HWMU-20 specific COC	All
Ecological			
Antimony	Yes	Required per Appendix C of SEP.	All
Cadmium	Yes	Required per Appendix C of SEP.	All
Molybdenum	Yes	Required per Appendix C of SEP.	All
Silver	Yes	Required per Appendix C of SEP.	All
Benzo(g,h,i)perylene	No	Not detected at concentrations above the FRL	None
Benzo(k)fluoranthene	No	Not detected at concentrations above the FRL	None

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TABLE 2-3
ASCOC LIST FOR AREA 3B
(Continued)

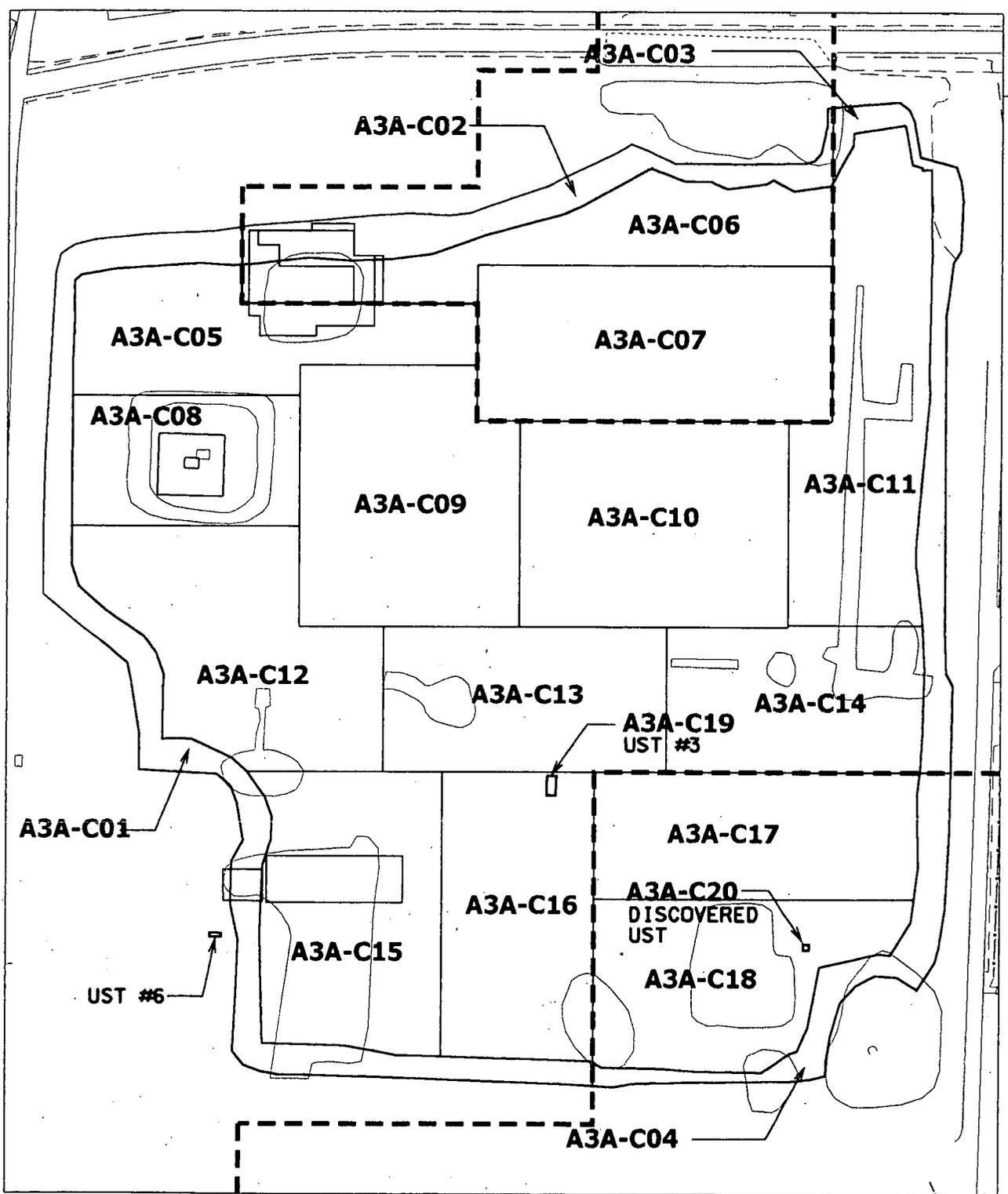
ASCOC	Retained as ASCOC?	Justification	CU(s)
Ecological (continued)			
Chrysene	No	Not detected at concentrations above the FRL	None
Fluoranthene	No	Not detected at concentrations above the FRL	None
Phenanthrene	No	Not detected at concentrations above the FRL	None
Pyrene	No	Not detected at concentrations above the FRL	None

^a CUs 1, 6, 7, and 9 fall in the high leachability zones where the uranium FRL = 20 mg/kg
^b Secondary and Ecological COC
^c FRL is actually for 1,1,2-trichloroethane since 1,1,1-trichloroethane does not have a FRL.

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LEGEND:

--- HIGH LEACHATE ZONE

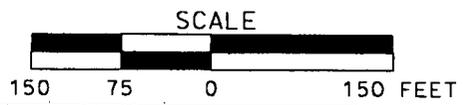
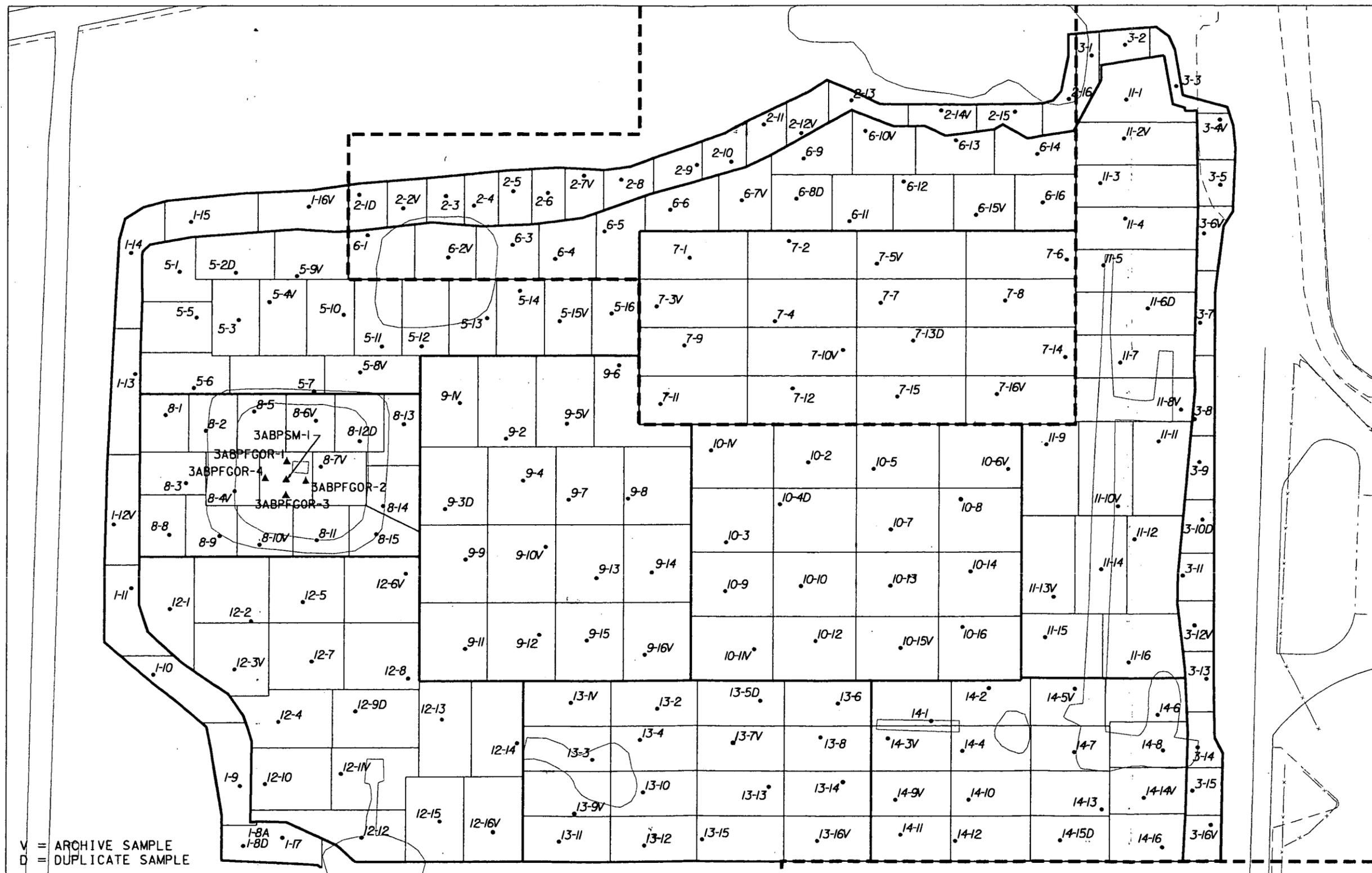


FIGURE 2-1. AREA 3A CU BOUNDARY MAP



V = ARCHIVE SAMPLE
 D = DUPLICATE SAMPLE

LEGEND:

- CU BOUNDARY
- - - HIGH LEACHATE ZONE
- 14-10 SAMPLE LOCATION
- ▲ PREVIOUSLY COLLECTED SAMPLE

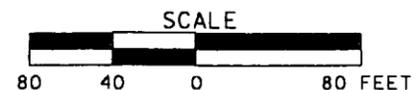
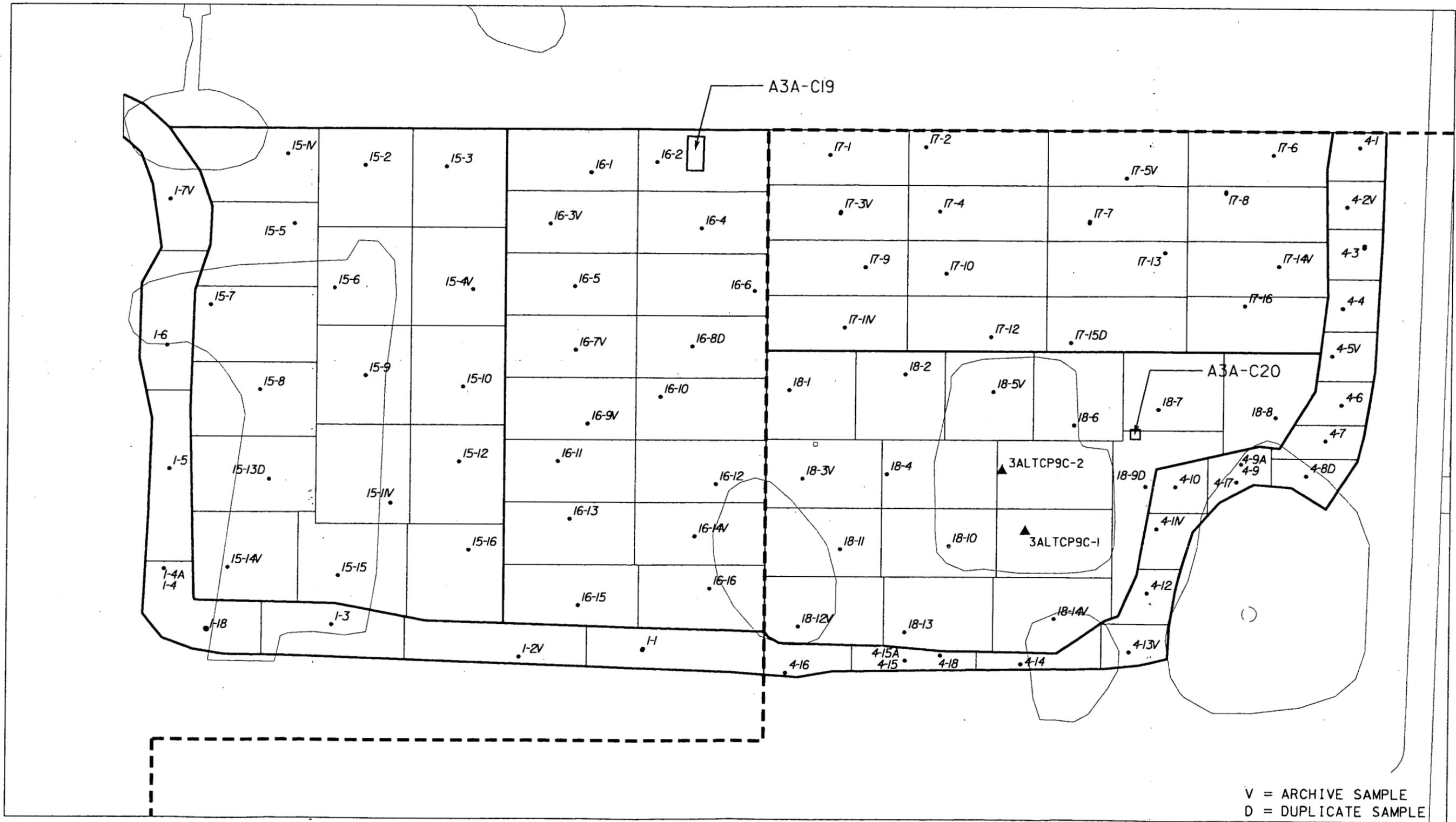


FIGURE 2-2. AREA 3A NORTH SUB-CU BOUNDARY AND CERTIFICATION SAMPLING LOCATIONS



V = ARCHIVE SAMPLE
 D = DUPLICATE SAMPLE

LEGEND:

- CU BOUNDARY
- - - HIGH LEACHATE ZONE
- 18-4 SAMPLE LOCATION
- ▲ PREVIOUSLY COLLECTED SAMPLE

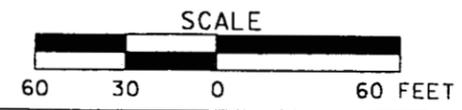
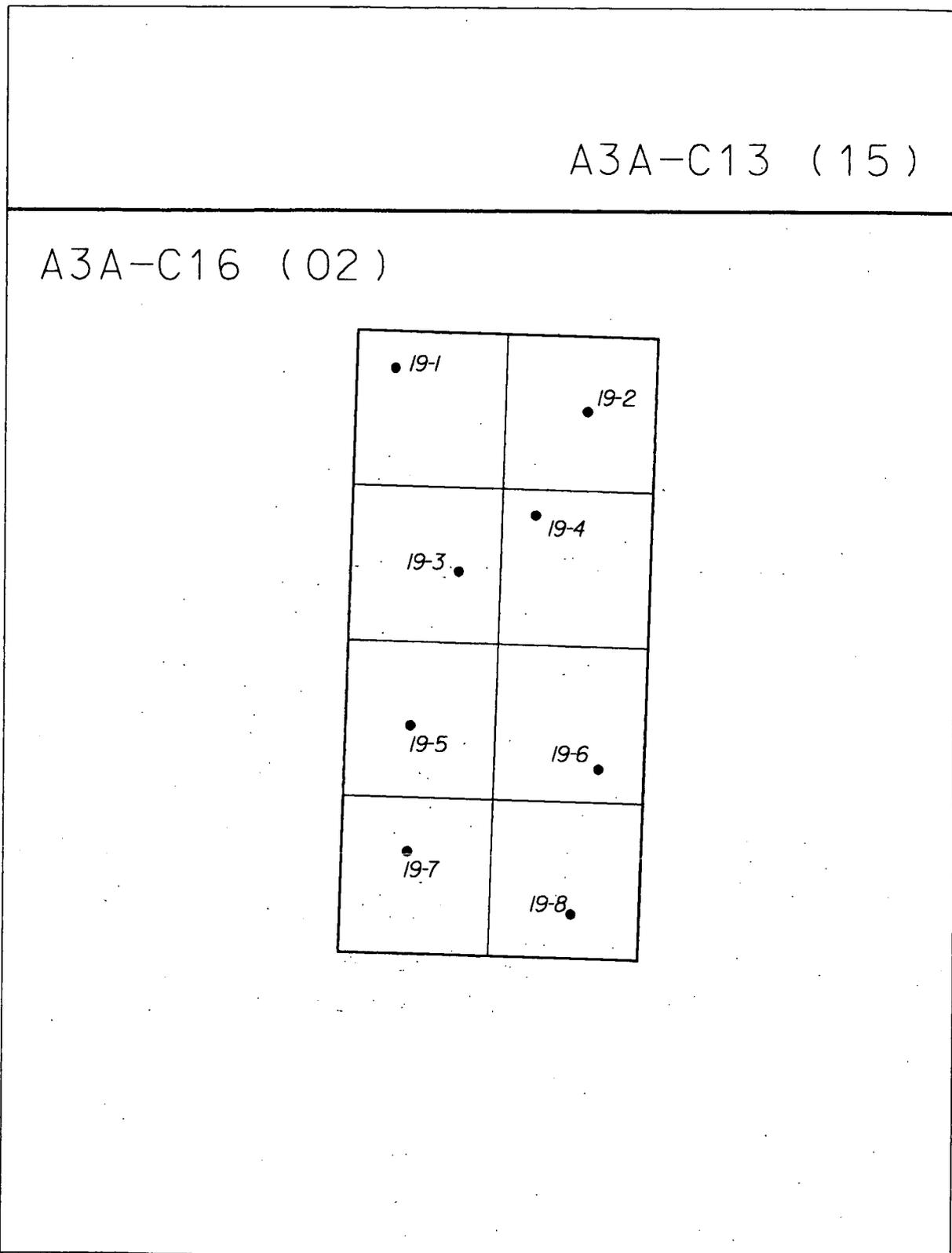


FIGURE 2-3. AREA 3A SOUTH SUB-CU BOUNDARY AND CERTIFICATION SAMPLING LOCATIONS

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LEGEND:

● 19-5
 SAMPLE LOCATION

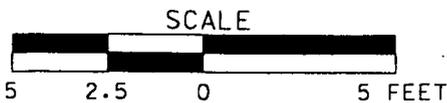
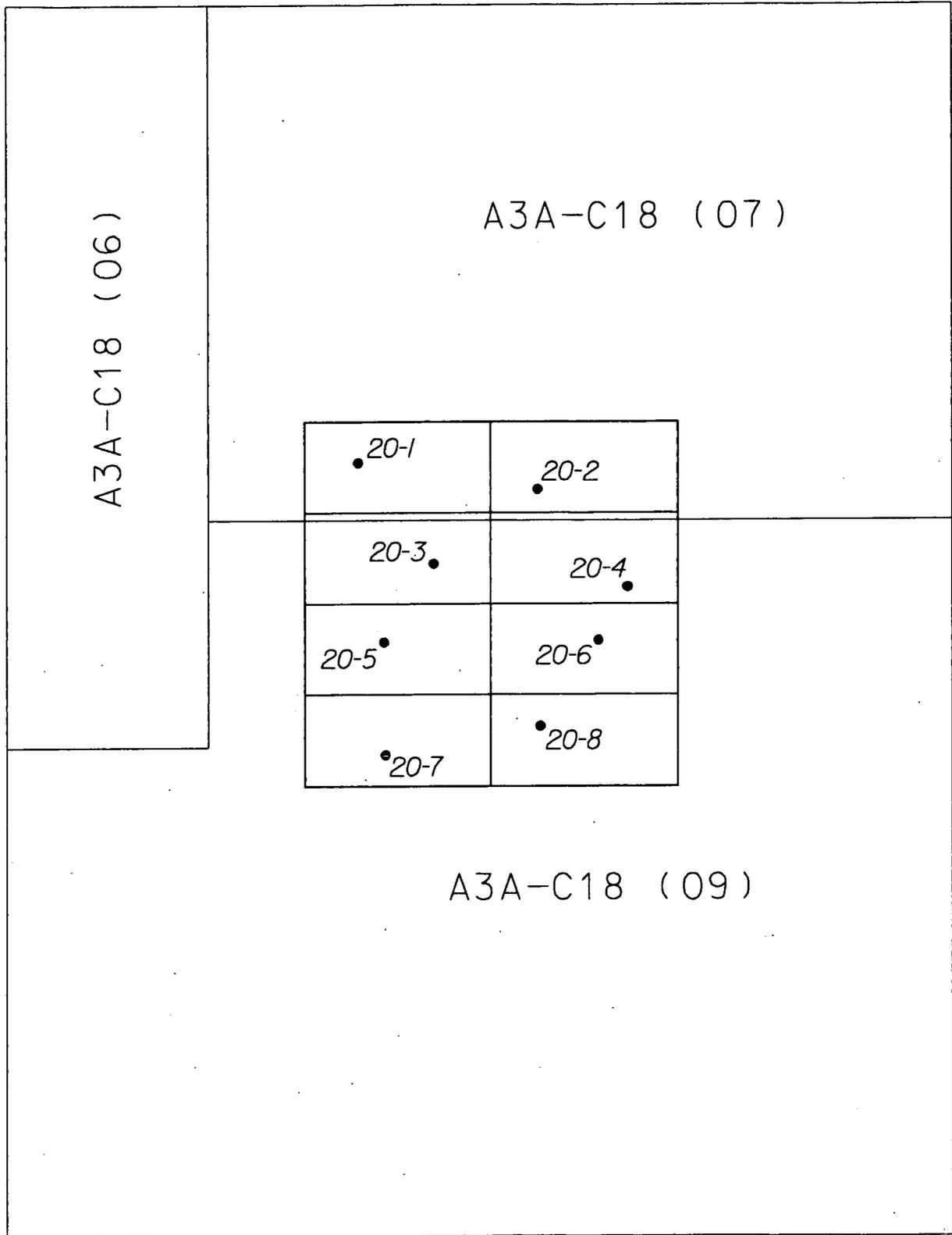


FIGURE 2-4. AREA 3A UST #3 SUB-CU BOUNDARY AND CERTIFICATION SAMPLING LOCATIONS



LEGEND:

● 20-7
SAMPLE LOCATION

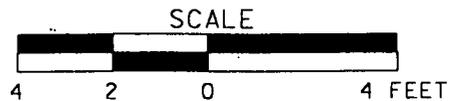
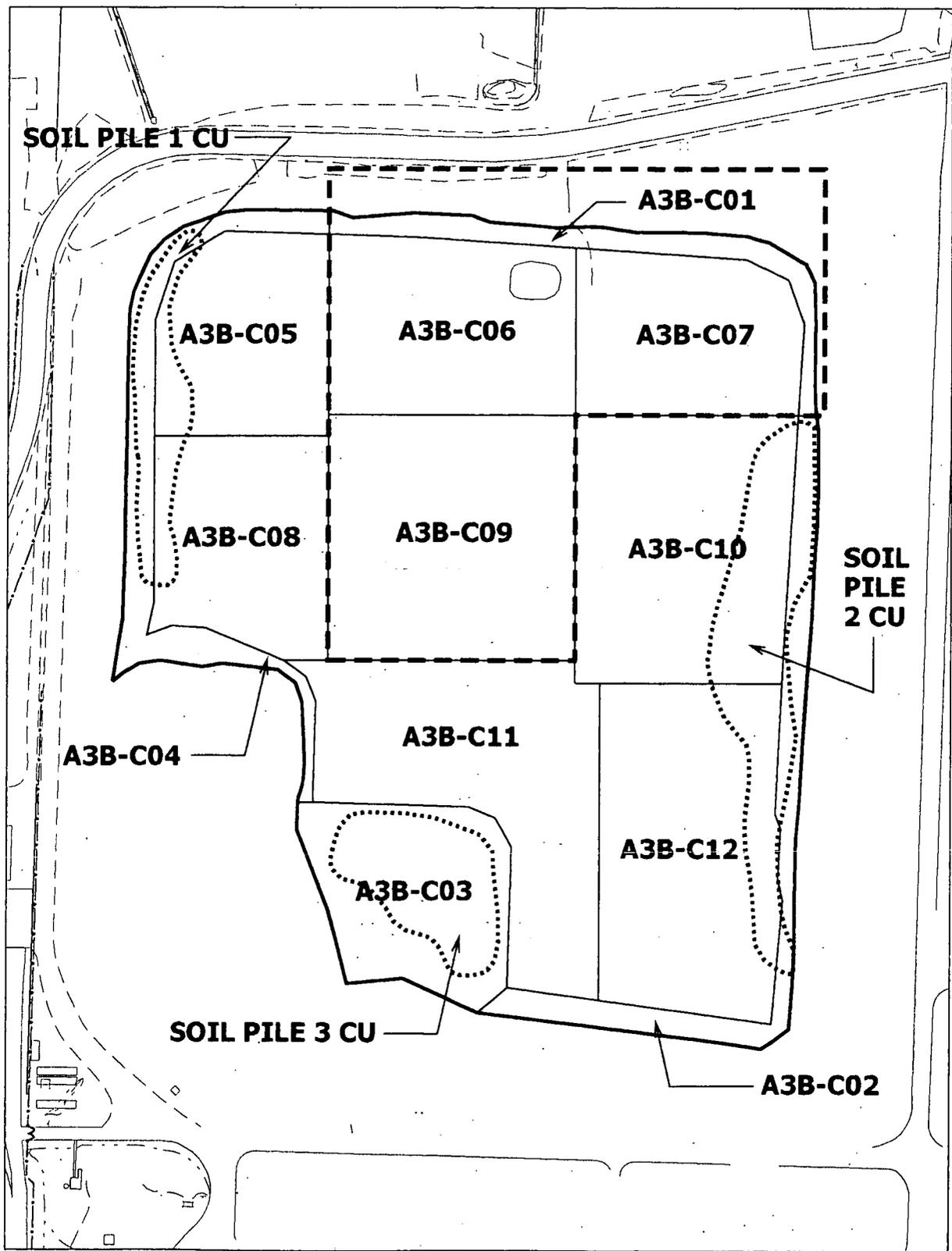


FIGURE 2-5. AREA 3A DISCOVERED UST SUB-CU BOUNDARY AND CERTIFICATION SAMPLING LOCATIONS

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LEGEND:

- HIGH LEACHATE ZONE
- PILE BOUNDARIES

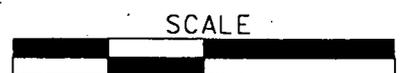
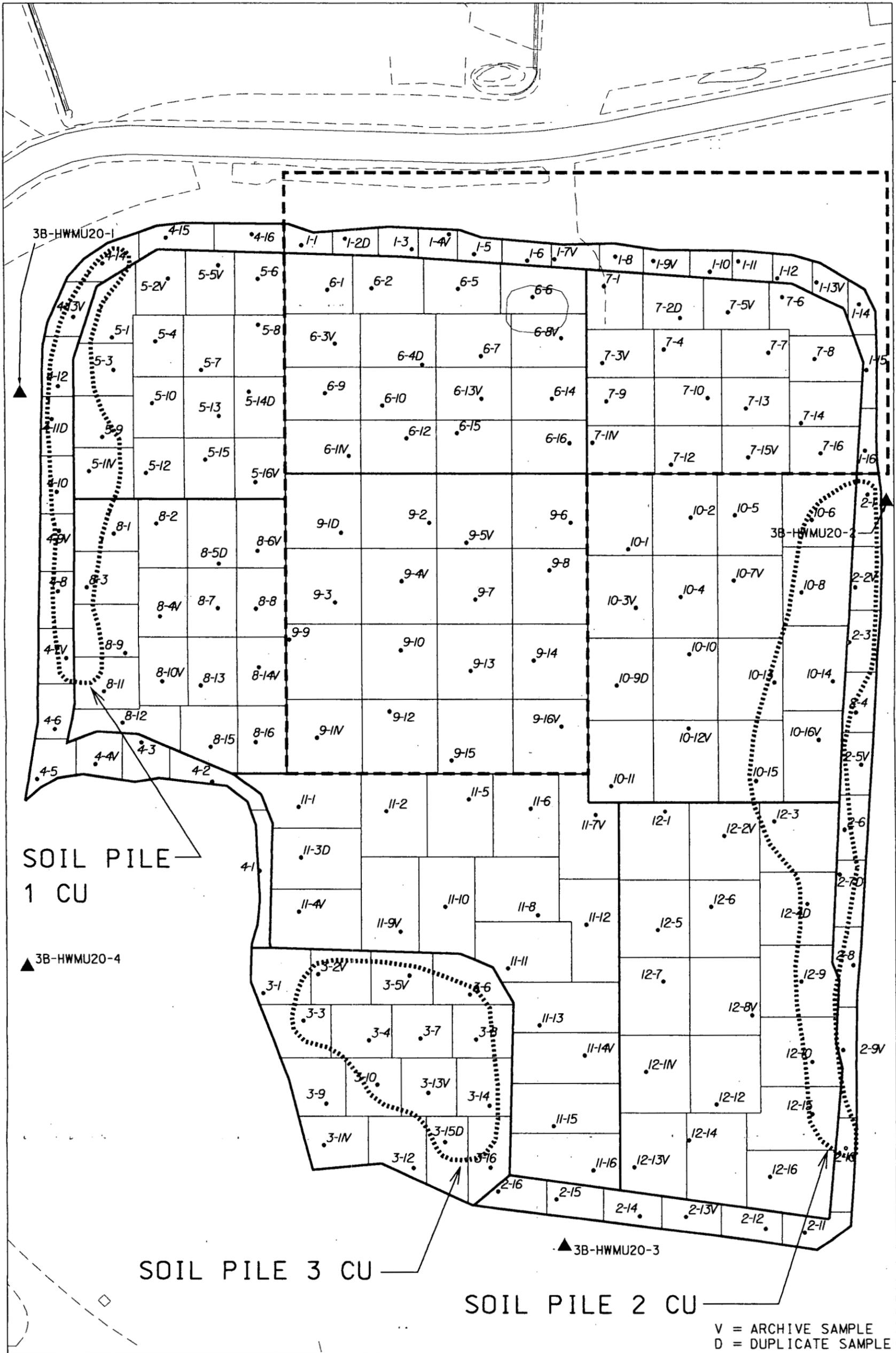


FIGURE 2-6. AREA 3B CU BOUNDARY MAP

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SOIL PILE 1 CU

SOIL PILE 3 CU

SOIL PILE 2 CU

V = ARCHIVE SAMPLE
D = DUPLICATE SAMPLE

LEGEND:

- CU BOUNDARY
- - - HIGH LEACHATE ZONE

- 11-15 SAMPLE LOCATION
- ▲ HWMU SAMPLE LOC.
- PILE BOUNDARY

- 11-15 SAMPLE LOCATION
- ▲ HWMU SAMPLE LOC.
- PILE BOUNDARY

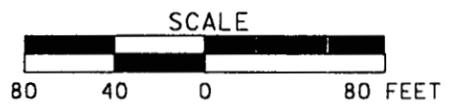


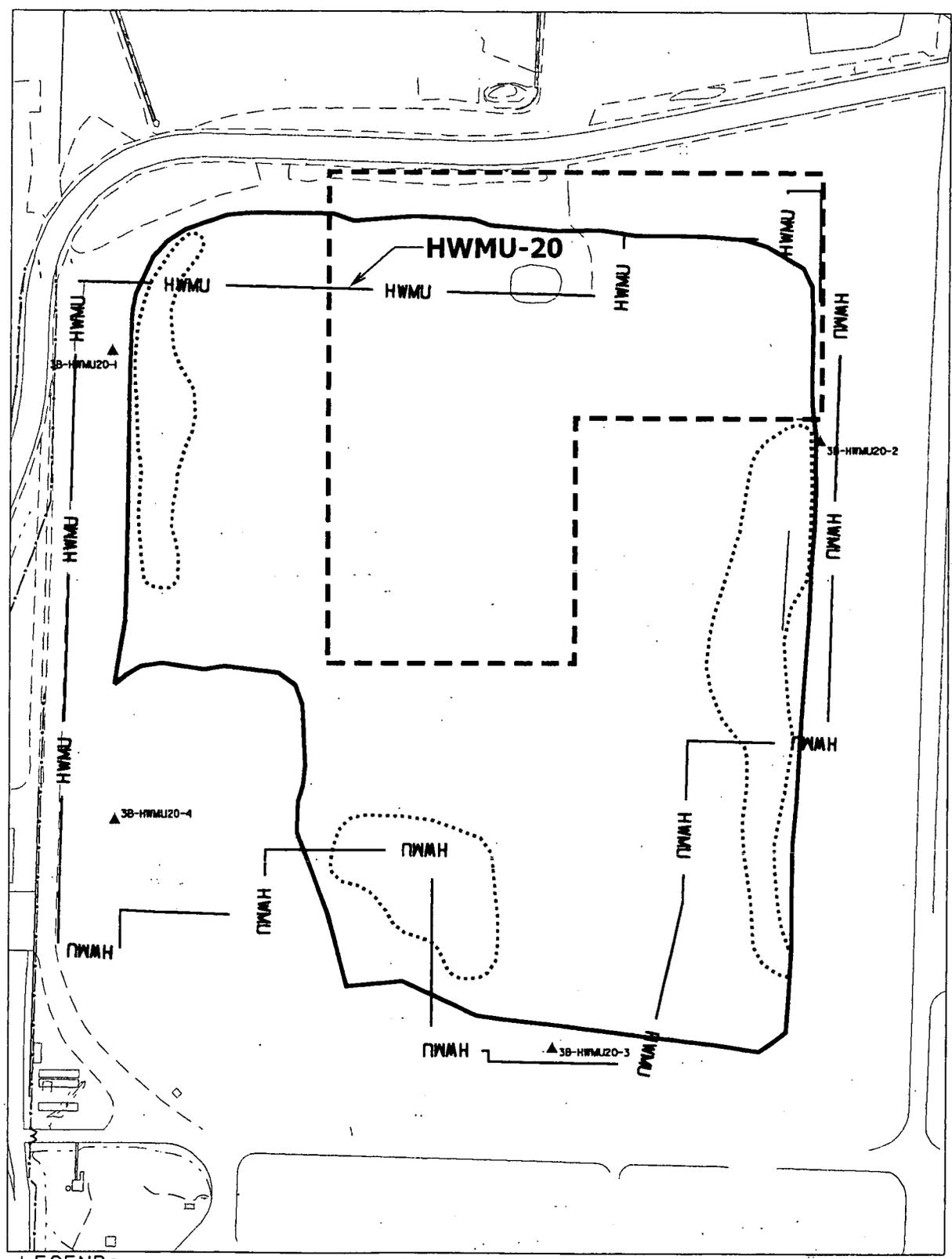
FIGURE 2-7. AREA 3B SUB-CU BOUNDARY AND CERTIFICATION SAMPLING LOCATIONS

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STATE PLANAR COORDINATE SYSTEM 1983

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LEGEND:

- ▲ HWMU SAMPLE LOCATION
- AREA 3B BOUNDARY
- - - HWMU - HWMU-20 BOUNDARY
- - - - - HIGH LEACHATE ZONE

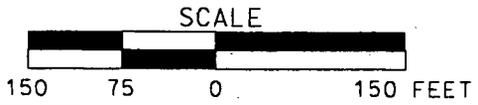


FIGURE 2-8. AREA 3B ADDITIONAL HWMU CLOSURE SAMPLES OUTSIDE CERTIFICATION AREA BOUNDARY

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3.0 OVERVIEW OF FIELD ACTIVITIES

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

In addition to the Predesign Investigations, the OU3 and OU5 RI Reports (DOE 1995c and 1995a) and Feasibility Study Reports (FS, DOE 1995d and 1995e) were used for remedial design of Area 3A and Area 3B. Final grade excavation monitoring/sampling and real-time scanning/sampling data have been collected pursuant to the RI/FS and remedial activities.

Before initiating the certification process, all historical soil data within the Area 3A and Area 3B certification areas were pulled from the Sitewide Environmental Database (SED). The data for Area 3A is summarized in Section 3.1.1 and Area 3B is summarized in Section 3.1.2.

Based on the results of sampling and scanning activities summarized in Sections 3.1 and 3.2, it has been determined that no further remedial actions are necessary to remove above-FRL or above-WAC soil.

3.1 AREA PREPARATION AND PRECERTIFICATION

3.1.1 Area 3A

All historical data for Area 3A are summarized in the Area 3A/4A Implementation Plan. This includes RI/FS and predesign data. Data were also collected during the remediation/excavation activities for excavation control and following the remediation/excavation activities for precertification per the PSP for Area 3A/4A Excavation Characterization and Precertification (DOE 2002b). Additional information on the latter will be discussed in the following paragraphs.

Below is a brief discussion of the remediation/excavation and precertification activities in Area 3A that follow this order: above-WAC areas, RCRA areas, USTs, excavation areas not driven by contamination, breaching the sand lens of the GMA, and the precertification.

The designed above-WAC Areas in Area 3A were in the Incinerator Pad and Plant 9. Both areas were above-WAC for total uranium and technetium-99. All of the above-WAC material was removed during the remediation/excavation activities in Area 3A. During remediation/excavation activities in Area 3A the

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1 above-WAC area in Plant 9 was expanded laterally and vertically due to the presence of visible product
2 material. Additional excavation was performed until all of the product material was removed. Once all of
3 the above-WAC material was removed from these areas, the excavation proceeded to remove the
4 remaining above-FRL material.

5
6 The one RCRA Area in Area 3A was located north of the Maintenance Building and had hazardous levels
7 of trichloroethene. This is discussed in detail in the Area 3A/4A Implementation Plan. The area was
8 remediated/excavated in the winter of 2001 and 2002.

9
10 The footprints of two USTs in Area 3A are being closed under this certification process, UST #3 and a
11 discovered UST in the Plant 9 area. UST #3 was located 25 feet northeast of the Railroad Engine
12 House (24B). Additional information about the UST #3 can be found in Section 2 of the SEP and
13 Section 4 of the CDL. The UST in Plant 9 was discovered in November 2002 and was within an area that
14 is approximately 100 square feet. It was filled with mortar, but there was an odor emitted and black sludge
15 like material was found around the area of the UST. Sampling was performed around the area under the
16 Area 3A/4A Excavation Characterization and Precertification PSP and it was determined that the UST and
17 the 10-foot by 10-foot area surrounding the UST did not contain above-FRL radiological or organic
18 material. Additional information about the COCs for the closure of the discovered UST is discussed in
19 Section 2.

20
21 Excavation activities in the Boiler Plant were driven by the removal of structural features and not for
22 contamination, however excavations came within 5 feet of the sands and gravels of the GMA. Excavation
23 in Plant 9 also came within 5 feet of the sands and gravels of the GMA. Prior to backfilling the area
24 sampling was performed per the Area 3A/4A Excavation Characterization and Precertification PSP.
25 Further discussion on sampling of these areas is located in Section 2.2.2.

26
27 The final above-WAC soil volume removed from Area 3A was 19,701 (bank) cubic yards (yd³). The final
28 above-FRL soil volume removed from Area 3A was 251,195 (bank) yd³.

29
30 Following the excavation activities in Area 3A, precertification activities were conducted according to the
31 guidelines established in Section 3.3.3 of the SEP to evaluate residual radiological contamination patterns
32 as specified in the Area 3A/4A Excavation Characterization and Precertification PSP. Prior to conducting
33 a precertification real-time scan, Area 3A was scanned with a magnetometer to determine if residual debris

1 remained following excavation activities. Minor occurrences of metallic objects were located and were
2 either excavated or hand picked from the area.

3
4 During Phase 1 of Precertification Activities a hotspot for total uranium was detected greater than three
5 times the FRL (20 mg/kg) in the southeast portion of Area 3A. This hotspot was delineated and the area
6 was excavated. Following this excavation, Phase 3 Precertification Activities were performed to confirm
7 that the excavation removed the contamination, but there were locations that still exceeded greater than
8 three times the FRL. Again, this area was delineated and excavated. Following the second excavation,
9 Phase 3 Precertification Activities were performed again and there were locations that still exceeded
10 greater than three times the FRL. This area was delineated and excavated for a third time. Following the
11 third excavation, Phase 3 Precertification Activities were performed and the area passed the
12 precertification requirements.

13
14 With the successful removal of the hotspot, all areas in Area 3A passed the requirements of
15 precertification, and it was determined that certification of the soil in Area 3A could be completed.

16 17 3.1.2 Area 3B

18 All historical data for Area 3B are summarized in the Area 3B/4B/5 Implementation Plan. This includes
19 RI/FS and predesign data. Data were also collected during excavation control sampling of the area per
20 Area 3A/4A Excavation Characterization and Precertification PSP, and PSP for Excavation Control of
21 Areas 3B, 4B, and 5 (DOE 2004d).

22
23 The following above-WAC Areas were defined in the Area 3B/4B/5 Implementation Plan and removed
24 during excavation of Area 3B: Plant 1 Pad - Northwest (part of HWMU #20), Plant 1 Pad - North Central,
25 Plant 1 Pad - TS 4 (part of HWMU #20), and Plant 1 Pad - Southwest (part of HWMU #20). During
26 remediation/excavation activities in Area 3B, additional excavation control sampling was performed to
27 ensure that all visible product material was removed. These activities have been documented with V/FCNs
28 to the Area 3A/4A Excavation Characterization and Precertification PSP as well as PSP for Excavation
29 Control of Areas 3B, 4B, and 5.

30
31 The former Plant 1 Storage Pad was defined as a HWMU (HWMU #20) because it was an active outdoor
32 and indoor container storage area.

1 Excavation of Area 3B began in July 2003 with the removal of railroad tracks along the eastern side of the
2 area. The majority of the excavation took place within Plant 1 Pad footprint area. Excavation continued
3 into Building 71 footprint, Chemical Warehouse, Plant 1 Storage Building, and Plant 1 Ore Silos. Once
4 the major structures were removed and the above-WAC areas cleared, excavation continued to the depth of
5 the modeled uranium contamination grade.

6
7 The final above-WAC soil volume removed from Area 3B was 2,531 (bank) yd³. The final above-FRL
8 soil volume removed from Area 3B was 193,584 (bank) yd³.

9
10 Following the excavation activities in Area 3B, precertification activities were conducted according to the
11 guidelines established in Section 3.3.3 of the SEP to evaluate residual radiological contamination patterns.
12 Prior to conducting a precertification real-time scan, Area 3B was scanned with a magnetometer to
13 determine if residual debris remained following excavation activities. Minor occurrences of metallic
14 objects were located and either excavated or hand picked from the area.

15
16 All areas in 3B passed the requirements of precertification, and it was determined that certification of the
17 soil in Area 3B could be completed.

18 19 3.2 CHANGES TO SCOPE OF WORK

20 The scope of work for Area 3A and Area 3B Certification Sampling required three changes, which were
21 documented with V/FCNs and are discussed in the following paragraphs.

22
23 The first V/FCN written for this project, 20803-PSP-0002-01, was disapproved. Due to this disapproval,
24 the V/FCN was cancelled and did not affect the scope of this work.

25
26 The first change to the scope of this work modified the contracted laboratory's turnaround time
27 requirements for the organic and inorganic analysis from 30 days to 21 days. This V/FCN,
28 20803-PSP-0002-02, is included in Appendix C.

29
30 CU 4 in Area 3A failed for total uranium with the UCL on the mean being greater than the FRL. There
31 were only two individual samples that were greater than the FRL. Therefore, these two areas were
32 excavated to remove the contamination. Following the excavation, it was necessary to collect additional
33 samples from these two locations as well as from a random location within each of the two affected

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1 sub-CUs to demonstrate that the remainder of the sub-CU was adequately represented. This change in
2 work was documented in V/FCN 20803-PSP-0002-03, which is included in Appendix C, and is further
3 discussed in Section 5.

4
5 CU 1 in Area 3A failed for aroclor-1254 with the UCL on the mean being greater than the FRL. There
6 was only one individual sample that was greater than the FRL, however the variability and distribution of
7 the data resulted in a large standard deviation. Therefore, the two areas with the highest results were
8 excavated in order to reduce variability. Following the excavation, it was necessary to collect additional
9 samples from these two locations as well as from a random location within each of the two affected sub-
10 CUs to demonstrate that the remainder of the sub-CU was adequately represented. This change in work
11 was documented in V/FCN 20803-PSP-0002-04, which is included in Appendix C, and is further
12 discussed in Section 5.

4.0 ANALYTICAL METHODOLOGIES, DATA VALIDATION PROCESSES, AND DATA REDUCTION

4.1 ANALYTICAL METHODOLOGIES

All samples collected were sent off site for analysis. The laboratories complied with Sitewide Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ) requirements (DOE 2002c). The SCQ is the source for analytical methodologies (Appendix G), data verification and validation, and analytical quality assurance/quality control requirements.

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

4.1.1 Chemical Methods

Metals

Samples submitted for cadmium, molybdenum, silver, and beryllium analysis were analyzed by inductively coupled plasma-mass spectrometry (ICP-MS).

Samples submitted for arsenic, barium, lead, and antimony were analyzed by inductively coupled plasma-atomic emission spectroscopy (ICP-AES).

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

Polyaromatic Hydrocarbons (PAHs)

Samples submitted for PAH analyses were analyzed by gas chromatography/mass spectrometry (GC/MS).

Polychlorinated Biphenyl (PCBs)

Samples submitted for PCB analyses were analyzed by GC.

1 Volatile Organic Compounds (VOCs)

2 Samples submitted for VOC analyses were analyzed by GC/MS.

4 4.1.2 Radiochemical Methods

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

11 Total Uranium

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

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

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

19 Radium-226

20 Samples were analyzed by gamma spectrometry, and radium-226 was quantified by measuring gamma rays
21 emitted by members of its decay chain. This method does not require chemical separation, but the samples
22 must be allowed a 20-day progeny in-growth period before counting. The off-site laboratory used the same
23 gamma ray emission lines and error weighted average methodology to calculate all of the Area 3A and
24 Area 3B certification results.

26 Radium-228

27 Following gamma spectrometry analysis, radium-228 was also quantified by measuring gamma rays
28 emitted by members of its decay chain. The off-site laboratory used the same gamma ray emission lines
29 and error weighted average methodology to calculate all Area 3A and Area 3B certification results.

31 Isotopic Thorium

32 Isotopic thorium (thorium-228 and thorium-232) was also quantified by measuring gamma rays emitted by
33 members of its decay chain by gamma spectrometry. The off-site laboratory used the same gamma ray

1 emission lines and error weighted average methodology to calculate all Area 3A and Area 3B certification
2 results.

3 Thorium-230

4 Thorium-230 samples were analyzed by alpha spectroscopy to quantify the activity of thorium-230 that
5 decays by alpha emission. The alpha emission occurs at discrete energy levels that are characteristic of the
6 specific isotope and generally range from 3 to 8 million electron volts.

8 Technetium-99

9 Technetium-99 was quantified by using a liquid scintillation counter.

11 4.2 DATA VERIFICATION AND VALIDATION

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

17
18 Specific parameters associated with the data were evaluated during V&V to determine whether or not the
19 data quality objectives were met. Five principal Quality Assurance parameters (i.e., precision, accuracy,
20 completeness, comparability, and representativeness) were addressed during V&V. Field sampling and
21 handling, laboratory analysis and reporting, and non-conformances and discrepancies in the data were
22 examined to ensure compliance with appropriate and applicable procedures.

23

24 The V&V process evaluated the following parameters:

25

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

29

30 The data validation process examined the analytical data to determine the validation qualifier of the results.

31 General areas examined that apply to all the chemical data include the following:

32

- 33 • Holding Times
- 34 • Instrument calibrations
- 35 • Calculation of results
- 36 • Matrix spike/matrix spike duplicate recoveries

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- 1 • Laboratory/field duplicate precision
 - 2 • Field/Laboratory Blank contamination
 - 3 • Dry weight correction for solid samples
 - 4 • Correct detection limits reported
 - 5 • Laboratory control sample recoveries and compliance with established limits.

7 Parameters unique to the evaluation of radiochemical analyses include:

- 9 • Calibration data for specific energies
- 10 • Background checks
- 11 • Relative Error ratios
- 12 • Detector efficiencies
- 13 • Background count correction.

15 For this project, all the radiological data were reviewed and validated for all criteria noted above. Per
16 project requirements, a minimum of 10 percent of the certification data were validated to Level D. This
17 validation included the same review process as for Level B, but included a systematic review of the raw data
18 and recalculations. For Area 3A all of the analytical data from three CUs were validated to Level D, while
19 all remaining analytical data from the other 17 CUs were validated to Level B. For Area 3B all of the
20 analytical data from two CUs were validated to Level D, while all remaining analytical data from the other
21 13 CUs were validated to Level B.

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

- 26 - No qualification; the positive result or detection limit is confident as reported
- 28 J Positive result is estimated or imprecise; data point is usable for decision-making purposes.
29 Positive results less than the contract required reporting limit are also qualified in this manner
- 31 R Positive result or detection limit is considered unreliable; data point should not be used for
32 decision-making purposes
- 34 U Undetected result at the stated limit of detection
- 36 UJ Undetected result; detection limit is considered estimated or imprecise; the data point is usable
37 for decision-making purposes
- 39 N Positive result is tentatively identified - that is, there is some question regarding the actual
40 identification and quantification of the result. Compound reported is best professional
41 judgement of the interpretation of the supporting data, such as mass spectra. Caution must be
42 exercised with the use of these data

1 NV Not Validated. The results for this sample were not validated

2
3 Z This result, or detection limit in this analysis is not the best one to use; another analysis (e.g., the
4 dilution or re-analysis) contains a more confident and usable result.
5

6 The V&V of this data set did not identify any problems. All other results were either not qualified, qualified
7 as a redundant analysis (Z), or qualified as estimated (J) and/or non-detects (U). No results were qualified as
8 rejected (R).
9

10 4.3 DATA REDUCTION

11 Each sample used to support the Area 3A and Area 3B certification decision was entered in the SED with
12 the following information:
13

14 Field Information

- 15 • Sample Identification Number - A unique number assigned to each discrete sample point
- 16 • Coordinate Information - Northing and Easting locations.
17
18

19 Using the information as summarized above, the following actions were taken for data reduction of each
20 CU data set.
21

- 22 1. All of the data for each CU were queried from SED. All of the data were used even if the CU had
23 more than the minimum required data points.
24
- 25 2. The data from the validation fields were used for statistical calculations.
26
- 27 3. Data with a qualifier of R or Z was not used in the statistical calculations.
28
- 29 4. The higher of the two duplicate results was used in the statistical calculations.
30
- 31 5. One half on the non-detect (U or UJ) values were used in the statistical calculations.
32

33 Laboratory Information

34 For each sample result the following information is entered:
35

- 36 • Laboratory Result - The reported analytical value from the laboratory
37
- 38 • Laboratory Qualifier - The qualifier reported from the lab. For radiological parameters non-detect
39 values are assigned a U qualifier
40

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- 1 • Total Propagated Uncertainty (TPU) - The TPU is an estimate of the overall uncertainty associated
2 with a measured or calculated result that has been derived from an evaluation of all factors that can
3 influence a result, including both systematic and random sources of uncertainty. For both *in situ*
4 and laboratory-based radioactivity measurements, factors such as the random nature of the
5 radioactive decay process (i.e., counting uncertainty), the mass or volume of the "sample" being
6 analyzed, the variation in radiation detection efficiency with the energy of the emitted radiation
7 and the density and chemical composition of the sample, uncertainty in nuclear decay parameters
8 used to convert counts to activity, and attenuation of the radiation must be considered to properly
9 assess the overall uncertainty of the measured result.
- 10
- 11 • Units - The units in which the Laboratory Result is reported.
- 12

13 Validation Information

- 14
- 15 • Validation Result - The result based on the validation process. During the validation process,
16 sample results may be adjusted. If the laboratory result is less than the associated minimum
17 detectable concentration, the validation result becomes the minimum detectable concentration
18 value.
- 19
- 20 • Validation TPU - The TPU based on the validation process (applicable to radiological parameters
21 only). The data Validation Section evaluates the reported TPU as described in the SCQ in
22 Section 11.2 and Appendix D to assess the impact on the data quality and will qualify the data as
23 estimated if the uncertainty is excessive.
- 24
- 25 • Validation Qualifier - The qualifier assigned as a result of the data validation process.
- 26
- 27 • Validation Units - The units in which the Validation Result is reported.

1 **5.0 CERTIFICATION EVALUATION AND CONCLUSIONS**

2
3 Certification success or failure was based on sample data from each CU against criteria discussed in
4 Section 2.2.4. Subsequent to any evaluation of preliminary data, full statistical analysis and evaluation was
5 performed on all validated data. Final certification data are presented in Appendix B.
6

7 **5.1 CERTIFICATION RESULTS AND EVALUATION**

8 The following sections discuss the analytical results and statistical analyses of the data for each CU in
9 Area 3A and Area 3B.
10

11 **5.1.1 Area 3A**

12 **A3A-C01**

13 As discussed in Section 3.2, A3A-C01 required additional excavation to remove aroclor-1254 due to
14 failing the preliminary certification statistics, which are presented in Appendix A. The resample results
15 and associated statistical analyses performed after the additional excavation are discussed below.
16

17 Other than the aroclor-1254 issue, the remainder of the constituents for A3A-CU01 passed all certification
18 requirements. Therefore, the final certification data for those COCs are presented in Appendix B.
19

20 In A3A-C01, there was one above-FRL result for aroclor-1254 from the initial certification sampling,
21 which was less than two times the FRL. A statistical analysis conducted on the aroclor-1254 results
22 indicated that the CU did not meet all of the certification criteria discussed in Section 2.2.4 by having a
23 90% UCL on the mean for aroclor-1254 of 294.8 micrograms per kilogram ($\mu\text{g}/\text{kg}$) where the FRL for this
24 COC is only 130 $\mu\text{g}/\text{kg}$. These statistics are presented in Appendix A. Although there was only a single
25 result that was greater than the FRL and the mean was well below the FRL, the variability for the CU was
26 extremely large coupled with the fact that the data were lognormally distributed. This resulted in the UCL
27 being greater than twice the FRL. In an effort to reduce the variability and to remove the single above-
28 FRL area, the sample location with the above-FRL result and the sample location with the next highest
29 result, which was below the FRL, were excavated. Following excavation, real-time scanning using the
30 HPGe detectors was performed in the areas for verification that there were still no radiological constituents
31 greater than the action limit at the new surface. Locations of this activity are depicted on Figures 5-1
32 through 5-3. V/FCN 20803-PSP-0002-04 was then written to collect additional samples from these two
33 locations as well as from an additional random location within each of the two affected sub-CUs to

1 demonstrate that the remainder of the sub-CU was adequately represented statistically. Once again, one of
2 the four new results was just above the FRL, but in the sub-CU that had the second highest result.

3
4 As shown in Figures 2-2 and 2-3, this particular CU is odd-shaped and spans an area that extends from a
5 section of the northernmost portion of Area 3A, down the western boundary, and cuts across a small
6 fraction of the southern boundary. Based on the aroclor-1254 concentration distribution across this CU,
7 which demonstrates that the southern section (Sub-CUs 1 through 9) of this CU contained the majority of
8 the elevated results, this certification unit was divided into two separate and unique CUs for aroclor-1254,
9 termed A3A-C01A and A3A-C01B, to better present the distribution of this ASCOC.

10
11 A3A-C01A represents the northern section of A3A-C01 (Sub-CUs 10 through 16), which contains the
12 lower concentrations of aroclor-1254. A3A-C01B represents the southern section of A3A-C01
13 (Sub-CUs 1 through 9), which again contains the most elevated results including the sub-CUs that were
14 re-excavated (Sub-CUs 4 and 8) with their newly collected confirmation samples and additional random
15 samples.

16
17 A statistical analysis of each of these two newly created CUs with the available sampling results was
18 performed and is presented in Appendix B. For A3A-C01A, no results were greater than the FRL for
19 aroclor-1254. Typically, if all samples results within a particular CU are below the FRL for a given
20 constituent, no formal statistics are presented, specifically the *a posteriori* test. However, in this case there
21 are much less than the routine 12 samples in A3A-C01A. Therefore, statistics were performed for this CU
22 that demonstrate through the *a posteriori* test that a sufficient number of samples were collected to make
23 the certification conclusions. These statistics are presented in Appendix B.

24
25 For A3A-C01B, a single result was above the FRL and therefore the routine certification statistics were
26 performed. For sub-CUs 4 and 8 where additional excavations were conducted, there were two second
27 round sampling results from each of the sub-CUs (one resample after excavation and another random
28 location). The highest result for each of the two sub-CUs was used for the statistical analysis, similar to
29 how duplicate samples are treated, in an effort not to over-weight these two sub-CUs. These statistics,
30 which are presented in Appendix B, demonstrate that this CU passes all certification requirements.

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1 A3A-C02

2 A3A-C02 is in a high leachability zone in which the total uranium FRL is lower (20 mg/kg). This CU
3 passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are presented in
4 Appendix B.

5
6 A3A-C03

7 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
8 presented in Appendix B.

9
10 A3A-C04

11 A3A-C04 is in a high leachability zone in which the total uranium FRL is lower [20 mg/kg (micrograms
12 per gram, $\mu\text{g/g}$)]. As discussed in Section 3.2, A3A-C04 required additional excavation to remove total
13 uranium due to failing the preliminary certification statistics, which are presented in Appendix A. The
14 resample results and associated statistical analysis performed after the additional excavation are discussed
15 below.

16
17 Other than the total uranium issue, the remainder of the constituents for A3A-CU04 passed all certification
18 requirements. Therefore, the final certification data for those COCs are presented in Appendix B.

19
20 In A3A-C04, there were two above-FRL results for total uranium from the initial certification sampling,
21 which were less than two times the FRL. A statistical analysis conducted on the total uranium results
22 indicated that the CU did not meet all of the certification criteria discussed in Section 2.2.4 by having a
23 95% upper confidence limit (UCL) on the mean for total uranium of 21.83 $\mu\text{g/g}$ where the FRL for this
24 COC is only 20 $\mu\text{g/g}$. These statistics are presented in Appendix A. Although there were only two results
25 that were greater than the FRL and the mean was well below the FRL, the variability for the CU was fairly
26 large coupled with the fact that the data were lognormally distributed. This resulted in the UCL being
27 greater than the FRL. In an effort to reduce the variability and to remove the above-FRL areas; both
28 sample locations with the above-FRL results were excavated. Following excavation, real-time scanning
29 using the high-purity germanium (HPGe) detectors was performed in the areas for verification that there
30 were still no radiological constituents greater than the action limit at the new surface. Locations of this
31 activity are depicted on Figures 5-1 through 5-3. V/FCN 20803-PSP-0002-03 was then written to collect
32 additional samples from these two locations as well as from an additional random location within each of

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1 the two affected sub-CUs to demonstrate that the remainder of the sub-CU was adequately represented.
2 Once again, one of the four results was just above the FRL.

3
4 The routine certification statistics were performed. For sub-CUs 9 and 15 where additional excavations
5 were conducted, there were two second round sampling results from each of the sub-CUs (one resample
6 after excavation and another location). The highest result for each of the two sub-CUs was used for the
7 statistical analysis, similar to how duplicate samples are treated, in an effort not to over-weight these two
8 sub-CUs. These statistics, which are presented in Appendix B, demonstrate that this CU passes all
9 certification requirements after the additional excavation.

10
11 A3A-C05

12 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
13 presented in Appendix B.

14
15 A3A-C06

16 A3A-C06 is in a high leachability zone in which the total uranium FRL is lower (20 mg/kg). This CU
17 passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are presented in
18 Appendix B.

19
20 A3A-C07

21 A3A-C07 is in a high leachability zone in which the total uranium FRL is lower (20 mg/kg). This CU
22 passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are presented in
23 Appendix B.

24
25 CU 8 - Boiler Plant Breach of the GMA

26 A3A-C08 encompasses the area where the excavation activities came within 5 feet of the sands and gravels
27 of the GMA in the Boiler Plant. Samples were collected from five sample locations in this area prior to it
28 being backfilled as required. These samples were analyzed for the obligatory radiological constituents
29 (total uranium, radium-226, radium-228, thorium-228, thorium-232, and technetium-99) as identified in
30 Section 2. Analysis of the samples for the required ecological ASCOCs (cadmium, molybdenum, and
31 silver) was not performed; therefore there are only 11 sample results for the ecological ASCOCs in this
32 specific CU. The radiological data was validated consistent with the certification protocols and the data
33 were included with A3A-C08 during the statistical analysis. This CU passed all of the certification criteria

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1 as discussed in Section 2.2.4. Final certification data are presented in Appendix B. Additional
2 information regarding the GMA sampling effort can be found in Section 2.2.2.

3
4 A3A-C09

5 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
6 presented in Appendix B.

7
8 A3A-C10

9 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
10 presented in Appendix B.

11
12 A3A-C11

13 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
14 presented in Appendix B.

15
16 A3A-C12

17 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
18 presented in Appendix B.

19
20 A3A-C13

21 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
22 presented in Appendix B.

23
24 A3A-C14

25 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
26 presented in Appendix B.

27
28 A3A-C15

29 In A3A-C06, there was one sample, A3A-C15-7, in which the laboratory did not analyze for the primary
30 radiological constituents. The radiological data for this sample are currently not available; therefore the
31 statistical analysis was conducted without this data and indicated that the CU met all certification criteria
32 discussed in Section 2.2.4. This CU passed all of the certification criteria as discussed in Section 2.2.4.

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1 Final certification data are presented in Appendix B. Once the last sample result is provided from the
2 laboratory a new set of statistics will be performed and presented in the final Certification Report.

3

4 A3A-C16

5 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
6 presented in Appendix B.

7

8 A3A-C17

9 A3A-C17 is in a high leachability zone in which the total uranium FRL is lower (20 mg/kg). This CU
10 passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are presented in
11 Appendix B.

12

13 A3A-C18 - Plant 9 Breach of the GMA

14 A3A-C18 is in a high leachability zone in which the total uranium FRL is lower (20 mg/kg). This CU
15 encompasses the area where the excavation activities came within 5 feet of the sands and gravels of the
16 GMA in Plant 9. Sampling of this area prior to backfilling was required. Samples were collected from
17 two sample locations in this area prior to it being backfilled as required. These samples were analyzed for
18 the obligatory radiological constituents (total uranium, radium-226, radium-228, thorium-228,
19 thorium-232, and technetium-99) as identified in Section 2. Analysis of the samples for the ecological
20 ASCOCs (cadmium, molybdenum, and silver) was not performed; therefore there are only 10 sample
21 results for the ecologic ASCOCs in this specific CU. The radiological data was validated consistent with
22 the certification protocols and the data were included with A3A-C08 during the statistical analysis. This
23 CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
24 presented in Appendix B. Additional information regarding the GMA sampling effort can be found in
25 Section 2.2.2.

26

27 A3A-C19 - UST #3

28 As discussed in Section 2.1.1 of the CDL, UST #3 is in Area 3A and is being closed under the scope of
29 this certification. The excavated footprint of UST #3 is defined as a distinct CU, A3A-C19, and the
30 constituents for this CU are identified in Section 2. This CU passed all of the certification criteria as
31 discussed in Section 2.2.4. Final certification data are presented in Appendix B.

32

1 A3A-C20 - Discovered UST

2 As discussed in Section 2.1.1 of the CDL, a UST was discovered in Area 3A during the excavation
3 activities in Plant 9. This UST is being closed under the scope of this certification. The excavated
4 footprint this discovered UST is defined as a distinct CU, A3A-C20, and the constituents for this CU are
5 identified in Section 2. A3A-C20 is also in a high leachability zone in which the total uranium FRL is
6 lower (20 mg/kg). This CU passed all of the certification criteria as discussed in Section 2.2.4. Final
7 certification data are presented in Appendix B.

8
9 5.1.2 Area 3B

10 A3B-C01

11 A3B-C01 is in a high leachability zone in which the total uranium FRL is lower (20 mg/kg). This CU
12 passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are presented in
13 Appendix B.

14
15 A3B-C02

16 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
17 presented in Appendix B.

18
19 A3B-C03

20 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
21 presented in Appendix B.

22
23 A3B-C04

24 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
25 presented in Appendix B.

26
27 A3B-C05

28 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
29 presented in Appendix B.

30

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- 1 A3B-C06
- 2 A3B-C06 is in a high leachability zone in which the total uranium FRL is lower (20 mg/kg). This CU
- 3 passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are presented in
- 4 Appendix B.
- 5
- 6 A3B-C07
- 7 A3B-C07 is in a high leachability zone in which the total uranium FRL is lower (20 mg/kg). This CU
- 8 passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are presented in
- 9 Appendix B.
- 10
- 11 A3B-C08
- 12 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
- 13 presented in Appendix B.
- 14
- 15 A3B-C09
- 16 A3B-C09 is in a high leachability zone in which the total uranium FRL is lower (20 mg/kg). This CU
- 17 passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are presented in
- 18 Appendix B.
- 19
- 20 A3B-C10
- 21 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
- 22 presented in Appendix B.
- 23
- 24 A3B-C11
- 25 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
- 26 presented in Appendix B.
- 27
- 28 A3B-C12
- 29 This CU passed all of the certification criteria as discussed in Section 2.2.4. Final certification data are
- 30 presented in Appendix B.
- 31

1 Pile 1, Pile 2, and Pile 3 CUs

2 As discussed in Section 4.1.2 of the CDL, the "certifiable" soil that was removed while constructing the
3 ditches surrounding Area 3B was placed on the inside of the ditch line so that it could be certified with the
4 rest of the area. This soil was confined to small areas near the west ditch line, the southwest ditch line, and
5 the east ditch line. These collections of sub-grade soil are being certified as individual CUs, Pile 1, Pile 2,
6 and Pile 3, which are stratified above the plan of surface certification. Pile 1 consisted of soil placed on
7 the west ditch line in Area 3B CUs 4, 5, and 8, Pile 2 consisted of soil placed on the east ditch line in
8 Area 3B CUs 2, 10, and 12, and Pile 3 consisted of soil placed on the southwest ditch line in Area 3B
9 CU 3. These CUs pass all of the certification criteria as discussed in Section 2.2.4. Final certification data
10 are presented in Appendix B.

11
12 A3B-HWMU20

13 As discussed in Section 4.1.2 of the CDL, there is one HWMU (HWMU #20) in Area 3B that is being
14 closed under the scope of this certification effort. The size of HWMU #20 encompasses most of Area 3B;
15 however Area 3B does not fully encompass the lateral extent of the HWMU. Therefore, four additional
16 points were placed outside of the Area 3B certification boundary yet within the HWMU boundary to
17 provide full coverage of the HWMU and to satisfy closure.

18
19 Every sample within Area 3B, including the four additional HWMU points, were analyzed for the COCs
20 identified specifically for HWMU #20. Based on SEP protocol described in Section 2.2.5, a unique CU
21 should be established with a minimum of eight sample locations collected and analyzed for the HWMU
22 COCs. In all, 181 samples (excluding field duplicates) were collected across the footprint of the HWMU.
23 Consistent with Section 2.2.5 of the SEP, the data for these constituents were then compared to their
24 respective FRL. All of the HWMU COC data from the soil samples collected within the HWMU footprint
25 were below the established site-specific FRLs, therefore closing HWMU #20.

26
27 As an added measure, the calculations described in the Closure Plan Review Guidance for RCRA
28 Facilities (OEPA 2004) by the Ohio Environmental Protection Agency Division of Hazardous Waste
29 Management (DHWM), were performed. Specifically, Appendix N, Section entitled "Using GCNs to
30 Determine that No Further Action is Necessary at a Unit" was used.

31
32 In short, this OEPA guidance describes the application of General Cleanup Numbers (GCNs) to a specific
33 RCRA site. According to this guidance, elimination of a COC from assessment can be done based on two

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1 conditions; 1) if the frequency of detection is less than 5%, and 2) the 95% UCL or maximum
2 concentration of the compound is below the site-specific background for the compound (for inorganic
3 metals only). Of the list of COCs for HWMU #20 [barium, lead, methylene chloride, tetrachloroethene
4 (PCE), 1,1,1-trichloroethane (1,1,1-TCA), and xylenes], PCE and 1,1,1-TCA have a frequency of
5 detection less than 5%. The maximum concentration for barium is 255 mg/kg where the site-specific
6 maximum background value is 261 mg/kg. Finally, lead does not have a GCN. Therefore, only methylene
7 chloride and xylenes were retained for assessment, as they had a frequency of detection greater than 5%
8 and are not inorganic metal constituents below the site-specific background conditions.

9
10 Once the list of COCs to be assessed was defined, the appropriate adjusted GCN used in the calculations
11 was defined using the 20 DAF (dilution attenuation factor) from Table O-1 of the Closure Plan Review
12 Guidance for RCRA Facilities (OEPA 2004), as the source area is less than 30 acres. The calculations
13 were performed and are presented in Appendix D of this document. Also presented in Appendix D are
14 graphical comparisons of all HWMU RCRA COC data against the FRL, site-specific background levels
15 (if applicable), soil GCN, and groundwater GCN (both 1 DAF and 20 DAF) for the constituents that had a
16 GCN.

17
18 The results of these calculations demonstrate that the cancer risk is 1.40 E-06, which is below the
19 acceptable cancer risk level of 1.00 E-05. Additionally, the non-cancer risk equals 0.0185, which is less
20 than the acceptable non-cancer risk level of 1.00.

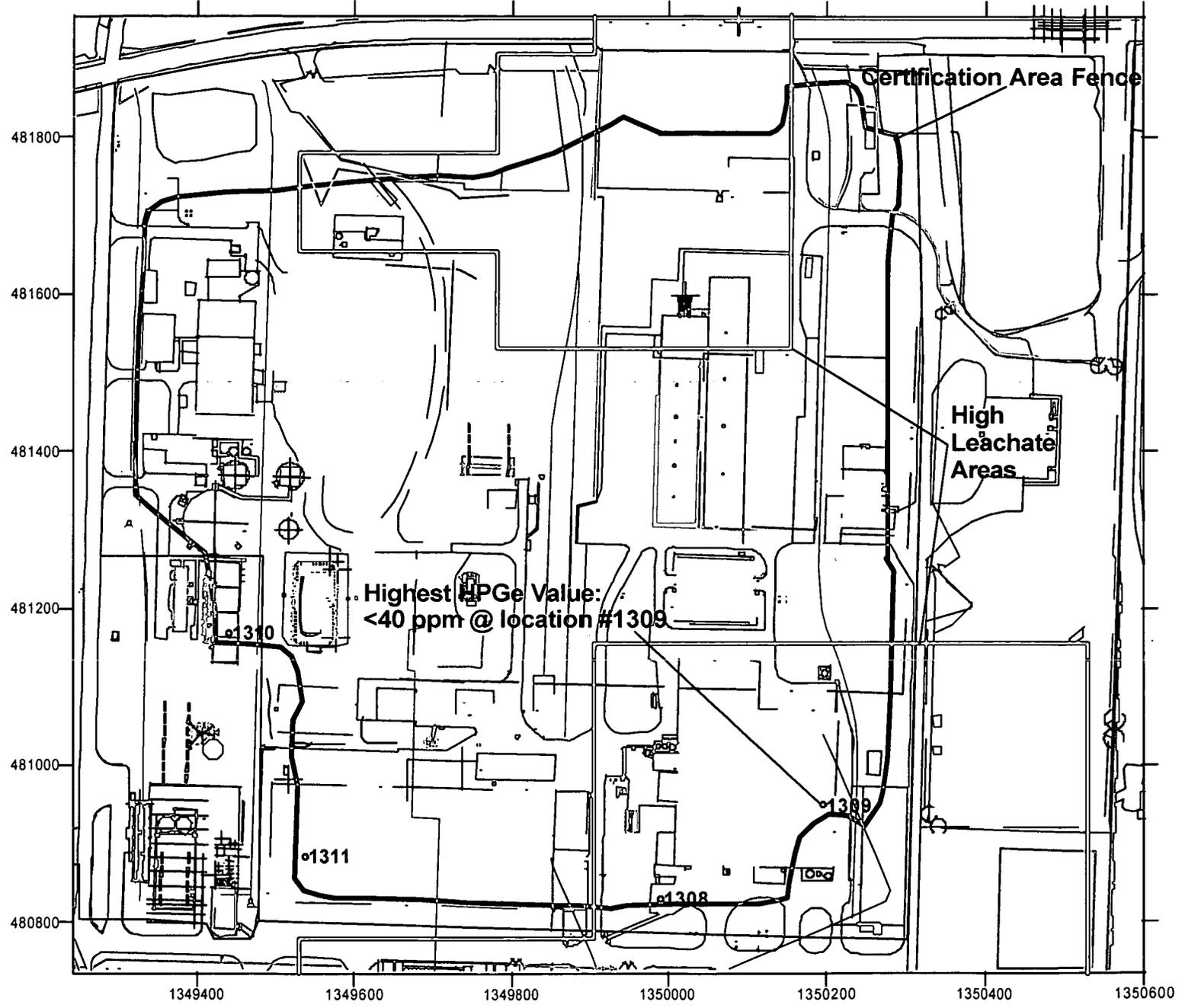
21
22 Taking both approaches (SEP protocols and OEPA DHWM guidance) into consideration, HWMU #20
23 passes all relevant criteria and therefore is considered closed.

24 25 5.2 AREAS 3A AND 3B CERTIFICATION CONCLUSIONS

26 Based on the certification analytical results, precertification data, and statistical analysis, DOE has
27 determined that the remedial objectives in the OU5 ROD have been achieved for Areas 3A and 3B,
28 HWMU #20, and the two USTs within Area 3A and no further remedial actions are required. This portion
29 of the FCP will be released for restoration and final land use upon EPA and OEPA concurrence.

FIGURE 5-1. ELEVATED CONSTITUENT REMOVAL VERIFICATION FOR A3A-C01 AND A3A-C04 MOISTURE CORRECTED TOTAL URANIUM

Field of View to Scale
HPGe DET#: 30699
Measurement Date: 11/23/04

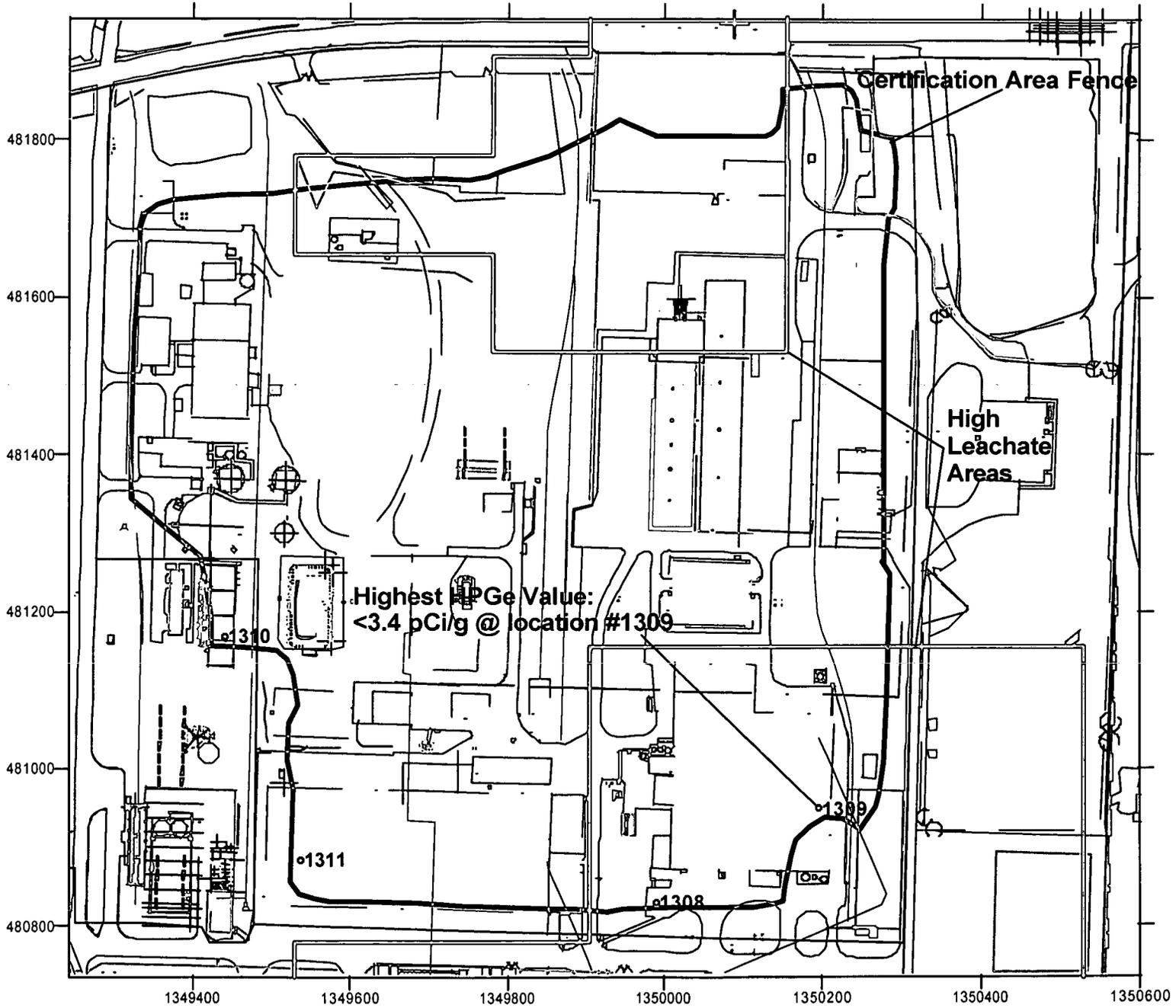


HPGe @ 15cm Total U (ppm) FRL= 20 ppm	HPGe @ 15cm Total U (ppm) FRL= 82 ppm
○ 0 to 20	○ 0 to 82
○ 20 to 40	○ 82 to 164
○ 40 to 60	○ 164 to 246
○ 60 to 928	○ 246 to 928
○ 928 to 9999	○ 928 to 9999

RTIMP DWG Title: A3A_P2_PhysSampHS_TU.SRF
 Project Name: A3A/4A Exc. Char. and PreCert
 Project #: 20200-PSP-0009
 Verified By: Curt Baumann/78329
 Date Verified: 11/24/04
 Support Data: A3A_P2_PhysSampHS_HPGe_15cm.xls;
 A3A_P2_PhysSampHS_HL_HPGe_15cm.xls

FIGURE 5-2. ELEVATED CONSTITUENT REMOVAL VERIFICATION FOR A3A-C01 AND A3A-C04 MOISTURE CORRECTED RADIUM-226

Field of View to Scale
HPGe DET#: 30699
Measurement Date: 11/23/04



HPGe @ 15cm Ra-226 (pCi/g)	
○	0 to 1.7
○	1.7 to 3.4
○	3.4 to 5.1
○	5.1 to 9999

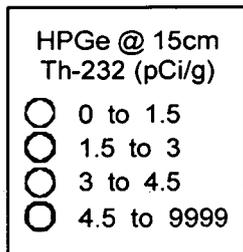
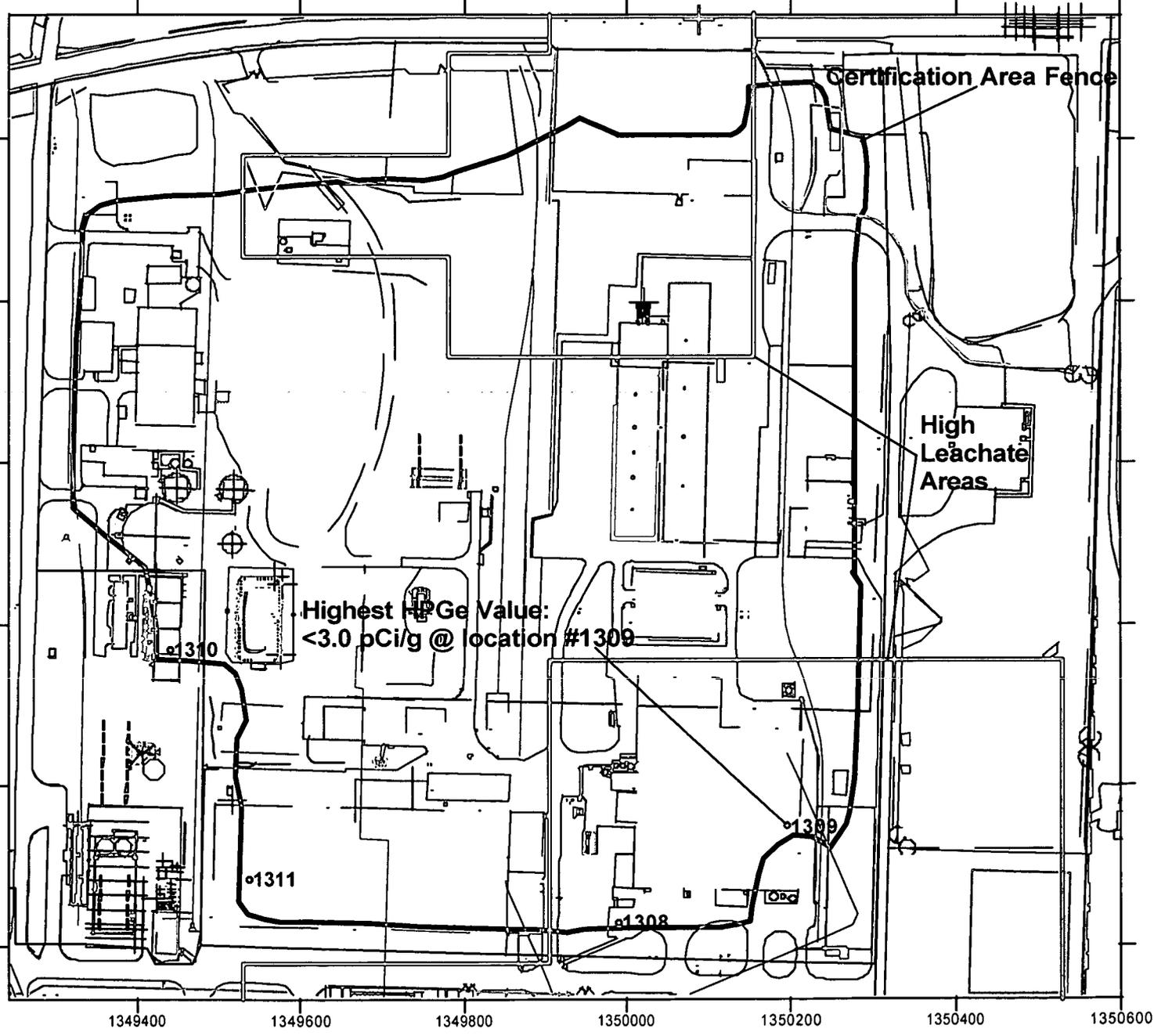
RTIMP DWG Title: A3A_P2_PhysSampHS_RA.SRF
 Project Name: A3A/4A Exc. Char. and PreCert
 Project #: 20200-PSP-0009
 Verified By: Curt Baumann/78329
 Date Verified: 11/24/04
 Support Data: A3A_P2_PhysSampHS_HPGe_15cm.xls;
 A3A_P2_PhysSampHS_HL_HPGe_15cm.xls

FIGURE 5-3. ELEVATED CONSTITUENT REMOVAL VERIFICATION FOR A3A-C01 AND A3A-C04 MOISTURE CORRECTED THORIUM-232

Field of View to Scale

HPGe DET#: 30699

Measurement Date: 11/23/04



RTIMP DWG Title: A3A_P2_PhysSampHS_TH.SRF
 Project Name: A3A/4A Exc. Char. and PreCert
 Project #: 20200-PSP-0009
 Verified By: Curt Baumann/78329
 Date Verified: 11/24/04
 Support Data: A3A_P2_PhysSampHS_HPGe_15cm.xls;
 A3A_P2_PhysSampHS_HL_HPGe_15cm.xls

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1 **6.0 PROTECTION OF CERTIFIED AREAS**

2
3 DOE has restricted access to certified areas in order to maintain their integrity prior to transfer for final
4 land use. FCP Procedure EP-0008 has been developed to implement a process to protect certified areas
5 from becoming re-contaminated.

6
7 The procedure is summarized as follows:

- 8
- 9 • At the beginning of certification sampling activities for a remediation area, the perimeter of the
10 “certified” area will be clearly delineated
 - 11
 - 12 • Signs will be posted upon the temporary perimeter limiting access to authorized individuals or
13 projects
 - 14
 - 15 • To gain access to conduct work in a “certified” area, the person or project desiring access will
16 submit a request to the Compliance section of Demolition, Soil and Disposal Project (DSDP)
 - 17
 - 18 • Any equipment to be used within the “certified” area must have been cleaned in accordance with
19 FCP certified area access
 - 20
 - 21 • Employees/operators should be briefed on the entry and exit requirements for a “certified” area
 - 22
 - 23 • Additional restrictions apply to certified areas that have been restored. The DSDP Natural
24 Resources Group will approve request for access in writing prior to entry.
 - 25

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

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- 1 U.S. Department of Energy, 2004c, "Implementation Plan for Area 3B/4B/5," Final, Fernald Closure
- 2 Project, DOE, Fernald Area Office, Cincinnati, Ohio
- 3
- 4 U.S. Department of Energy, 2004d, "Project Specific Plan for Excavation Control of Areas 3B, 4B and 5
- 5 (Supplement to 20300-PSP-0011)," Revision 1, Fernald Closure Project, DOE, Fernald Area Office,
- 6 Cincinnati, Ohio.
- 7
- 8 U.S. Environmental Protection Agency, 1994, "National Functional Guidelines for Data Review
- 9 (Inorganic Data)," U.S. EPA Office of Solid Waste and Emergency Response, Washington, DC.
- 10
- 11 Ohio Environmental Protection Agency, 2004, "Closure Plan Review Guidance for RCRA Facilities,"
- 12 Ohio EPA Division of Hazardous Waste Management, Dayton, Ohio.

APPENDIX A

FAILING PRELIMINARY CERTIFICATION STATISTICS

SAMPLEID	Aroclor-1254
A3A-C01-1^1	1.5 J
A3A-C01-3^1	17 -
A3A-C01-4^1	120 -
A3A-C01-5^1	67 -
A3A-C01-6^1	14 -
A3A-C01-8^1	180 J
A3A-C01-8^1-D	73 J
A3A-C01-9^1	81 -
A3A-C01-10^1	10 J
A3A-C01-11^1	1.6 J
A3A-C01-13^1	3.6 J
A3A-C01-14^1	4.6 J
A3A-C01-15^1	42 -
Limit	130
Units	ug/kg
Conf. Level	90%
Max. Result	180
Max. > Limit	Yes
W-statistic Prob. #	48.4% (LN)
Test Procedure	Lognormal
Sample Size	12
Nondetects	0
% Nondetects	0.0%
Est. Mean*	66.6
UCL	294.8
Prob. > Limit	0.03%
Pass / Fail	FAIL

<i>a.posteriori</i> Sample	4
Size calculation	Pass

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.

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CERTIFICATION UNIT A3A-C04

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SAMPLEID	Uranium, Total
A3A-C04-1^1	6.86 -
A3A-C04-3^1	8.17 -
A3A-C04-4^1	3.68 -
A3A-C04-6^1	3.41 -
A3A-C04-7^1	7.94
A3A-C04-8^1	7.44 -
A3A-C04-8^1-D	5.06 -
A3A-C04-9^1	36.9 -
A3A-C04-10^1	6.17 -
A3A-C04-12^1	2.04 UJ
A3A-C04-14^1	5.26 -
A3A-C04-15^1	25.7 -
A3A-C04-16^1	6.08 -
Limit	20
Units	ug/g
Conf. Level	95%
Max. Result	36.9
Max. > Limit	Yes
W-statistic Prob. #	33.1% (LN)
Test Procedure	Lognormal
Sample Size	12
Nondetects	1
% Nondetects	8.3%
Est. Mean*	10.17
UCL	21.83
Prob. > Limit	0.03%
Pass / Fail	FAIL

<i>a posteriori</i> Sample Size calculation	6 Pass
---	-----------

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.

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APPENDIX B

**CERTIFICATION SAMPLES, ANALYTICAL RESULTS
AND FINAL STATISTICS TABLES**

APPENDIX B
STATISTICAL ABBREVIATIONS AND SYMBOLS

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The procedure used to determine if the data are to be assumed to be either normally distributed or lognormally distributed is outlined in Section G.2.3 of Appendix G to the SEP. The second paragraph under "Step 3: Perform the Shapiro-Wilk Test to evaluate if the data are normally or lognormally distributed" states that "If the Shapiro-Wilk Test indicates both normal and lognormal distributions fit the data, the distribution with the highest p-value will be used in the Student's t-Test (Section G.2.2.2) to make the certification decision." Therefore, the distribution testing procedure is not a matter of transforming the data and then testing for lognormality only when the normality assumption fails as the comment seems to imply. The method is to test both normality and lognormality and select the distribution that "best" fits the data as defined by the test yielding the higher p-value above a minimum acceptable value. The minimum acceptable p-value for acceptance of a distribution was set at 0.05.

Abbreviations:

W-Statistic Probability - Shapiro-Wilk probability of the "better" fit – either normal or lognormal (note: a value less than 0.05 indicates that neither normality nor lognormality could be accepted, but the highest p-value is still shown.)

t-Test (N) - indicates that the normal distribution is best fit to data with a p-value greater than or equal to 0.05.

t-Test (LN) - indicates that the lognormal distribution is best fit to data with a p-value greater than or equal to 0.05.

Sign Test - the Sign test was used because one of the following situations occurred:

- 1. there were greater than 50 percent non-detects,
- 2. between 15 and 50 percent non-detects and data not symmetrically distributed,
- 3. less than 15 percent non-detects, but fails Shapiro-Wilk test for both normality and lognormality and data not symmetrically distributed.

Wilcoxon SR - the Wilcoxon Signed Rank procedure was used because of one of the following situations:

- 1. between 15 and 50 percent non-detects and data symmetrically distributed,
- 2. less than 15 percent non-detects, but fails Shapiro-Wilk test for both normality and lognormality and data symmetrically distributed.

Note: Data was considered to be "symmetrically distributed" if the Standardized Skewness had an Absolute Value of less than or equal to 2.00 (i.e., between -2.00 and 2.00).

Number of NDs - number of non-detects.

@ - maximum result was below the FRL indicating that no statistical result needed to be reported.

CERTIFICATION UNIT A3A-C01

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum
A3A-C01-1^1	0.779 J	0.683 J	0.695 J	0.683 J	4.06 -	0.833 U	0.35 J	2.1 -
A3A-C01-3^1	0.835 J	0.572 J	0.58 J	0.572 J	3.79 -	0.801 U	0.34 J	1.4 -
A3A-C01-4^1	0.896 J	0.711 J	0.715 J	0.711 J	8.22 -	0.782 U	0.35 J	1.3 -
A3A-C01-5^1	0.734 J	0.468 J	0.486 J	0.468 J	4.19 -	0.712 U	0.25 J	1.4 -
A3A-C01-6^1	0.871 J	0.615 J	0.626 J	0.615 J	6.74 -	0.813 U	0.27 J	1.2 -
A3A-C01-8^1	0.796 J	0.714 J	0.762 J	0.714 J	5.99 -	0.842 U	0.27 J	1.5 -
A3A-C01-8^1-D	0.954 J	0.708 J	0.686 J	0.708 J	5.86 -	0.865 U	0.32 J	1.6 -
A3A-C01-9^1	0.776 J	0.612 J	0.618 J	0.612 J	7.97 -	0.917 U	0.32 J	2.1 -
A3A-C01-10^1	0.792 J	0.623 J	0.637 J	0.623 J	4.54 -	0.761 U	0.3 J	1.6 -
A3A-C01-11^1	0.814 J	0.65 J	0.68 J	0.65 J	4.23 -	0.811 U	0.34 J	1.2 -
A3A-C01-13^1	0.818 J	0.665 J	0.66 J	0.665 J	5.91 -	0.82 U	0.36 J	1.4 -
A3A-C01-14^1	0.805 J	0.634 J	0.616 J	0.634 J	5.01 -	0.796 U	0.35 J	1.7 -
A3A-C01-15^1	0.952 J	0.751 J	0.769 J	0.751 J	6.82 -	0.826 U	0.37 J	1.3 -
Limit	1.7	1.8	1.7	1.5	82	30	82	2900
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	0.954	0.751	0.769	0.751	8.22	0.917 U	0.37	2.1
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3A-C01

(cont.)

SAMPLEID	Silver	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	
A3A-C01-1^1	0.059 J	See A3A-C01A and A3A-C01B	3.6 U	36 U	36 U	36 U	
A3A-C01-3^1	0.057 J		7.9 J	36 U	59 J	73 J	
A3A-C01-4^1	0.065 J		18 J	190 -	190 -	250 -	
A3A-C01-5^1	0.041 J		11 J	35 U	43 J	60 J	
A3A-C01-6^1	0.054 J		3.7 J	59 U	59 U	59 U	
A3A-C01-8^1	0.06 J		86 J	35 U	180 J	330 J	
A3A-C01-8^1-D	0.07 J		57 J	36 U	28 J	170 J	
A3A-C01-9^1	0.065 J		39 -	1300 -	1300 -	1700 -	
A3A-C01-10^1	0.057 J		6.5 J	35 U	26 J	38 J	
A3A-C01-11^1	0.047 J		3.6 U	36 U	36 U	36 U	
A3A-C01-13^1	0.052 J		3.3 J	700 -	780 -	990 -	
A3A-C01-14^1	0.057 J		3.4 J	36 U	37 J	68 J	
A3A-C01-15^1	0.063 J		19 -	73 U	47 J	70 J	
Limit	29000			130	20000	2000	20000
Units	mg/kg			ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%		90%	90%	90%	90%	
Max. Result	0.07		86	1300	1300	1700	
Max. > Limit	No		No	No	No	No	
W-statistic Prob. #	--		--	--	--	--	
Test Procedure	--		--	--	--	--	
Sample Size	12		12	12	12	12	
Nondetects	0		2	9	3	3	
% Nondetects	0.0%		16.7%	75.0%	25.0%	25.0%	
Est. Mean*	--		--	--	--	--	
UCL	--		--	--	--	--	
Prob. > Limit	--		--	--	--	--	
Pass / Fail	--		--	--	--	--	
<i>a posteriori</i> Sample Size calculation	--		--	--	--	--	

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.

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(cont.)

SAMPLEID	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene
A3A-C01-1^1	36 U	36 U	36 U	18 U	36 U	36 U
A3A-C01-3^1	36 U	29 J	75 J	18 U	92 J	25 J
A3A-C01-4^1	110 -	120 -	210 -	18 U	280 J	100 -
A3A-C01-5^1	35 U	29 J	59 J	18 U	70 J	22 J
A3A-C01-6^1	59 U	59 U	59 U	29 U	59 U	59 U
A3A-C01-8^1	35 U	94 J	200 J	18 U	310 J	88 J
A3A-C01-8^1-D	36 U	52 J	110 J	18 U	160 J	46 J
A3A-C01-9^1	650 -	590 -	1200 -	18 U	2600 -	550 -
A3A-C01-10^1	35 U	18 J	31 J	18 U	47 J	35 U
A3A-C01-11^1	36 U	36 U	36 U	18 U	36 U	36 U
A3A-C01-13^1	520 -	480 -	830 -	18 U	1800 -	440 -
A3A-C01-14^1	36 U	36 U	41 J	18 U	48 J	36 U
A3A-C01-15^1	73 U	73 U	61 J	36 U	94 J	73 U
Limit	200000	1000 (BTV)	2000000	2000	10000 (BTV)	20000
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%
Max. Result	650	590	1200	36 U	2600	550
Max. > Limit	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Nondetects	9	5	3	12	3	6
% Nondetects	75.0%	41.7%	25.0%	100.0%	25.0%	50.0%
Est. Mean*	--	--	--	--	--	--
UCL	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3A-C01

(cont.)

SAMPLEID	Phenanthrene	Pyrene	1,1-Dichloroethene	1,2-Dichloroethene (Total)	Tetrachloroethene	Trichloroethene
A3A-C01-1^1	36 U	36 U	5 J	0.9 U	0.91 U	0.9 J
A3A-C01-3^1	36 J	81 J	0.9 U	0.9 U	0.86 UJ	0.9 U
A3A-C01-4^1	130 J	310 J	0.9 U	0.9 U	0.87 U	0.9 U
A3A-C01-5^1	32 J	76 J	0.9 U	0.9 U	0.89 U	0.9 U
A3A-C01-6^1	59 U	59 U	4.5 J	0.9 U	2.8 J	13 J
A3A-C01-8^1	140 J	280 J	0.9 U	0.9 U	0.94 U	0.9 U
A3A-C01-8^1-D	69 J	160 J	1 U	1 U	0.96 U	1 U
A3A-C01-9^1	1800 -	2500 -	1.1 U	1.1 U	1.1 U	1.1 U
A3A-C01-10^1	24 J	42 J	0.9 U	0.9 U	0.91 UJ	0.9 U
A3A-C01-11^1	36 U	18 J	0.8 U	0.8 U	0.78 UJ	0.8 U
A3A-C01-13^1	1400 -	1600 -	0.8 U	0.8 U	0.8 U	0.8 U
A3A-C01-14^1	28 J	52 J	1 U	1 U	1 U	1 U
A3A-C01-15^1	39 J	89 J	1 U	1 U	1 U	1 U
Limit	5000 (BTV)	10000 (BTV)	410	160	3600	25000
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%
Max. Result	1800	2500	5	1.1 U	2.8	13
Max. > Limit	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Nondetects	3	2	10	12	11	10
% Nondetects	25.0%	16.7%	83.3%	100.0%	91.7%	83.3%
Est. Mean*	--	--	--	--	--	--
UCL	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3A-C01A

SAMPLEID	Aroclor-1254
A3A-C01-10^1	10.00 J
A3A-C01-11^1	1.60 J
A3A-C01-13^1	3.60 J
A3A-C01-14^1	4.60 J
A3A-C01-15^1	42.00 -
Limit	130
Units	ug/kg
Conf. Level	90%
Max. Result	42
Max. >= Limit	No
W-statistic Prob. #	74.3% (LN)
Test Procedure	Lognormal
Sample Size	5
Nondetects	0
% Nondetects	0.0%
Est. Mean*	13.8
UCL	126
Prob. > Limit	--
Pass / Fail	pass

<i>a posteriori</i> Sample Size calculation	2 Pass
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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.

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CERTIFICATION UNIT A3A-C01B

E-5777

SAMPLEID	Aroclor-1254
A3A-C01-1^1	1.50 J
A3A-C01-3^1	17.00 -
A3A-C01-5^1	67.00 -
A3A-C01-6^1	14.00 -
A3A-C01-9^1	81.00 -
A3A-C01-8A^1	3.8 U
A3A-C01-17^1 (duplicate for sub-CU 8)	84.90 J
A3A-C01-4A^1	10.2 J
A3A-C01-18^1 (duplicate for sub-CU 4)	148.00 J
Limit	130
Units	ug/kg
Conf. Level	90%
Max. Result	148
Max. >= Limit	Yes
W-statistic Prob. #	43.5% (N)
Test Procedure	Normal
Sample Size	7
Nondetects	0
% Nondetects	0.0%
Est. Mean*	59.1
UCL	87.4
Prob. > Limit	--
Pass / Fail	pass

<i>a posteriori</i> Sample	4
Size calculation	Pass

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.

CERTIFICATION UNIT A3A-C02

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Arsenic	Beryllium	Cadmium
A3A-C02-1^1	0.799 -	0.562 J	0.55 J	0.562 J	8.27 -	0.784 U	6.1 -	0.5 -	0.29 J
A3A-C02-1^1-D	0.858 -	0.643 J	0.67 J	0.643 J	6.83 -	0.813 U	6.3 -	0.53 -	0.28 J
A3A-C02-3^1	0.832 -	0.563 J	0.569 J	0.563 J	4.06 -	0.882 U	4.4 -	0.48 -	0.24 J
A3A-C02-4^1	0.795 -	0.577 J	0.581 J	0.577 J	4.38 -	0.788 U	4.5 -	0.5 -	0.29 J
A3A-C02-5^1	0.74 -	0.708 J	0.721 J	0.708 J	2.81 -	0.874 U	6.8 -	0.57 -	0.24 J
A3A-C02-6^1	1.06 -	0.921 J	0.937 J	0.921 J	9.38 -	0.858 U	6.8 -	0.77 -	0.32 J
A3A-C02-8^1	1.07 -	0.923 J	0.897 J	0.923 J	11.2 -	0.853 U	6.7 -	0.8 -	0.31 J
A3A-C02-9^1	1.26 -	1.03 J	1.03 J	1.03 J	14.9 -	0.796 U	7.3 -	0.72 -	0.52 -
A3A-C02-10^1	1.16 -	0.918 J	0.925 J	0.918 J	10.4 -	0.791 U	6.7 -	0.75 -	0.35 J
A3A-C02-11^1	1.32 -	0.861 J	0.878 J	0.861 J	17.7 -	0.843 U	7.2 -	0.79 -	0.4 J
A3A-C02-13^1	1 -	0.933 J	0.932 J	0.933 J	7.34 -	0.748 U	7.4 -	0.76 -	0.33 J
A3A-C02-15^1	0.778 -	0.615 J	0.599 J	0.615 J	3.5 -	0.829 U	5.5 -	0.58 -	0.28 J
A3A-C02-16^1	0.767 -	0.778 J	0.785 J	0.778 J	1.88 U	0.858 U	5 -	0.69 -	0.28 J
Limit	1.7	1.8	1.7	1.5	20	30	12	1.5	82
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	1.32	1.03	1.03	1.03	17.7	0.882 U	7.4	0.8	0.52
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	1	12	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	8.3%	100.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3A-C02

(cont.)

SAMPLEID	Molybdenum	Silver	Aroclor-1254	Aroclor-1260	1,1-Dichloroethene	1,2-Dichloroethene (Total)	Tetrachloroethene	Trichloroethene
A3A-C02-1^1	1.3 -	0.048 J	25 -	15 -	1.5 J	1.2 U	1.2 U	1.2 U
A3A-C02-1^1-D	1.3 -	0.047 J	15 -	5.6 J	3.1 J	1.2 U	1.2 U	1.2 U
A3A-C02-3^1	1.2 -	0.041 J	3.5 U	3.5 U	4.2 J	1 U	1 U	1 U
A3A-C02-4^1	1.1 -	0.041 J	3.5 U	3.5 U	5.2 J	1.1 U	1.1 U	1.1 U
A3A-C02-5^1	1.6 -	0.041 J	3.6 U	3.6 U	0.6 J	1 U	1 U	1 U
A3A-C02-6^1	1.2 -	0.055 J	18 -	3.9 J	3.4 J	1 U	1 U	1 U
A3A-C02-8^1	1.3 -	0.058 J	25 -	7.6 J	1.1 U	1.1 U	1.1 U	1.1 U
A3A-C02-9^1	1.1 -	0.052 J	17 -	7.2 J	1.2 J	1.1 U	1.1 U	1.1 U
A3A-C02-10^1	1.3 -	0.06 J	67 -	12 J	4 J	1 U	1 U	1 U
A3A-C02-11^1	1.3 -	0.072 J	32 -	9.4 J	4.7 J	1.1 U	1.1 U	1.1 U
A3A-C02-13^1	1.1 -	0.05 J	6.3 -	2.6 J	7.2 J	1.2 U	1.2 U	1.2 U
A3A-C02-15^1	1.5 -	0.047 J	1.9 J	3.5 U	4.4 J	1 U	1 U	1 U
A3A-C02-16^1	1.7 -	0.04 J	3.6 U	3.6 U	3.4 J	1 U	1 U	1 U
Limit	2900	29000	130	130	410	160	3600	25000
Units	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	1.7	0.072	67	15	7.2	1.2 U	1.2 U	1.2 U
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	4	5	1	12	12	12
% Nondetects	0.0%	0.0%	33.3%	41.7%	8.3%	100.0%	100.0%	100.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3A-C03

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum	Silver
A3A-C03-1^1	0.86 J	0.729 J	0.759 J	0.729 J	6.08 -	0.836 U	0.28 J	1.4 -	0.043 J
A3A-C03-2^1	0.856 J	0.69 J	0.705 J	0.69 J	5.23 -	0.851 U	0.27 J	1.3 -	0.043 J
A3A-C03-3^1	1.03 J	0.782 J	0.783 J	0.782 J	3.98 -	0.875 U	0.31 J	1.2 -	0.056 J
A3A-C03-5^1	0.856 J	0.764 J	0.783 J	0.764 J	12.4 -	0.788 U	0.29 J	1.8 -	0.047 J
A3A-C03-7^1	0.863 J	0.548 J	0.575 J	0.548 J	7.4 -	0.836 U	0.27 J	1.4 -	0.045 J
A3A-C03-8^1	1.03 J	0.849 J	0.85 J	0.849 J	11 -	0.879 U	0.33 J	1.3 -	0.06 J
A3A-C03-9^1	1 J	0.823 J	0.82 J	0.823 J	12.8 -	0.864 U	0.33 J	1.4 -	0.057 J
A3A-C03-10^1	0.819 J	0.671 J	0.653 J	0.671 J	5.33 -	0.901 U	0.36 J	1.6 -	0.073 J
A3A-C03-10^1-D	1.02 J	0.722 J	0.733 J	0.722 J	8.21 -	0.892 U	0.3 J	1.3 -	0.055 J
A3A-C03-11^1	0.827 J	0.728 J	0.753 J	0.728 J	12.4 -	0.89 U	0.37 J	1.5 -	0.065 J
A3A-C03-13^1	0.822 J	0.653 J	0.71 J	0.653 J	13 -	0.827 U	0.28 J	1.3 -	0.048 J
A3A-C03-14^1	1.01 J	0.83 J	0.861 J	0.83 J	3.02 -	0.868 U	0.26 J	1.5 -	0.043 J
A3A-C03-15^1	0.658 J	0.76 J	0.776 J	0.76 J	3.51 -	0.811 U	0.21 J	1.2 -	0.036 J
Limit	1.7	1.8	1.7	1.5	82	30	82	2900	29000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	1.03	0.849	0.861	0.849	13	0.901 U	0.37	1.8	0.073
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3A-C04

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 5777

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum	Silver
A3A-C04-1^1	0.903 -	0.763 -	0.76 -	0.763 -	6.86 -	0.823 U	0.46 J	1.4 -	0.062 J
A3A-C04-3^1	1.02 -	0.811 -	0.912 -	0.811 -	8.17 -	0.834 U	0.45 J	0.76 J	0.062 J
A3A-C04-4^1	0.82 -	0.752 -	0.773 -	0.752 -	3.68 -	0.924 U	0.42 J	1.3 -	0.066 J
A3A-C04-6^1	0.804 -	0.721 -	0.746 -	0.721 -	3.41 -	0.785 U	0.44 J	0.97 J	0.06 J
A3A-C04-7^1	0.881 -	0.766 -	0.79 -	0.766 -	7.94 -	0.899 U	0.38 J	1.2 -	0.065 J
A3A-C04-8^1	0.893 -	0.777 -	0.77 -	0.777 -	7.44 -	0.876 U	0.39 J	1.1 -	0.057 J
A3A-C04-8^1-D	0.859 -	0.74 -	0.741 -	0.74 -	5.06 -	0.851 U	0.4 J	1.1 -	0.063 J
A3A-C04-9^1	0.933 -	0.888 -	0.909 -	0.888 -	--	0.832 U	0.38 J	1.5 -	0.073 J
A3A-C04-9A^1	--	--	--	--	23.7 -	--	--	--	--
A3A-C04-17^1 (duplicate for sub-CU 9)	--	--	--	--	3.34 J	--	--	--	--
A3A-C04-10^1	0.742 -	0.694 -	0.709 -	0.694 -	6.17 -	0.877 U	0.46 J	1.1 -	0.063 J
A3A-C04-12^1	0.761 -	0.567 -	0.566 -	0.567 -	2.04 UJ	0.818 U	0.39 J	1.5 -	0.063 J
A3A-C04-14^1	0.81 -	0.739 -	0.763 -	0.739 -	5.26 -	0.855 U	0.4 J	1.4 -	0.06 J
A3A-C04-15^1	0.806 -	0.623 -	0.636 -	0.623 -	--	0.795 U	0.39 J	1.5 -	0.061 J
A3A-C04-15A^1	--	--	--	--	6.3 -	--	--	--	--
A3A-C04-18^1 (duplicate for sub-CU 15)	--	--	--	--	5.31 -	--	--	--	--
A3A-C04-16^1	0.837 -	0.718 -	0.722 -	0.718 -	6.08 -	0.882 U	0.39 J	1.3 -	0.057 J
Limit	1.7	1.8	1.7	1.5	20	30	82	2900	29000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	1.02	0.888	0.912	0.888	23.7	0.924 U	0.46	1.5	0.073
Max. > Limit	No	No	No	No	Yes	No	No	No	No
W-statistic Prob. #	--	--	--	--	6.0% (LN)	--	--	--	--
Test Procedure	--	--	--	--	Lognormal	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	1	12	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	6.7%	100.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	6.78	--	--	--	--
UCL	--	--	--	--	10.09	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	pass	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	3	--	--	--	--
Size calculation	--	--	--	--	Pass	--	--	--	--

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.

CERTIFICATION UNIT A3A-C05

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Arsenic	Beryllium	Cadmium
A3A-C05-1^1	0.894 -	0.673 J	0.699 J	0.673 J	6.55 J	0.915 U	7.5 -	0.39 -	0.23 J
A3A-C05-2^1	0.831 -	0.605 J	0.578 J	0.605 J	4.96 J	1.09 U	3.9 -	0.5 -	0.23 J
A3A-C05-2^1-D	0.798 -	0.769 J	0.773 J	0.769 J	4.77 J	0.974 U	2.4 -	0.64 -	0.24 J
A3A-C05-3^1	0.811 -	0.651 J	0.657 J	0.651 J	2.67 J	0.906 U	6.4 -	0.59 -	0.25 J
A3A-C05-5^1	0.836 -	0.747 J	0.761 J	0.747 J	4.51 J	0.927 U	1.5 -	0.66 -	0.28 J
A3A-C05-6^1	0.861 -	0.851 J	0.872 J	0.851 J	5.46 J	0.917 U	4.6 -	0.38 -	0.26 J
A3A-C05-7^1	0.747 -	0.574 J	0.585 J	0.574 J	3.26 J	0.886 U	2.2 -	0.56 -	0.27 J
A3A-C05-10^1	0.822 -	0.69 J	0.704 J	0.69 J	4.5 J	0.975 U	6.5 -	0.52 -	0.27 J
A3A-C05-11^1	0.748 -	0.715 J	0.734 J	0.715 J	4.25 J	0.899 U	7.9 -	0.58 -	0.25 J
A3A-C05-12^1	0.883 -	0.697 J	0.72 J	0.697 J	3.44 J	0.933 U	1.8 -	0.5 -	0.23 J
A3A-C05-13^1	0.634 -	0.471 J	0.454 J	0.471 J	2.23 J	0.933 U	1.4 -	0.48 -	0.29 J
A3A-C05-14^1	0.858 -	0.766 J	0.755 J	0.766 J	4.01 J	0.917 U	6.7 -	0.72 -	0.34 J
A3A-C05-16^1	1.24 -	1.04 J	1.03 J	1.04 J	6.31 J	0.966 U	8.7 -	0.86 -	0.39 J
Limit	1.7	1.8	1.7	1.5	82	30	12	1.5	82
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	1.24	1.04	1.03	1.04	6.55	1.09 U	8.7	0.86	0.39
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--

<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--	--
---	----	----	----	----	----	----	----	----	----

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.

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CERTIFICATION UNIT A3A-C05

(cont.)

SAMPLEID	Molybdenum	Silver	Aroclor-1254	Aroclor-1260	1,1-Dichloroethene	1,2-Dichloroethene (Total)	Tetrachloroethene	Trichloroethene
A3A-C05-1^1	1.5 -	0.033 J	15 -	4.9 J	1.1 U	1.1 U	1.1 U	1.1 U
A3A-C05-2^1	1.6 -	0.038 J	3.6 U	3.6 U	0.5 J	0.8 U	0.8 U	0.8 U
A3A-C05-2^1-D	1.9 -	0.054 J	3.7 U	3.7 U	0.6 J	0.8 U	0.8 U	0.8 U
A3A-C05-3^1	1.2 -	0.047 J	3.5 U	3.5 U	1 U	1 U	1 U	1 U
A3A-C05-5^1	1.6 -	0.055 J	3.6 U	3.6 U	3.4 J	0.8 U	0.8 U	0.8 U
A3A-C05-6^1	2.6 -	0.046 J	3.7 U	3.7 U	0.9 U	0.9 U	0.9 U	0.9 U
A3A-C05-7^1	1.5 -	0.046 J	7 J	2.7 J	0.6 J	1 U	1 U	1 U
A3A-C05-10^1	1.5 -	0.04 J	3.5 U	3.5 U	5.1 J	1.1 U	1.1 U	1.1 U
A3A-C05-11^1	1.4 -	0.047 J	3.5 U	3.5 U	3.1 J	1 U	1 U	1 U
A3A-C05-12^1	1.3 -	0.041 J	3.3 U	3.3 U	1.2 J	1 U	1 U	1 U
A3A-C05-13^1	1.8 -	0.045 J	3.5 U	3.5 U	0.9 J	0.9 U	0.9 U	0.9 U
A3A-C05-14^1	1.5 -	0.048 J	3.7 U	3.7 U	1 U	1 U	0.8 J	1 U
A3A-C05-16^1	1.2 -	0.058 J	15.2 -	4 J	5.4 J	1 U	1 U	1 U
Limit	2900	29000	130	130	410	160	3600	25000
Units	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	2.6	0.058	15.2	4.9	5.4	1.1 U	0.8	1.1 U
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	9	9	4	12	11	0
% Nondetects	0.0%	0.0%	75.0%	75.0%	33.3%	100.0%	91.7%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3A-C06

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Beryllium	Cadmium	Molybdenum
A3A-C06-1^1	0.9 -	0.698 J	0.689 J	0.698 J	4.1 J	0.849 U	0.59 -	0.26 J	1.1 -
A3A-C06-3^1	0.753 -	0.559 J	0.558 J	0.559 J	2.57 J	0.845 U	0.45 -	0.23 J	1.6 -
A3A-C06-4^1	1.05 -	0.881 J	0.884 J	0.881 J	10.8 J	0.838 U	0.7 -	0.3 J	1.2 -
A3A-C06-5^1	1.13 -	1.02 J	1.05 J	1.02 J	13.3 J	0.913 U	0.79 -	0.45 J	1 -
A3A-C06-6^1	1.01 -	0.765 J	0.759 J	0.765 J	7.01 J	0.839 U	0.73 -	0.37 J	1.9 -
A3A-C06-8^1	1.23 -	1.13 J	1.16 J	1.13 J	13.7 J	0.875 U	0.77 -	0.34 J	1 -
A3A-C06-8^1-D	1.28 -	0.887 J	0.922 J	0.887 J	9.25 J	0.875 U	0.8 -	0.37 J	0.94 J
A3A-C06-9^1	1.09 -	1 J	1.04 J	1 J	20.1 J	0.883 U	0.68 -	0.45 J	1.3 -
A3A-C06-11^1	0.741 -	0.724 J	0.764 J	0.724 J	2.4 J	0.878 U	0.65 -	0.31 J	1.4 -
A3A-C06-12^1	0.997 -	0.804 J	0.817 J	0.804 J	13.4 J	4.1 -	0.73 -	0.3 J	1.3 -
A3A-C06-13^1	0.87 -	0.764 J	0.761 J	0.764 J	8.27 J	0.824 U	0.61 -	0.31 J	1.4 -
A3A-C06-14^1	0.833 -	0.679 J	0.702 J	0.679 J	4.76 J	1.28 -	0.58 -	0.25 J	1.3 -
A3A-C06-16^1	0.849 -	0.742 J	0.748 J	0.742 J	4.34 J	0.83 U	0.7 -	0.29 J	1.3 -
Limit	1.7	1.8	1.7	1.5	20	30	1.5	82	2900
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	1.28	1.13	1.16	1.13	20.1	4.1	0.8	0.45	1.9
Max. > Limit	No	No	No	No	Yes	No	No	No	No
W-statistic Prob. #	--	--	--	--	46.9% (LN)	--	--	--	--
Test Procedure	--	--	--	--	Lognormal	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	10	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	83.3%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	9.07	--	--	--	--
UCL	--	--	--	--	15.13	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	pass	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	5 Pass	--	--	--	--

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.

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CERTIFICATION UNIT A3A-C06

(cont.)

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SAMPLEID	Lead	Silver	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
A3A-C06-1^1	7.7 J	0.045 J	15 -	7.9 J	36 U	26 J	30 J
A3A-C06-3^1	7.1 J	0.039 J	3.5 U	3.5 U	35 U	35 U	35 U
A3A-C06-4^1	12.6 J	0.052 J	160 J	5.6 J	36 U	24 J	31 J
A3A-C06-5^1	16.3 J	0.085 J	81 -	14 -	240 -	210 -	300 -
A3A-C06-6^1	10.9 J	0.055 J	22 -	4.5 J	43 U	43 U	43 U
A3A-C06-8^1	8 J	0.083 J	68 J	13 -	36 U	36 UJ	23 J
A3A-C06-8^1-D	14.2 J	0.071 J	40 J	10 J	35 U	50 J	69 J
A3A-C06-9^1	15.6 J	0.069 J	13 -	4.3 J	36 U	31 J	59 J
A3A-C06-11^1	6.9 J	0.043 J	3.6 U	3.6 U	36 U	36 U	36 U
A3A-C06-12^1	8.3 J	0.046 J	1.2 J	3.6 U	36 U	36 U	36 U
A3A-C06-13^1	9.7 J	0.053 J	14 -	4.2 J	36 U	50 J	30 J
A3A-C06-14^1	8.1 J	0.038 J	3.4 J	1.2 J	35 U	35 U	20 J
A3A-C06-16^1	8.9 J	0.048 J	5.5 J	1.6 J	36 U	36 U	36 U
Limit	400	29000	130	130	20000	2000	20000
Units	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%
Max. Result	16.3	0.085	160	14	240	210	300
Max. > Limit	No	No	Yes	No	No	No	No
W-statistic Prob. #	--	--	53.8% (LN)	--	--	--	--
Test Procedure	--	--	Median (Sign)	--	--	--	--
Sample Size	12	12	12	12	12	12	12
Nondetects	0	0	2	3	11	6	5
% Nondetects	0.0%	0.0%	16.7%	25.0%	91.7%	50.0%	41.7%
Est. Mean*	--	--	13.50	--	--	--	--
UCL	--	--	22.00	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--
Pass / Fail	--	--	Pass	--	--	--	--

<i>a posteriori</i> Sample	--	--	5	--	--	--	--
Size calculation	--	--	Pass	--	--	--	--

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.

(cont.)

SAMPLEID	Benzo(k)fluoranthene	Benzo(g,h,l)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene
A3A-C06-1^1	20 J	21 J	36 U	18 U	30 J	36 U
A3A-C06-3^1	35 U	35 U	35 U	17 U	35 U	35 U
A3A-C06-4^1	36 U	36 U	30 J	18 U	53 J	36 U
A3A-C06-5^1	120 -	110 -	270 -	18 U	570 J	110 -
A3A-C06-6^1	43 U	43 U	43 U	21 U	43 U	43 U
A3A-C06-8^1	36 UJ	36 U	24 J	18 U	25 J	36 UJ
A3A-C06-8^1-D	29 J	35 U	63 J	18 U	78 J	24 J
A3A-C06-9^1	36 U	36 U	39 J	18 U	56 J	36 U
A3A-C06-11^1	36 U	36 U	36 U	18 U	36 U	36 U
A3A-C06-12^1	36 U	36 U	36 U	18 U	36 U	36 U
A3A-C06-13^1	30 J	23 J	63 J	18 U	97 J	22 J
A3A-C06-14^1	35 U	35 U	18 J	18 U	37 J	35 U
A3A-C06-16^1	36 U	36 U	36 U	18 U	36 U	36 U
Limit	200000	1000 (BTV)	2000000	2000	10000 (BTV)	20000
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%
Max. Result	120	110	270	21 U	570	110
Max. > Limit	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Nondetects	8	9	6	12	5	9
% Nondetects	66.7%	75.0%	50.0%	100.0%	41.7%	75.0%
Est. Mean*	--	--	--	--	--	--
UCL	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3A-C06

(cont.)

SAMPLEID	Phenanthrene	Pyrene	1,1-Dichloroethene	1,2-Dichloroethene (Total)	Tetrachloroethene	Trichloroethene
A3A-C06-1^1	36 U	30 J	3.8 J	1 U	1 U	1 U
A3A-C06-3^1	35 U	35 U	0.6 J	1 U	1 U	1 U
A3A-C06-4^1	23 J	41 J	1.8 J	1 U	1 U	1 U
A3A-C06-5^1	400 J	540 J	1.1 U	1.1 U	1.1 U	1.1 U
A3A-C06-6^1	43 U	43 U	1.1 J	1.7 U	1.7 U	1.7 U
A3A-C06-8^1	36 UJ	26 J	0.6 J	1.1 U	1.1 U	1.1 U
A3A-C06-8^1-D	34 J	79 J	1.2 U	1.2 U	1.2 U	1.2 U
A3A-C06-9^1	18 J	48 J	4.4 J	1.1 U	1.1 U	1.1 U
A3A-C06-11^1	36 U	36 U	4.1 J	1.1 U	1.1 U	1.1 U
A3A-C06-12^1	36 U	36 U	1.3 J	1.6 U	1.6 U	1.6 U
A3A-C06-13^1	37 J	98 J	1.3 J	1.1 U	1.1 U	1.1 U
A3A-C06-14^1	19 J	34 J	1.1 J	1.2 U	1.2 U	1.2 U
A3A-C06-16^1	36 U	36 U	1.1 J	0.9 U	0.9 U	0.9 U
Limit	5000 (BTV)	10000 (BTV)	410	160	3600	25000
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%
Max. Result	400	540	4.4	1.7 U	1.7 U	1.7 U
Max. > Limit	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Nondetects	6	5	1	12	12	12
% Nondetects	50.0%	41.7%	8.3%	100.0%	100.0%	100.0%
Est. Mean*	--	--	--	--	--	--
UCL	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--

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.

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SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum	Silver
A3A-C07-1^1	0.805 -	0.821 J	0.801 -	0.821 J	4.21 J	0.952 U	0.43 J	1.2 J	0.059 J
A3A-C07-2^1	0.858 -	0.706 J	0.721 -	0.706 J	16.1 J	0.951 U	0.55 J	1.5 J	0.081 J
A3A-C07-4^1	0.975 -	0.889 J	0.88 -	0.889 J	13.7 J	0.946 U	0.39 J	1.8 J	0.058 J
A3A-C07-6^1	0.821 -	0.777 J	0.756 -	0.777 J	1.75 U	0.953 U	0.42 J	1.5 J	0.052 J
A3A-C07-7^1	0.856 -	0.744 J	0.739 -	0.744 J	1.97 U	0.924 U	0.41 J	1.9 J	0.061 J
A3A-C07-8^1	1.36 -	1.07 J	1.08 -	1.07 J	10.5 J	0.932 U	0.45 J	1.4 J	0.078 J
A3A-C07-9^1	0.873 -	0.768 J	0.774 -	0.768 J	4.03 J	1.05 U	0.42 J	1.4 J	0.054 J
A3A-C07-11^1	0.893 -	0.685 J	0.681 -	0.685 J	2.88 J	0.895 U	0.49 J	2.2 J	0.068 J
A3A-C07-12^1	0.763 -	0.741 J	0.762 -	0.741 J	7.75 J	0.963 U	0.39 J	1.3 J	0.054 J
A3A-C07-13^1	0.916 -	0.835 J	0.914 -	0.835 J	8.6 J	0.969 U	0.39 J	1.7 J	0.048 J
A3A-C07-13^1-D	0.88 -	0.833 J	0.849 -	0.833 J	7.42 J	0.888 U	0.41 J	1.8 J	0.06 J
A3A-C07-14^1	0.711 -	0.943 J	1.1 -	0.943 J	6.35 J	0.968 U	0.42 J	1.4 J	0.055 J
A3A-C07-15^1	0.849 -	0.727 J	0.741 -	0.727 J	3.89 J	1.08 U	0.43 J	1.4 J	0.054 J
Limit	1.7	1.8	1.7	1.5	20	30	82	2900	29000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	1.36	1.07	1.1	1.07	16.1	1.08 U	0.55	2.2	0.081
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	2	12	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	16.7%	100.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--	--

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.

5777

CERTIFICATION UNIT A3A-C08

5777

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum	Silver
3ALTCBPSM-1	--	--	--	--	--	1.46 U	--	--	--
3ABPFGOR-4	0.948 -	0.76 -	0.759 -	0.76 -	3.53 -	--	--	--	--
3ABPFGOR-3	0.664 -	0.56 -	0.544 -	0.56 -	5.3 -	--	--	--	--
3ABPFGOR-2	0.869 -	0.722 -	0.723 -	0.722 -	4.12 -	--	--	--	--
3ABPFGOR-1	0.857 -	0.73 -	0.724 -	0.73 -	3.69 -	--	--	--	--
3ARBPSM-1	0.57 -	0.341 -	0.34 -	0.341 -	3.16 -	--	--	--	--
A3A-C08-1^1	0.68 J	0.522 -	0.543 J	0.522 -	8.61 J	1.06 U	0.52 -	1.3 -	0.073 J
A3A-C08-2^1	0.769 J	0.488 -	0.489 J	0.488 -	5.86 J	0.927 U	0.56 -	2 -	0.081 J
A3A-C08-3^1	0.661 J	0.394 -	0.389 J	0.394 -	2.15 J	0.859 U	0.49 J	0.89 J	0.066 J
A3A-C08-5^1	0.792 J	0.598 -	0.627 J	0.598 -	2.15 J	0.893 U	0.46 J	1.6 -	0.064 J
A3A-C08-8^1	0.679 J	0.501 -	0.515 J	0.501 -	2.85 J	0.912 U	0.48 J	1.5 -	0.064 J
A3A-C08-9^1	0.773 J	0.64 -	0.638 J	0.64 -	4.27 J	0.929 U	0.48 J	2.7 -	0.069 J
A3A-C08-11^1	0.747 J	0.516 -	0.528 J	0.516 -	2.51 J	0.986 U	0.45 J	1.4 -	0.065 J
A3A-C08-12^1	0.662 J	0.427 -	0.41 J	0.427 -	3.64 J	1.03 U	0.45 J	1.8 -	0.058 J
A3A-C08-12^1-D	0.626 J	0.484 -	0.505 J	0.484 -	2.36 J	0.926 U	0.37 J	1.1 -	0.042 J
A3A-C08-13^1	0.829 J	0.55 -	0.575 J	0.55 -	4.04 J	1.05 U	0.46 J	1.4 -	0.067 J
A3A-C08-14^1	0.714 J	0.473 -	0.459 J	0.473 -	2.9 J	0.918 U	0.42 J	1.9 -	0.06 J
A3A-C08-15^1	0.672 J	0.513 -	0.527 J	0.513 -	3.14 J	1.08 U	0.43 J	1.4 -	0.064 J
Limit	1.7	1.8	1.7	1.5	82	30	82	2900	29000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	0.948	0.76	0.759	0.76	8.61	1.46 U	0.56	2.7	0.081
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	16	16	16	16	16	12	11	11	11
Nondetects	0	0	0	0	0	12	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3A-C09

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99
A3A-C09-2^1	1.07 -	0.942 -	0.969 -	0.942 -	6.28 -	0.854 U
A3A-C09-3^1	0.753 -	0.688 -	0.694 -	0.688 -	4.22 -	0.837 U
A3A-C09-3^1-D	0.913 -	0.904 -	0.928 -	0.904 -	3.6 -	0.779 U
A3A-C09-4^1	0.925 -	0.7 -	0.693 -	0.7 -	5.15 -	0.814 U
A3A-C09-6^1	0.745 -	0.661 -	0.661 -	0.661 -	1.95 U	0.777 U
A3A-C09-7^1	0.979 -	0.788 -	0.804 -	0.788 -	5.31 -	0.816 U
A3A-C09-8^1	0.958 -	0.678 -	0.727 -	0.678 -	3.53 -	0.859 U
A3A-C09-9^1	0.855 -	0.691 -	0.663 -	0.691 -	3.11 -	0.854 U
A3A-C09-11^1	1.31 -	1.06 -	1.09 -	1.06 -	7.4 -	0.882 U
A3A-C09-12^1	0.836 -	0.746 -	0.776 -	0.746 -	8.76 -	0.799 U
A3A-C09-13^1	0.636 -	0.661 -	0.694 -	0.661 -	1.81 U	0.807 U
A3A-C09-14^1	0.794 -	0.721 -	0.743 -	0.721 -	2.74 -	0.785 U
A3A-C09-15^1	0.827 -	0.925 -	0.963 -	0.925 -	4.66 -	0.878 U
Limit	1.7	1.8	1.7	1.5	82	30
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g
Conf. Level	95%	95%	95%	95%	95%	90%
Max. Result	1.31	1.06	1.09	1.06	8.76	0.882 U
Max. > Limit	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Nondetects	0	0	0	0	2	12
% Nondetects	0.0%	0.0%	0.0%	0.0%	16.7%	100.0%
Est. Mean*	--	--	--	--	--	--
UCL	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3A-C09

A-5777

(cont.)

SAMPLEID	Arsenic	Beryllium	Cadmium	Molybdenum	Silver
A3A-C09-2^1	8.3 -	0.73 -	0.38 J	1.1 -	0.062 J
A3A-C09-3^1	5.7 -	0.55 -	0.27 J	1.4 -	0.042 J
A3A-C09-3^1-D	6.1 -	0.61 -	0.25 J	1.4 -	0.041 J
A3A-C09-4^1	6.3 -	0.64 -	0.32 J	1.1 -	0.051 J
A3A-C09-6^1	5.6 -	0.58 -	0.29 J	1.5 -	0.039 J
A3A-C09-7^1	7.1 -	0.76 -	0.35 J	1.6 -	0.06 J
A3A-C09-8^1	6.9 -	0.58 -	0.31 J	1.6 -	0.046 J
A3A-C09-9^1	7.3 -	0.55 -	0.36 J	1.4 -	0.051 J
A3A-C09-11^1	12 -	0.87 -	0.45 J	1.6 -	0.077 J
A3A-C09-12^1	5.9 -	0.45 -	0.3 J	1.2 -	0.045 J
A3A-C09-13^1	5.6 -	0.5 -	0.29 J	1.4 -	0.041 J
A3A-C09-14^1	6.1 -	0.56 -	0.38 J	1.6 -	0.045 J
A3A-C09-15^1	6.5 -	0.56 -	0.27 J	1.3 -	0.043 J
Limit	12	1.5	82	2900	29000
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Conf. Level	90%	90%	90%	90%	90%
Max. Result	12	0.87	0.45	1.6	0.077
Max. > Limit	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Nondetects	0	0	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--
UCL	--	--	--	--	--
Prob. > Limit	--	--	--	--	--
Pass / Fail	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--
Size calculation	--	--	--	--	--

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.

CERTIFICATION UNIT A3A-C10

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum	Silver
A3A-C10-2^1	0.86 -	0.71 -	0.697 -	0.71 -	6.02 -	0.87 U	0.28 J	3.6 J	0.059 J
A3A-C10-3^1	0.874 -	0.656 -	0.691 -	0.656 -	4.36 -	0.841 U	0.29 J	1.6 J	0.045 J
A3A-C10-4^1	0.695 -	0.558 -	0.543 -	0.558 -	6.17 -	0.813 U	0.28 J	1.8 J	0.048 J
A3A-C10-4^1-D	0.736 -	0.574 -	0.573 -	0.574 -	5.11 -	0.814 U	0.28 J	1.6 J	0.041 J
A3A-C10-5^1	0.845 -	0.917 -	0.915 -	0.917 -	13.4 -	0.795 U	0.38 J	1.3 J	0.064 J
A3A-C10-7^1	0.922 -	0.963 -	0.959 -	0.963 -	12.7 -	0.812 U	0.35 J	1.2 J	0.063 J
A3A-C10-8^1	1.14 -	0.922 -	0.951 -	0.922 -	11.2 -	0.803 U	0.32 J	1.5 J	0.054 J
A3A-C10-9^1	0.815 -	0.694 -	0.693 -	0.694 -	3.61 -	0.787 U	0.48 J	5.3 J	0.048 J
A3A-C10-10^1	0.825 -	0.568 -	0.536 -	0.568 -	8.63 -	0.81 U	0.35 J	1.2 J	0.056 J
A3A-C10-12^1	0.814 -	1 -	1.03 -	1 -	10.5 -	0.783 U	0.34 J	1.8 J	0.058 J
A3A-C10-13^1	0.933 -	0.852 -	0.869 -	0.852 -	13.9 -	0.761 U	0.35 J	1.3 J	0.058 J
A3A-C10-14^1	0.986 -	1.03 -	1.05 -	1.03 -	14.1 -	0.797 U	0.34 J	1.3 J	0.058 J
A3A-C10-16^1	1 -	1 -	1.01 -	1 -	11.5 -	0.788 U	0.34 J	1.3 J	0.059 J
Limit	1.7	1.8	1.7	1.5	82	30	82	2900	29000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	1.14	1.03	1.05	1.03	14.1	0.87 U	0.48	5.3	0.064
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3A-C11

44-5777

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum	Silver
A3A-C11-1^1	0.854 -	0.756 -	0.706 -	0.756 -	4.01 -	0.872 U	0.29 U	1.7 -	0.051 J
A3A-C11-3^1	0.904 -	0.71 -	0.709 -	0.71 -	5.89 -	0.827 U	0.29 U	1.5 -	0.046 J
A3A-C11-4^1	0.929 -	0.736 -	0.736 -	0.736 -	9.02 -	0.856 U	0.3 U	1.3 -	0.05 J
A3A-C11-5^1	0.804 -	0.661 -	0.653 -	0.661 -	4.76 -	0.814 U	0.25 U	1.3 -	0.048 J
A3A-C11-6^1	0.803 -	0.601 -	0.592 -	0.601 -	1.91 -	0.81 U	0.25 U	1.3 -	0.038 J
A3A-C11-6^1-D	0.87 -	0.798 -	0.823 -	0.798 -	5.23 -	0.803 U	0.31 J	1.5 -	0.045 J
A3A-C11-7^1	0.81 -	0.84 -	0.826 -	0.84 -	5.72 -	0.81 U	0.27 U	1.5 -	0.044 J
A3A-C11-9^1	0.951 -	0.756 -	0.738 -	0.756 -	4.41 -	0.807 U	0.26 U	1.2 -	0.039 J
A3A-C11-11^1	0.872 -	0.785 -	0.8 -	0.785 -	10.8 -	0.807 U	0.36 J	1.5 -	0.062 J
A3A-C11-12^1	0.955 -	0.904 -	0.898 -	0.904 -	12.9 -	0.801 U	0.33 J	1.4 -	0.056 J
A3A-C11-14^1	0.763 -	0.502 -	0.476 -	0.502 -	2.7 -	0.811 U	0.42 J	1.4 -	0.091 J
A3A-C11-15^1	0.847 -	0.85 -	0.899 -	0.85 -	13 -	4.38 -	0.37 J	1.4 -	0.061 J
A3A-C11-16^1	0.835 -	0.767 -	0.806 -	0.767 -	7.46 -	0.806 U	0.27 U	1 -	0.046 J
Limit	1.7	1.8	1.7	1.5	82	30	82	2900	29000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	0.955	0.904	0.899	0.904	13	4.38	0.42	1.7	0.091
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	11	7	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	91.7%	58.3%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--

<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--

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.

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum	Silver
A3A-C12-1^1	0.647 -	0.396 -	0.422 J	0.396 -	2.73 -	1.01 U	0.26 J	1.7 -	0.04 J
A3A-C12-2^1	0.62 -	0.407 -	0.409 J	0.407 -	1.63 U	1.02 U	0.34 J	1.2 -	0.052 J
A3A-C12-4^1	0.911 -	0.753 -	0.748 J	0.753 -	5.38 -	0.923 U	0.47 J	1.5 -	0.069 J
A3A-C12-5^1	0.68 -	0.498 -	0.491 J	0.498 -	2.89 -	0.844 U	0.35 J	3.1 -	0.055 J
A3A-C12-7^1	0.84 -	0.616 -	0.623 J	0.616 -	6.72 -	0.912 U	0.47 J	1.4 -	0.063 J
A3A-C12-8^1	0.782 -	0.602 -	0.708 J	0.602 -	6.05 -	0.872 U	0.39 J	1.4 -	0.057 J
A3A-C12-9^1	0.858 -	0.699 -	0.705 J	0.699 -	3.38 -	0.941 U	0.4 J	1.4 -	0.054 J
A3A-C12-9^1-D	0.887 -	0.723 -	0.726 J	0.723 -	3.6 -	0.867 U	0.4 J	1.7 -	0.062 J
A3A-C12-10^1	0.822 -	0.592 -	0.613 J	0.592 -	6.88 -	0.877 U	0.44 J	1.5 -	0.096 J
A3A-C12-12^1	0.727 -	0.606 -	0.607 J	0.606 -	3.5 -	0.876 U	0.37 J	1.3 -	0.056 J
A3A-C12-13^1	0.847 -	0.737 -	0.759 J	0.737 -	6.01 -	0.939 U	0.41 J	1.3 -	0.056 J
A3A-C12-14^1	0.816 -	0.79 -	0.828 J	0.79 -	6.91 -	0.841 U	0.47 J	1.3 -	0.066 J
A3A-C12-15^1	0.743 -	0.598 -	0.618 J	0.598 -	4.5 -	0.848 U	0.37 J	1.3 -	0.053 J
Limit	1.7	1.8	1.7	1.5	82	30	82	2900	29000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	0.911	0.79	0.828	0.79	6.91	1.02 U	0.47	3.1	0.096
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	1	12	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	8.3%	100.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3A-C12

(cont.)

SAMPLEID	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene
A3A-C12-1^1	34 U	34 U	34 U	34 U	34 U
A3A-C12-2^1	34 U	34 U	34 U	34 U	34 U
A3A-C12-4^1	240 -	49 -	34 J	36 U	36 U
A3A-C12-5^1	34 U	34 U	34 U	34 U	34 U
A3A-C12-7^1	35 U	35 U	35 U	35 U	35 U
A3A-C12-8^1	35 U	35 U	35 U	35 U	35 U
A3A-C12-9^1	36 U	36 U	36 U	36 U	36 U
A3A-C12-9^1-D	36 U	36 U	36 U	36 U	36 U
A3A-C12-10^1	1700 -	1400 -	2400 -	70 U	510 -
A3A-C12-12^1	35 U	35 U	35 U	35 U	35 U
A3A-C12-13^1	35 U	35 U	35 U	35 U	35 U
A3A-C12-14^1	36 U	36 U	36 U	36 U	36 U
A3A-C12-15^1	35 U	35 U	35 U	35 U	35 U
Limit	20000	2000	20000	200000	1000 (BTV)
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%
Max. Result	1700	1400	2400	70 U	510
Max. > Limit	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Nondetects	10	10	10	12	11
% Nondetects	83.3%	83.3%	83.3%	100.0%	91.7%
Est. Mean*	--	--	--	--	--
UCL	--	--	--	--	--
Prob. > Limit	--	--	--	--	--
Pass / Fail	--	--	--	--	--

<i>a posteriori</i> Sample	--	--	--	--	--
Size calculation	--	--	--	--	--

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.

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(cont.)

SAMPLEID	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
A3A-C12-1^1	34 U	17 U	27 J	34 U	34 U	26 J
A3A-C12-2^1	34 U	17 U	34 U	34 U	34 U	34 U
A3A-C12-4^1	240 -	18 U	410 -	200 -	160 -	300 -
A3A-C12-5^1	34 U	17 U	23 J	34 U	34 U	18 J
A3A-C12-7^1	35 U	18 U	38 -	35 U	24 J	31 J
A3A-C12-8^1	35 U	17 U	140 -	35 U	46 -	96 -
A3A-C12-9^1	36 U	18 U	36 U	36 U	36 U	36 U
A3A-C12-9^1-D	36 U	18 U	36 U	36 U	36 U	36 U
A3A-C12-10^1	1500 -	35 U	4400 -	640 -	3000 -	3200 -
A3A-C12-12^1	35 U	17 U	47 -	35 U	35 U	38 -
A3A-C12-13^1	46 -	17 U	30 J	35 U	35 U	22 J
A3A-C12-14^1	36 U	18 U	36 U	36 U	36 U	36 U
A3A-C12-15^1	35 U	17 U	35 U	35 U	35 U	35 U
Limit	2000000	2000	10000 (BTV)	20000	5000 (BTV)	10000 (BTV)
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%
Max. Result	1500	35 U	4400	640	3000	3200
Max. > Limit	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Nondetects	9	12	4	10	8	4
% Nondetects	75.0%	100.0%	33.3%	83.3%	66.7%	33.3%
Est. Mean*	--	--	--	--	--	--
UCL	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--

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.

5777

CERTIFICATION UNIT A3A-C13

5777

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum	Silver
A3A-C13-2^1	0.787 -	0.665 -	0.676 J	0.665 -	2.91 -	0.935 U	0.5 J	1.8 -	0.067 J
A3A-C13-3^1	1.19 -	1 -	1.01 J	1 -	10.2 -	0.838 U	0.63 -	1.3 -	0.089 J
A3A-C13-4^1	0.82 -	0.8 -	0.833 J	0.8 -	3.23 -	0.883 U	0.49 J	1.4 -	0.064 J
A3A-C13-5^1	0.821 -	0.751 -	0.794 J	0.751 -	9.12 -	0.922 U	0.58 -	1.3 -	0.07 J
A3A-C13-5^1-D	0.873 -	0.771 -	0.822 J	0.771 -	8 -	0.938 U	0.58 -	1.4 -	0.078 J
A3A-C13-6^1	0.958 -	0.749 -	0.768 J	0.749 -	23.7 -	0.891 U	0.59 -	1.2 -	0.084 J
A3A-C13-8^1	0.92 -	1.12 -	1.16 J	1.12 -	14.9 -	0.87 U	0.59 -	1.5 -	0.091 J
A3A-C13-10^1	0.83 -	0.788 -	0.79 J	0.788 -	4.97 -	0.903 U	0.56 -	1.5 -	0.077 J
A3A-C13-11^1	0.797 -	0.675 -	0.688 J	0.675 -	1.97 U	0.865 U	0.51 -	1.7 -	0.072 J
A3A-C13-12^1	0.846 -	0.672 -	0.697 J	0.672 -	4.82 -	0.872 U	0.51 -	1.6 -	0.068 J
A3A-C13-13^1	0.839 -	0.827 -	0.834 J	0.827 -	3.06 -	0.862 U	0.48 J	1.3 -	0.066 J
A3A-C13-14^1	0.759 -	0.766 -	0.779 J	0.766 -	3.78 -	0.91 U	0.58 -	1.2 -	0.08 J
A3A-C13-15^1	0.906 -	0.814 -	0.824 J	0.814 -	5.51 -	0.947 U	0.53 -	1.5 -	0.074 J
Limit	1.7	1.8	1.7	1.5	82	30	82	2900	29000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	1.19	1.12	1.16	1.12	23.7	0.947 U	0.63	1.8	0.091
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	1	12	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	8.3%	100.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--	--

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.

(cont.)

SAMPLEID	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene
A3A-C13-2^1	36 U	36 U	36 U	36 U	18 U
A3A-C13-3^1	36 U	36 U	36 U	36 U	18 U
A3A-C13-4^1	36 U	36 U	36 U	36 U	18 U
A3A-C13-5^1	100 J	73 J	140 J	35 U	31 J
A3A-C13-5^1-D	660 J	460 J	840 J	35 U	180 J
A3A-C13-6^1	36 U	130 -	240 -	36 U	47 J
A3A-C13-8^1	36 U	74 J	150 -	36 U	34 J
A3A-C13-10^1	36 U	36 U	36 U	36 U	18 U
A3A-C13-11^1	36 U	36 U	36 U	36 U	18 U
A3A-C13-12^1	35 U	35 U	35 U	35 U	18 U
A3A-C13-13^1	35 U	35 U	35 U	35 U	18 U
A3A-C13-14^1	36 U	36 U	36 U	36 U	18 U
A3A-C13-15^1	36 U	36 U	36 U	36 U	18 U
Limit	20000	2000	20000	200000	1000 (BTV)
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%
Max. Result	660	460	840	36 U	180
Max. > Limit	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Nondetects	11	9	9	12	9
% Nondetects	91.7%	75.0%	75.0%	100.0%	75.0%
Est. Mean*	--	--	--	--	--
UCL	--	--	--	--	--
Prob. > Limit	--	--	--	--	--
Pass / Fail	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--

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.

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CERTIFICATION UNIT A3A-C13

(cont.)

SAMPLEID	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
A3A-C13-2^1	36 U	18 U	36 U	36 U	36 U	36 U
A3A-C13-3^1	36 U	18 U	22 J	36 U	36 U	36 U
A3A-C13-4^1	36 U	18 U	36 U	36 U	36 U	36 U
A3A-C13-5^1	120 J	18 U	200 J	140 J	77 J	140 J
A3A-C13-5^1-D	640 J	18 U	1700 J	270 J	980 J	1200 J
A3A-C13-6^1	140 -	18 U	250 J	160 -	130 J	220 J
A3A-C13-8^1	79 J	18 U	130 J	140 -	62 J	100 J
A3A-C13-10^1	36 U	18 U	36 U	36 U	36 U	36 U
A3A-C13-11^1	36 U	18 U	36 U	36 U	36 U	36 U
A3A-C13-12^1	35 U	18 U	35 U	35 U	35 U	35 U
A3A-C13-13^1	35 U	18 U	35 U	35 U	35 U	35 U
A3A-C13-14^1	36 U	18 U	36 U	36 U	36 U	36 U
A3A-C13-15^1	36 U	18 U	36 U	36 U	36 U	36 U
Limit	2000000	2000	10000 (BTV)	20000	5000 (BTV)	10000 (BTV)
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%
Max. Result	640	18 U	1700	270	980	1200
Max. > Limit	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Nondetects	9	12	8	9	9	9
% Nondetects	75.0%	100.0%	66.7%	75.0%	75.0%	75.0%
Est. Mean*	--	--	--	--	--	--
UCL	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--

<i>a posteriori</i> Sample	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3A-C14

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum	Silver
A3A-C14-1^1	0.845 J	0.84 -	0.856 -	0.84 -	6.52 J	0.884 U	0.32 J	1.4 -	0.049 J
A3A-C14-2^1	0.781 J	0.749 -	0.747 -	0.749 -	12.8 J	0.852 U	0.4 J	1 -	0.05 J
A3A-C14-4^1	0.83 J	0.685 -	0.673 -	0.685 -	1.78 J	0.863 U	0.28 J	1.4 -	0.045 J
A3A-C14-6^1	0.826 J	0.635 -	0.643 -	0.635 -	6.79 J	0.87 U	0.27 J	2.3 -	0.047 J
A3A-C14-7^1	0.704 J	0.542 -	0.552 -	0.542 -	3.32 J	0.869 U	0.27 J	1.3 -	0.048 J
A3A-C14-8^1	0.764 J	0.592 -	0.595 -	0.592 -	2.76 J	0.859 U	0.25 J	1.4 -	0.046 J
A3A-C14-10^1	0.718 J	0.712 -	0.734 -	0.712 -	3.4 J	0.939 U	0.26 J	1.3 -	0.044 J
A3A-C14-11^1	0.778 J	0.77 -	0.764 -	0.77 -	7.19 J	0.918 U	0.29 J	1.2 -	0.046 J
A3A-C14-12^1	0.744 J	0.691 -	0.725 -	0.691 -	3.35 J	0.863 U	0.26 J	1.1 -	0.047 J
A3A-C14-13^1	0.646 J	0.551 -	0.569 -	0.551 -	4.97 J	0.869 U	0.24 J	1.5 -	0.038 J
A3A-C14-15^1	0.588 J	0.529 -	0.529 -	0.529 -	4.38 J	0.961 U	0.26 J	1.2 -	0.04 J
A3A-C14-15^1-D	0.737 J	0.554 -	0.564 -	0.554 -	4.04 J	0.911 U	0.25 J	1.6 -	0.06 J
A3A-C14-16^1	0.752 J	0.632 -	0.621 -	0.632 -	3.72 J	0.875 U	0.27 J	1.8 -	0.05 J
Limit	1.7	1.8	1.7	1.5	82	30	82	2900	29000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	0.845	0.84	0.856	0.84	12.8	0.961 U	0.4	2.3	0.06
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--	--

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.

5777

CERTIFICATION UNIT A3A-C15

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum	Silver
A3A-C15-2^1	0.976 -	0.92 -	0.942 J	0.92 -	7.05 -	0.896 U	0.26 J	1.3 -	0.047 U
A3A-C15-3^1	0.595 -	0.431 -	0.429 J	0.431 -	3.69 -	0.94 U	0.23 J	1.2 -	0.035 U
A3A-C15-5^1	0.785 -	0.612 -	0.631 J	0.612 -	6.88 -	0.827 U	0.26 J	1.3 -	0.05 U
A3A-C15-6^1	0.792 -	0.621 -	0.66 J	0.621 -	4.41 -	0.889 U	0.21 J	1.3 -	0.043 U
A3A-C15-7^1	--	--	--	--	--	--	0.4 J	1.5 -	0.083 J
A3A-C15-8^1	0.809 -	0.644 -	0.645 J	0.644 -	3.06 -	0.915 U	0.25 J	1.1 -	0.043 U
A3A-C15-9^1	0.81 -	0.712 -	0.722 J	0.712 -	2.68 -	0.866 U	0.26 J	1.5 -	0.046 U
A3A-C15-10^1	0.761 -	0.633 -	0.615 J	0.633 -	4.35 -	1.08 U	0.25 J	1.4 -	0.043 U
A3A-C15-12^1	0.688 -	0.52 -	0.526 J	0.52 -	5 -	0.942 U	0.21 J	1.3 -	0.039 U
A3A-C15-13^1	0.806 -	0.658 -	0.665 J	0.658 -	5.36 -	0.909 U	0.26 J	1.9 -	0.047 U
A3A-C15-13^1-D	0.768 -	0.694 -	0.708 J	0.694 -	7.42 -	0.986 U	0.52 -	1.3 -	0.049 U
A3A-C15-15^1	0.86 -	0.738 -	0.749 J	0.738 -	4.77 -	0.938 U	0.25 J	1.2 -	0.051 U
A3A-C15-16^1	0.774 -	0.693 -	0.72 J	0.693 -	4.23 -	0.911 U	0.34 J	1.2 -	0.045 U
Limit	1.7	1.8	1.7	1.5	82	30	82	2900	29000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	0.976	0.92	0.942	0.92	7.42	1.08 U	0.52	1.9	0.083
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	11	11	11	11	11	11	12	12	12
Nondetects	0	0	0	0	0	11	0	0	11
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	91.7%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--	--

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.

(cont.)

SAMPLEID	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
A3A-C15-2^1	3.5 U	3.5 U	35 U	35 U	35 U	35 U
A3A-C15-3^1	3.4 U	3.4 U	34 U	34 U	34 U	34 U
A3A-C15-5^1	1 J	3.5 U	35 U	31 J	22 J	35 U
A3A-C15-6^1	23 -	6.6 J	35 U	35 U	35 U	35 U
A3A-C15-7^1	13 -	3.5 J	56 U	56 UJ	56 UJ	86 J
A3A-C15-8^1	1.1 J	3.4 U	34 U	34 U	34 U	34 U
A3A-C15-9^1	1.7 J	3.5 U	35 U	35 U	35 U	35 U
A3A-C15-10^1	1.3 J	3.5 U	35 U	35 U	35 U	35 U
A3A-C15-12^1	3.5 U	3.5 U	35 U	35 U	35 U	35 U
A3A-C15-13^1	26 -	7.4 J	34 U	28 J	43 J	34 U
A3A-C15-13^1-D	33 -	13 -	35 U	45 J	55 J	24 J
A3A-C15-15^1	24 -	7.3 J	34 U	39 J	52 J	24 J
A3A-C15-16^1	2.4 J	1.1 J	34 U	34 U	34 U	34 U
Limit	130	130	20000	2000	20000	200000
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%
Max. Result	33	13	56 U	45	55	86
Max. > Limit	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Nondetects	3	7	12	9	9	9
% Nondetects	25.0%	58.3%	100.0%	75.0%	75.0%	75.0%
Est. Mean*	--	--	--	--	--	--
UCL	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3A-C15

(cont.)

SAMPLEID	Benzo(g,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene
A3A-C15-2^1	35 U	35 U	18 U	35 U	35 U
A3A-C15-3^1	34 U	34 U	17 U	34 U	34 U
A3A-C15-5^1	20 J	45 J	17 U	60 J	35 U
A3A-C15-6^1	35 U	35 U	17 U	35 U	35 U
A3A-C15-7^1	56 UJ	59 J	28 UJ	73 J	56 UJ
A3A-C15-8^1	34 U	34 U	17 U	34 U	34 U
A3A-C15-9^1	35 U	35 U	18 U	35 U	35 U
A3A-C15-10^1	35 U	35 U	18 U	35 U	35 U
A3A-C15-12^1	35 U	35 U	17 U	35 U	35 U
A3A-C15-13^1	34 U	36 J	17 U	50 J	34 U
A3A-C15-13^1-D	28 J	53 J	17 U	73 J	22 J
A3A-C15-15^1	25 J	54 J	17 U	73 J	19 J
A3A-C15-16^1	34 U	34 U	17 U	34 U	34 U
Limit	1000 (BTV)	2000000	2000	10000 (BTV)	20000
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%
Max. Result	28	59	28 UJ	73	22
Max. > Limit	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Nondetects	9	8	12	8	10
% Nondetects	75.0%	66.7%	100.0%	66.7%	83.3%
Est. Mean*	--	--	--	--	--
UCL	--	--	--	--	--
Prob. > Limit	--	--	--	--	--
Pass / Fail	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--

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.

CERTIFICATION UNIT A3A-C15

(cont.)

SAMPLEID	Phenanthrene	Pyrene	1,2-Dichloroethene (Total)
A3A-C15-2^1	35 U	35 U	1 UJ
A3A-C15-3^1	34 U	34 U	1.1 UJ
A3A-C15-5^1	33 J	61 J	1 UJ
A3A-C15-6^1	35 U	35 U	1 UJ
A3A-C15-7^1	35 J	73 J	1 U
A3A-C15-8^1	34 U	34 U	1.2 UJ
A3A-C15-9^1	35 U	35 U	1 UJ
A3A-C15-10^1	35 U	35 U	0.9 UJ
A3A-C15-12^1	35 U	35 U	0.9 UJ
A3A-C15-13^1	22 J	56 J	1.2 UJ
A3A-C15-13^1-D	32 J	68 J	1 UJ
A3A-C15-15^1	36 J	68 J	1.1 UJ
A3A-C15-16^1	34 U	34 U	1 UJ
Limit	5000 (BTV)	10000 (BTV)	160
Units	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%
Max. Result	36	73	1.2 UJ
Max. > Limit	No	No	No
W-statistic Prob. #	--	--	--
Test Procedure	--	--	--
Sample Size	12	12	12
Nondetects	8	8	12
% Nondetects	66.7%	66.7%	100.0%
Est. Mean*	--	--	--
UCL	--	--	--
Prob. > Limit	--	--	--
Pass / Fail	--	--	--
<i>a posteriori</i> Sample	--	--	--
Size calculation	--	--	--

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.

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CERTIFICATION UNIT A3A-C16

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum	Silver
A3A-C16-1^1	0.79 -	0.628 -	0.652 -	0.628 -	6.37 J	0.911 U	0.33 J	1.2 -	0.045 J
A3A-C16-2^1	0.745 -	0.654 -	0.663 -	0.654 -	4.82 J	0.922 U	0.41 J	1.4 -	0.053 J
A3A-C16-4^1	0.773 -	0.646 -	0.65 -	0.646 -	4.21 J	0.857 U	0.33 J	1.5 -	0.056 J
A3A-C16-5^1	0.677 -	0.599 -	0.597 -	0.599 -	3.39 J	0.905 U	0.33 J	1.4 -	0.051 J
A3A-C16-6^1	0.856 -	0.708 -	0.71 -	0.708 -	3.62 J	0.836 U	0.39 J	1.2 -	0.055 J
A3A-C16-8^1	0.706 -	0.619 -	0.645 -	0.619 -	5.33 J	0.906 U	0.34 J	1.2 -	0.053 J
A3A-C16-8^1-D	0.764 -	0.623 -	0.613 -	0.623 -	8.87 J	0.862 U	0.3 J	1.1 -	0.044 J
A3A-C16-10^1	0.607 -	0.516 -	0.54 -	0.516 -	5.99 J	0.902 U	0.35 J	1.3 -	0.055 J
A3A-C16-11^1	0.711 -	0.524 -	0.541 -	0.524 -	6.13 J	0.794 U	0.37 J	1.2 -	0.06 J
A3A-C16-12^1	0.773 -	0.674 -	0.66 -	0.674 -	1.83 J	0.902 U	0.37 J	1 -	0.05 J
A3A-C16-13^1	0.751 -	0.66 -	0.64 -	0.66 -	6.62 J	0.955 U	0.4 J	1.8 -	0.058 J
A3A-C16-15^1	0.741 -	0.668 -	0.675 -	0.668 -	8.92 J	0.908 U	0.41 J	1.3 -	0.07 J
A3A-C16-16^1	0.801 -	0.664 -	0.672 -	0.664 -	4.32 J	0.904 U	0.36 J	1.7 -	0.055 J
Limit	1.7	1.8	1.7	1.5	82	30	82	2900	29000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	0.856	0.708	0.71	0.708	8.92	0.955 U	0.41	1.8	0.07
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3A-C16

(cont.)

SAMPLEID	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene
A3A-C16-1^1	36 U	36 U	36 U	36 U	36 U
A3A-C16-2^1	34 U	34 U	34 U	34 U	34 U
A3A-C16-4^1	36 U	36 U	36 U	36 U	36 U
A3A-C16-5^1	34 U	34 U	34 U	34 U	34 U
A3A-C16-6^1	36 U	23 J	31 J	36 U	36 U
A3A-C16-8^1	36 U	36 U	18 J	36 U	36 U
A3A-C16-8^1-D	36 U	18 J	25 J	36 U	36 U
A3A-C16-10^1	36 U	36 U	36 U	36 U	36 U
A3A-C16-11^1	35 U	35 U	35 U	35 U	35 U
A3A-C16-12^1	35 U	20 J	35 U	35 U	35 U
A3A-C16-13^1	35 U	35 U	35 U	35 U	35 U
A3A-C16-15^1	36 U	47 -	70 -	36 U	28 J
A3A-C16-16^1	36 U	36 U	36 U	36 U	36 U
Limit	20000	2000	20000	200000	1000 (BTV)
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level.	90%	90%	90%	90%	90%
Max. Result	36 U	47	70	36 U	28
Max. > Limit	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Nondetects	12	8	9	12	11
% Nondetects	100.0%	66.7%	75.0%	100.0%	91.7%
Est. Mean*	--	--	--	--	--
UCL	--	--	--	--	--
Prob. > Limit	--	--	--	--	--
Pass / Fail	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--

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.

CERTIFICATION UNIT A3A-C16

(cont.)

SAMPLEID	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
A3A-C16-1^1	36 U	18 U	36 U	36 U	36 U	18 J
A3A-C16-2^1	34 U	17 U	34 U	34 U	34 U	34 U
A3A-C16-4^1	36 U	18 U	36 U	36 U	36 U	36 U
A3A-C16-5^1	34 U	17 U	34 U	34 U	34 U	34 U
A3A-C16-6^1	45 -	18 U	50 -	36 U	21 J	53 -
A3A-C16-8^1	18 J	18 U	32 J	36 U	36 U	27 J
A3A-C16-8^1-D	28 J	18 U	48 -	36 U	28 J	38 -
A3A-C16-10^1	36 U	18 U	36 U	36 U	36 U	36 U
A3A-C16-11^1	35 U	18 U	31 J	35 U	20 J	28 J
A3A-C16-12^1	32 J	18 U	59 -	35 U	22 J	55 -
A3A-C16-13^1	35 U	18 U	35 U	35 U	35 U	35 U
A3A-C16-15^1	71 -	18 U	120 -	24 J	60 -	110 -
A3A-C16-16^1	36 U	18 U	36 U	36 U	36 U	36 U
Limit	2000000	2000	10000 (BTV)	20000	5000 (BTV)	10000 (BTV)
Units	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%
Max. Result	71	18 U	120	24	60	110
Max. > Limit	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Nondetects	8	12	7	11	7	6
% Nondetects	66.7%	100.0%	58.3%	91.7%	58.3%	50.0%
Est. Mean*	--	--	--	--	--	--
UCL	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--

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.

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum	Silver
A3A-C17-1^1	1.29 J	0.922 J	0.883 -	0.922 J	5.91 -	0.797 U	0.62 -	0.81 J	0.092 J
A3A-C17-2^1	0.74 J	0.752 J	0.762 -	0.752 J	8.09 -	0.801 U	0.5 J	1.2 -	0.069 J
A3A-C17-4^1	0.937 J	0.76 J	0.807 -	0.76 J	5.26 -	0.76 U	0.51 -	1.8 -	0.068 J
A3A-C17-6^1	0.785 J	0.596 J	0.631 -	0.596 J	1.83 U	0.784 U	0.47 J	1.5 -	0.071 J
A3A-C17-7^1	0.838 J	0.717 J	0.725 -	0.717 J	4.31 -	0.841 U	0.44 J	1.3 -	0.064 J
A3A-C17-8^1	0.847 J	0.711 J	0.707 -	0.711 J	9.3 -	0.785 U	0.5 J	1.2 -	0.068 J
A3A-C17-9^1	0.763 J	0.655 J	0.666 -	0.655 J	5.67 -	0.891 U	0.52 -	1.5 -	0.077 J
A3A-C17-10^1	0.703 J	0.612 J	0.623 -	0.612 J	3.39 -	0.778 U	0.5 -	1.6 -	0.074 J
A3A-C17-12^1	0.827 J	0.787 J	0.803 -	0.787 J	4.71 -	0.809 U	0.46 J	1.1 -	0.066 J
A3A-C17-13^1	0.821 J	0.731 J	0.739 -	0.731 J	3.16 -	0.808 U	0.4 J	1.1 -	0.064 J
A3A-C17-15^1	0.88 J	0.776 J	0.792 -	0.776 J	4.58 -	0.767 U	0.4 J	1.2 -	0.062 J
A3A-C17-15^1-D	0.766 J	0.649 J	0.682 -	0.649 J	4.08 -	0.789 U	0.49 J	1.3 -	0.067 J
A3A-C17-16^1	1.15 J	0.814 J	0.839 -	0.814 J	5.87 -	0.743 U	0.44 J	1.2 -	0.066 J
Limit	1.7	1.8	1.7	1.5	20	30	82	2900	29000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	1.29	0.922	0.883	0.922	9.3	0.891 U	0.62	1.8	0.092
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	1	12	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	8.3%	100.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3A-C18

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Cadmium	Molybdenum	Silver
3ALTCP9C-2	--	--	--	--	--	2.12 -	--	--	--
3ALTCP9C-1	--	--	--	--	--	1.87 U	--	--	--
3ARP9C-1	0.828 -	0.56 -	0.566 -	0.56 -	5.71 -	--	--	--	--
3ARP9C-2	0.798 -	0.601 -	0.616 -	0.601 -	3.86 -	--	--	--	--
A3A-C18-1^1	0.765 J	0.65 J	0.666 J	0.65 J	7.67 J	0.921 U	0.28 J	1.1 -	0.05 J
A3A-C18-2^1	0.742 J	0.626 J	0.645 J	0.626 J	3.95 J	1.01 U	0.23 J	1.1 -	0.04 J
A3A-C18-4^1	0.869 J	0.57 J	0.575 J	0.57 J	3.33 J	0.933 U	0.28 J	1.4 -	0.051 J
A3A-C18-6^1	0.837 J	0.726 J	0.747 J	0.726 J	2.9 J	0.868 U	0.24 J	1.3 -	0.045 J
A3A-C18-7^1	0.726 J	0.734 J	0.751 J	0.734 J	3.97 J	0.996 U	0.25 J	1.1 -	0.044 J
A3A-C18-8^1	0.953 J	0.715 J	0.711 J	0.715 J	5.39 J	0.963 U	0.27 J	1.3 -	0.056 J
A3A-C18-9^1	1.04 J	1.02 J	1.02 J	1.02 J	6.29 J	0.972 U	0.26 J	1.2 -	0.051 J
A3A-C18-9^1-D	0.73 J	0.681 J	0.688 J	0.681 J	1.99 U	0.924 U	0.27 J	1.3 -	0.048 J
A3A-C18-10^1	0.765 J	0.7 J	0.712 J	0.7 J	4.47 J	1.02 U	0.29 J	1.5 -	0.054 J
A3A-C18-11^1	0.871 J	0.741 J	0.766 J	0.741 J	2.73 J	0.893 U	0.28 J	1.5 -	0.053 J
A3A-C18-13^1	0.858 J	0.646 J	0.693 J	0.646 J	5.01 J	0.979 U	0.26 J	1.5 -	0.05 J
Limit	1.7	1.8	1.7	1.5	20	30	82	2900	29000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	1.04	1.02	1.02	1.02	7.67	2.12	0.29	1.5	0.056
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	10	10	10
Nondetects	0	0	0	0	0	11	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	91.7%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3A-C19

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Barium	Mercury	Lead
A3A-C19-1^1	0.473 J	0.271 -	0.273 J	0.271 -	1.64 -	0.731 U	24.2 -	0.004 J	3.1 J
A3A-C19-2^1	0.467 J	0.25 -	0.253 J	0.25 -	1.79 -	0.696 U	13.7 -	0.0041 J	2.6 J
A3A-C19-3^1	0.423 J	0.213 -	0.21 J	0.213 -	1.53 -	0.75 U	16.9 -	0.0032 J	2.2 J
A3A-C19-4^1	0.428 J	0.238 -	0.249 J	0.238 -	1.22 -	0.764 U	17.1 -	0.0032 J	3 J
A3A-C19-5^1	0.396 J	0.192 -	0.205 J	0.192 -	3.5 -	0.669 U	21.8 -	0.0021 J	2.4 J
A3A-C19-6^1	0.766 J	0.687 -	0.666 J	0.687 -	3.93 -	0.755 U	78.4 -	0.011 J	7.9 J
A3A-C19-7^1	0.642 J	0.353 -	0.355 J	0.353 -	3.35 -	0.685 U	31.3 -	0.0071 J	4.1 J
A3A-C19-8^1	0.843 J	0.71 -	0.714 J	0.71 -	5.46 -	0.729 U	38.6 -	0.0095 J	6.9 J
Limit	1.7	1.8	1.7	1.5	82	30	68000	7.5	400
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%	90%
Max. Result	0.843	0.71	0.714	0.71	5.46	0.764 U	78.4	0.011	7.9
Max. > Limit	No	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--	--
Sample Size	8	8	8	8	8	8	8	8	8
Nondetects	0	0	0	0	0	8	0	0	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3A-C19

(cont.)

SAMPLEID	Benzene	Ethylbenzene	Toluene	Xylenes, Total
A3A-C19-1^1	1 U	1 U	1 U	1 J
A3A-C19-2^1	0.9 U	1.4 J	0.5 J	7.3 J
A3A-C19-3^1	1 U	1 U	1 U	1.5 J
A3A-C19-4^1	1 U	0.7 J	0.4 J	3.2 J
A3A-C19-5^1	1 U	1 U	1 U	1.1 J
A3A-C19-6^1	1 U	1.1 J	0.5 J	5.2 J
A3A-C19-7^1	0.9 U	0.8 J	0.5 J	3.7 J
A3A-C19-8^1	1 U	2 J	0.6 J	9.3 J
Limit	850000	5100000	100000000	920000000
Units	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%
Max. Result	1 U	2	0.6	9.3
Max. > Limit	No	No	No	No
W-statistic Prob. #	--	--	--	--
Test Procedure	--	--	--	--
Sample Size	8	8	8	8
Nondetects	8	3	3	0
% Nondetects	100.0%	37.5%	37.5%	0.0%
Est. Mean*	--	--	--	--
UCL	--	--	--	--
Prob. > Limit	--	--	--	--
Pass / Fail	--	--	--	--

<i>a posteriori</i> Sample	--	--	--	--
Size calculation	--	--	--	--

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.

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CERTIFICATION UNIT A3A-C20

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99
A3A-C20-1^1	0.858 -	0.727 -	0.725 -	0.727 -	4.49 -	0.962 U
A3A-C20-2^1	0.85 -	0.731 -	0.758 -	0.731 -	3.63 -	0.951 U
A3A-C20-3^1	0.798 -	0.722 -	0.732 -	0.722 -	5.55 -	0.966 U
A3A-C20-4^1	0.975 -	0.781 -	0.805 -	0.781 -	4.53 -	0.802 U
A3A-C20-5^1	0.881 -	0.718 -	0.741 -	0.718 -	3.22 -	0.812 U
A3A-C20-6^1	0.852 -	0.694 -	0.87 -	0.694 -	4.88 -	0.719 U
A3A-C20-7^1	0.819 -	0.614 -	0.627 -	0.614 -	3.56 -	0.866 U
A3A-C20-8^1	0.894 -	0.708 -	0.762 -	0.708 -	3.99 -	0.829 U
Limit	1.7	1.8	1.7	1.5	20	30
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g
Conf. Level	95%	95%	95%	95%	95%	90%
Max. Result	0.975	0.781	0.87	0.781	5.55	0.966 U
Max. > Limit	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	8	8	8	8	8	8
Nondetects	0	0	0	0	0	8
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Est. Mean*	--	--	--	--	--	--
UCL	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3B-C01

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C01-1^1	0.818 -	0.707 -	0.708 -	0.707 -	7.26 -	0.848 U	0.362 UJ	68.6 J
A3B-C01-2^1	0.896 -	0.821 -	0.868 -	0.821 -	10.5 -	0.849 U	0.369 UJ	66.4 J
A3B-C01-2^1-D	0.958 -	0.725 -	0.753 -	0.725 -	9.07 -	0.822 U	0.369 UJ	64.1 J
A3B-C01-3^1	0.864 -	0.597 -	0.59 -	0.597 -	5.72 -	0.975 U	0.379 UJ	50.8 J
A3B-C01-5^1	0.777 -	0.752 -	0.717 -	0.752 -	3.81 -	0.964 U	0.366 UJ	62.7 J
A3B-C01-6^1	0.859 -	0.658 -	0.664 -	0.658 -	2.71 -	0.764 U	0.35 UJ	39.6 J
A3B-C01-8^1	0.89 -	0.718 -	0.734 -	0.718 -	6.18 -	0.91 U	0.363 UJ	44.8 J
A3B-C01-10^1	0.844 -	0.629 -	0.656 -	0.629 -	5.54 -	0.919 U	0.372 UJ	56.6 J
A3B-C01-11^1	0.937 -	0.872 -	0.885 -	0.872 -	3.35 -	0.922 U	0.363 UJ	50.5 J
A3B-C01-12^1	0.715 -	0.477 -	0.499 -	0.477 -	3.23 -	0.846 U	0.353 UJ	41.7 J
A3B-C01-14^1	0.754 -	0.569 -	0.582 -	0.569 -	7.9 -	0.989 U	0.4 J	35.7 J
A3B-C01-15^1	0.773 -	0.626 -	0.626 -	0.626 -	5.28 -	0.866 U	0.36 UJ	48.2 J
A3B-C01-16^1	0.818 -	0.563 -	0.591 -	0.563 -	2.8 -	0.924 U	0.359 UJ	50.2 J
Limit	1.7	1.8	1.7	1.5	20	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	0.958	0.872	0.885	0.872	10.5	0.989 U	0.4	68.6
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	11	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	91.7%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

(cont.)

SAMPLEID	Cadmium	Molybdenum	Lead	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C01-1^1	0.3 J	1.4 J	8.6 J	0.05 J	1 U	4.9 U	1 U	2.2 J
A3B-C01-2^1	0.27 J	1.4 J	8.6 J	0.045 J	1 U	5.2 U	1 U	6.1 J
A3B-C01-2^1-D	0.3 J	1.4 J	9.6 J	0.046 J	1 U	4.7 U	1 U	3.6 J
A3B-C01-3^1	0.23 J	1.5 J	8.2 J	0.029 J	0.9 U	4.4 U	0.9 U	2.6 J
A3B-C01-5^1	0.25 J	1.5 J	7.2 J	0.037 J	1 U	4.9 U	1 U	7.5 J
A3B-C01-6^1	0.21 J	1 J	6 J	0.024 J	0.9 U	4.4 U	0.9 U	1.9 J
A3B-C01-8^1	0.23 J	1.3 J	6.6 J	0.037 J	1.3 U	6.6 U	1.3 U	2.2 J
A3B-C01-10^1	0.24 J	1.8 J	7.5 J	0.041 J	1 U	4.8 U	1 U	2.6 J
A3B-C01-11^1	0.22 J	1.6 J	6.6 J	0.056 J	1 U	4.9 U	1 UJ	2.3 J
A3B-C01-12^1	0.24 J	1.4 J	6.4 J	0.041 J	1 U	4.8 U	1 U	4.9 J
A3B-C01-14^1	0.2 J	1.3 J	5.4 J	0.038 J	1 U	5.1 U	1 UJ	5.1 J
A3B-C01-15^1	0.22 J	1.2 J	5.6 J	0.036 J	0.8 U	4.1 U	0.8 U	6.5 J
A3B-C01-16^1	0.19 J	1.2 J	6.1 J	0.038 J	0.9 U	4.4 U	0.9 U	28 J
Limit	82	2900	400	29000	4300	37000	3600	92000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	0.3	1.8	9.6	0.056	1.3 U	6.6 U	1.3 U	28
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	12	12	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3B-C02

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C02-1^1	0.865 J	0.685 J	0.712 J	0.685 J	6.04 -	0.591 U	0.4 U	48.5 J
A3B-C02-3^4	0.795 J	0.711 J	0.756 J	0.711 J	5.21 -	0.614 U	0.63 U	63.2 J
A3B-C02-4^1	0.837 J	0.647 J	0.673 J	0.647 J	1.96 -	0.66 U	0.5 U	123 J
A3B-C02-6^3	0.84 J	0.557 J	0.591 J	0.557 J	4.76 -	0.641 U	0.363 UJ	56.9 J
A3B-C02-7^3	0.927 J	0.563 J	0.575 J	0.563 J	3.39 -	0.67 U	0.371 UJ	67.4 J
A3B-C02-7^3-D	0.945 J	0.662 J	0.679 J	0.662 J	5.59 -	0.617 U	0.36 UJ	59 J
A3B-C02-8^1	1.03 J	0.576 J	0.576 J	0.576 J	5.24 -	0.657 U	0.357 UJ	56.4 J
A3B-C02-10^4	1.06 J	0.828 J	0.843 J	0.828 J	5.59 -	0.774 U	0.403 UJ	89 J
A3B-C02-11^1	1.28 J	0.893 J	0.94 J	0.893 J	3.17 -	0.7 U	0.42 U	147 J
A3B-C02-12^1	1.55 J	1.41 J	1.48 J	1.41 J	6 -	0.706 U	0.64 U	172 J
A3B-C02-14^6	0.937 J	0.635 J	0.643 J	0.635 J	4.32 -	0.605 U	0.38 UJ	58.7 J
A3B-C02-14^11	0.978 J	0.797 J	0.796 J	0.797 J	5.43 -	0.691 U	0.391 UJ	102 J
A3B-C02-15^1	0.974 J	0.825 J	0.822 J	0.825 J	3.33 -	0.696 U	0.374 UJ	82.6 J
A3B-C02-16^1	0.943 J	0.815 J	0.834 J	0.815 J	3.59 -	0.685 U	0.73 U	82 J
Limit	1.7	1.8	1.7	1.5	82	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.55	1.41	1.48	1.41	6.04	0.774 U	0.73 U	172
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	13	13	13	13	13	13	13	13
Nondetects	0	0	0	0	0	13	13	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

(cont.)

SAMPLEID	Cadmium	Molybdenum	Lead	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C02-1^1	0.24 J	1.2 -	8.2 J	0.042 J	0.9 U	4.4 U	0.9 U	8.8 J
A3B-C02-3^4	0.23 J	0.94 J	7.1 J	0.036 J	0.9 U	4.4 U	0.9 U	5.2 J
A3B-C02-4^1	0.28 J	1.5 -	10 J	0.046 J	0.9 U	4.3 U	0.9 U	19 J
A3B-C02-6^3	0.29 J	1.1 -	8.5 J	0.048 J	0.9 U	4.6 U	0.9 U	3.2 J
A3B-C02-7^3	0.25 J	1.3 -	8.2 J	0.049 J	1 U	4.8 U	1 U	6.1 J
A3B-C02-7^3-D	0.26 J	1.8 -	8.3 J	0.044 J	0.9 U	4.4 U	0.9 U	4.7 J
A3B-C02-8^1	0.33 J	3.8 -	9.9 J	0.069 J	1.2 U	6 U	1.2 U	9.6 J
A3B-C02-10^4	0.44 J	0.85 J	12 J	0.08 J	0.9 U	4.5 U	0.9 U	1 J
A3B-C02-11^1	0.4 J	1.2 -	14.5 J	0.055 J	1 U	4.8 U	1 U	2.6 J
A3B-C02-12^1	0.46 J	0.78 J	18.9 J	0.072 J	1.1 U	5.4 U	1.1 U	2.8 J
A3B-C02-14^6	0.24 J	0.96 J	8.9 J	0.037 J	1 U	4.7 U	1 U	4.2 J
A3B-C02-14^11	0.38 J	1.5 -	12.8 J	0.066 J	0.9 U	4.6 U	0.9 U	1.3 J
A3B-C02-15^1	0.36 J	1.1 -	11.1 J	0.048 J	1 U	5 U	1 U	4.1 J
A3B-C02-16^1	0.34 J	1.1 -	10.4 J	0.041 J	1.1 U	5.5 U	1.1 U	5.6 J
Limit	82	2900	400	29000	4300	37000	3600	920000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	0.46	3.8	18.9	0.08	1.2 U	6 U	1.2 U	19
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	13	13	13	13	13	13	13	13
Nondetects	0	0	0	0	13	13	13	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3B-C03

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C03-1^1	1.18 -	0.92 J	0.93 J	0.92 J	4.24 J	0.792 U	0.63 U	126 J
A3B-C03-3^5	1.63 -	1.29 J	1.29 J	1.29 J	6.31 -	0.831 U	0.48 U	255 J
A3B-C03-4^6	1.18 -	0.842 J	0.952 J	0.842 J	4.21 -	0.791 U	0.423 U	169 J
A3B-C03-6^8	1.6 -	1.1 J	1.09 J	1.1 J	4.09 -	0.785 U	2 U	183 J
A3B-C03-7^8	1.11 -	0.873 J	0.886 J	0.873 J	3.62 -	0.775 U	0.416 U	55.7 J
A3B-C03-8^9	1.04 -	0.804 J	0.815 J	0.804 J	2.7 -	0.798 U	0.422 U	82.9 J
A3B-C03-9^1	1.47 -	1.09 J	1.28 J	1.09 J	6.72 -	0.799 U	1.1 U	155 J
A3B-C03-10^6	1.15 -	1.05 J	1.04 J	1.05 J	5.32 -	0.803 U	0.423 U	94.5 J
A3B-C03-12^1	1.47 -	1.14 J	1.13 J	1.14 J	7.3 -	0.801 U	1.5 U	178 J
A3B-C03-14^4	1.42 -	1.1 J	1.1 J	1.1 J	5.39 -	0.845 U	0.426 U	168 J
A3B-C03-15^7	0.967 -	0.645 J	0.658 J	0.645 J	3.21 -	0.806 U	0.88 U	75.1 J
A3B-C03-15^7-D	0.882 -	0.781 J	0.813 J	0.781 J	3.39 -	0.767 U	0.425 U	76.1 J
A3B-C03-16^1	1.21 -	0.956 J	0.977 J	0.956 J	3.75 J	0.787 U	1 U	62.2 J
Limit	1.7	1.8	1.7	1.5	82	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.63	1.29	1.29	1.29	7.3	0.845 U	2 U	255
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

(cont.)

SAMPLEID	Cadmium	Molybdenum	Lead	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C03-1^1	0.5 -	0.74 J	14.6 J	0.079 J	1.1 U	5.6 U	1.1 U	10 J
A3B-C03-3^5	0.79 -	3.2 -	11.8 J	0.15 J	1 U	4.9 U	1 U	0.8 J
A3B-C03-4^6	0.35 J	0.69 J	10.9 J	0.075 J	1.1 U	5.6 U	1.1 U	4.7 J
A3B-C03-6^8	0.68 -	2.4 -	22.9 J	0.11 J	1.1 U	5.6 U	1.1 U	2.8 J
A3B-C03-7^8	0.4 J	1.2 -	5.5 J	0.058 J	1.1 U	5.5 U	1.1 U	5.6 J
A3B-C03-8^9	0.45 J	1.8 -	6.4 J	0.064 J	1 U	4.8 U	1 U	1 J
A3B-C03-9^1	0.78 -	1.4 -	17.5 J	0.11 J	1 U	5.2 U	1 U	0.8 J
A3B-C03-10^6	0.52 -	1.5 -	10.5 J	0.094 J	1 U	5.2 U	1 U	4 J
A3B-C03-12^1	1.4 -	4.6 -	12.4 J	0.13 J	1.1 U	5.3 U	1.1 U	2.8 J
A3B-C03-14^4	0.69 -	1.7 -	16 J	0.12 J	1.1 U	5.5 U	1.1 U	3.3 J
A3B-C03-15^7	0.52 -	2 J	8.1 J	0.067 J	1 U	5.3 U	1 U	11 J
A3B-C03-15^7-D	0.37 U	1.3 J	7.3 J	0.04 J	1.1 U	5.7 U	1.1 U	1.1 U
A3B-C03-16^1	0.46 J	1.5 -	7.3 J	0.063 J	1 U	1.9 J	1 U	2.3 J
Limit	82	2900	400	29000	4300	37000	3600	92000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	1.4	4.6	22.9	0.15	1.1 U	1.9	1.1 U	11
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	12	11	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	100.0%	91.7%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

1416

CERTIFICATION UNIT A3B-C04

5777

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C04-1^1	1.13 -	0.977 -	0.983 -	0.977 -	5.67 -	0.808 U	0.391 U	82.5 J
A3B-C04-2^1	1.01 -	0.798 -	0.803 -	0.798 -	4.62 -	0.84 U	0.388 U	96.7 J
A3B-C04-3^1	1.36 -	1.18 -	1.15 -	1.18 -	7.96 -	0.869 U	0.398 U	188 J
A3B-C04-5^1	1.14 -	0.888 -	0.892 -	0.888 -	6.8 -	0.808 U	0.39 U	105 J
A3B-C04-6^1	1.11 -	1.01 -	1.02 -	1.01 -	5.72 -	0.833 U	0.381 U	91.3 J
A3B-C04-8^8	1.53 -	1.29 -	1.33 -	1.29 -	4.16 -	0.841 U	0.423 U	154 J
A3B-C04-10^7	1.03 -	0.787 -	1.15 -	0.787 -	5.79 -	0.721 U	0.398 U	78.7 J
A3B-C04-11^4	1.15 -	1.14 -	1.16 -	1.14 -	4.45 -	0.802 U	0.401 U	107 J
A3B-C04-11^4-D	1.18 -	1.07 -	1.09 -	1.07 -	4.31 -	0.82 U	0.412 U	107 J
A3B-C04-12^6	1.29 -	1.03 -	1.04 -	1.03 -	7.36 -	0.828 U	0.421 U	91 J
A3B-C04-14^5	0.688 -	0.395 -	0.387 -	0.395 -	2.4 -	0.785 U	0.54 U	46.8 J
A3B-C04-15^1	0.633 -	0.413 -	0.408 -	0.413 -	4.01 -	0.82 U	0.36 U	39.6 J
A3B-C04-16^1	0.716 -	0.551 -	0.586 -	0.551 -	3.53 -	0.815 U	0.368 U	49.5 J
Limit	1.7	1.8	1.7	1.5	82	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.53	1.29	1.33	1.29	7.96	0.869 U	0.54 U	188
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

(cont.)

SAMPLEID	Cadmium	Molybdenum	Lead	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C04-1^1	0.52 -	0.71 J	9.3 J	0.087 J	0.9 U	4.5 U	0.9 U	2.6 J
A3B-C04-2^1	0.42 J	1.2 -	9.9 J	0.054 J	0.9 U	4.4 U	0.9 U	3.5 J
A3B-C04-3^1	0.65 -	0.69 J	17.6 J	0.13 J	1 U	4.9 U	1 U	3.7 J
A3B-C04-5^1	0.5 -	1.1 -	9.8 J	0.079 J	0.9 U	4.3 U	0.9 U	1.4 J
A3B-C04-6^1	0.54 -	0.96 J	11.7 J	0.079 J	0.9 U	4.6 U	0.9 U	1.8 J
A3B-C04-8^8	0.67 -	1.2 -	18.4 J	0.096 J	1 U	4.9 U	1 U	1 J
A3B-C04-10^7	0.49 J	0.81 J	9.9 J	0.076 J	0.9 U	4.6 U	0.9 U	1 J
A3B-C04-11^4	0.47 J	1.2 J	12.2 J	0.081 J	1.2 U	6.1 U	1.2 U	1.2 J
A3B-C04-11^4-D	0.47 J	0.78 J	12.9 J	0.071 J	1.2 U	6.2 U	1.2 U	1 J
A3B-C04-12^6	0.6 -	0.98 J	21 J	0.11 J	1.4 U	7.1 U	1.4 U	1 J
A3B-C04-14^5	0.34 J	2.6 -	7 J	0.041 J	0.9 U	1.4 J	0.9 U	1.4 J
A3B-C04-15^1	0.36 J	1.6 -	6.6 J	0.043 J	0.8 U	1.1 J	0.8 U	8.4 J
A3B-C04-16^1	0.4 J	1.7 -	6.2 J	0.051 J	0.9 U	4.5 U	0.9 U	2.2 J
Limit	82	2900	400	29000	4300	37000	3600	92000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	0.67	2.6	21	0.13	1.4 U	1.4	1.4 U	8.4
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	12	10	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	100.0%	83.3%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

11/19/97

CERTIFICATION UNIT A3B-C05

5777

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C05-1^1	1.16 J	0.901 J	0.943 J	0.901 J	6.02 -	0.886 U	0.388 UJ	92.8 J
A3B-C05-3^1	0.964 J	0.804 J	0.824 J	0.804 J	4.32 -	0.843 U	0.397 UJ	58.7 J
A3B-C05-4^1	1.33 J	1.17 J	1.16 J	1.17 J	9.42 -	0.861 U	0.442 UJ	83.5 J
A3B-C05-6^1	0.986 J	0.722 J	0.749 J	0.722 J	13.7 -	0.795 U	0.388 UJ	70.4 J
A3B-C05-7^1	0.998 J	0.987 J	0.989 J	0.987 J	2 UJ	0.84 U	0.381 UJ	63.9 J
A3B-C05-8^1	0.851 -	0.665 -	0.663 -	0.665 -	3.37 J	0.816 U	0.417 UJ	108 J
A3B-C05-9^4	1.09 J	0.924 J	0.945 J	0.924 J	4.96 -	0.857 U	0.395 UJ	77 J
A3B-C05-10^1	1.38 J	1.14 J	1.2 J	1.14 J	6.03 -	0.788 U	0.397 UJ	86 J
A3B-C05-12^1	0.924 J	0.835 J	0.867 J	0.835 J	9.39 -	0.868 U	0.38 UJ	104 J
A3B-C05-13^1	0.946 J	0.679 J	0.683 J	0.679 J	6.94 -	0.828 U	0.392 UJ	64.3 J
A3B-C05-14^1	0.984 J	0.821 J	0.838 J	0.821 J	3.41 -	0.825 U	0.411 UJ	76.5 J
A3B-C05-14^1-D	0.659 J	0.661 J	0.679 J	0.661 J	3.19 -	0.842 U	0.404 UJ	71.9 J
A3B-C05-15^1	1.14 J	0.866 J	0.847 J	0.866 J	10.6 -	0.866 U	0.389 UJ	78.6 J
Limit	1.7	1.8	1.7	1.5	82	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.38	1.17	1.2	1.17	13.7	0.886 U	0.442 UJ	108
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	1	12	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	8.3%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--

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.

(cont.)

SAMPLEID	Cadmium	Molybdenum	Lead	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C05-1^1	0.46 J	2.1 -	17.5 J	0.067 J	0.9 U	4.6 U	0.9 U	0.9 U
A3B-C05-3^1	0.43 J	2 -	13.8 J	0.068 J	0.9 U	4.7 U	0.9 U	0.9 U
A3B-C05-4^1	0.34 J	1.3 -	15.4 J	0.058 J	1.2 U	6 U	1.2 U	3.5 J
A3B-C05-6^1	0.36 J	1.7 -	9.7 J	0.052 J	0.9 U	4.3 U	0.9 U	3.4 J
A3B-C05-7^1	0.29 J	0.94 J	11.4 J	0.055 J	0.9 U	4.6 U	0.9 U	2.4 J
A3B-C05-8^1	0.37 J	1.6 -	11.4 J	0.063 J	0.8 U	4.2 U	0.8 U	0.8 U
A3B-C05-9^4	0.17 J	1.2 -	9.3 J	0.026 J	0.9 U	4.6 U	0.9 U	0.9 U
A3B-C05-10^1	0.35 J	0.72 J	8 J	0.055 J	0.9 U	4.4 U	0.9 U	1.2 J
A3B-C05-12^1	0.33 J	0.84 J	12.7 J	0.06 J	0.9 U	4.5 U	0.9 U	0.8 J
A3B-C05-13^1	0.32 J	1.1 -	8.7 J	0.051 J	0.9 U	4.2 U	0.9 U	4.6 J
A3B-C05-14^1	0.33 J	0.99 J	9.4 J	0.051 J	1.2 U	1.9 J	1.2 U	3.4 J
A3B-C05-14^1-D	0.34 J	1.2 -	9.8 J	0.054 J	1.4 U	7 U	1.4 U	4.2 J
A3B-C05-15^1	0.34 J	1.1 -	10.7 J	0.061 J	1 U	4.7 U	1 U	0.9 J
Limit	82	2900	400	29000	4300	37000	3600	920000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	0.46	2.1	17.5	0.068	1.4 U	1.9	1.4 U	4.6
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	12	11	12	4
% Nondetects	0.0%	0.0%	0.0%	0.0%	100.0%	91.7%	100.0%	33.3%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

5777

CERTIFICATION UNIT A3B-C06

15777

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C06-1^1	0.832 J	0.665 -	0.667 -	0.665 -	4.33 J	0.651 U	0.373 UJ	63.7 J
A3B-C06-2^1	0.89 J	0.782 -	0.806 -	0.782 -	6.09 J	0.76 U	0.382 UJ	62.1 J
A3B-C06-4^1	0.918 J	0.65 -	0.699 -	0.65 -	7.35 J	0.793 U	0.376 UJ	60.9 J
A3B-C06-4^1-D	0.696 J	0.614 -	0.609 -	0.614 -	4.59 J	0.676 U	0.372 UJ	63.7 J
A3B-C06-5^1	1.04 J	1.01 -	1.03 -	1.01 -	10.3 J	0.663 U	0.72 U	90.9 J
A3B-C06-6^1	1.03 J	0.684 -	0.704 -	0.684 -	8.87 J	0.671 U	0.41 U	60.8 J
A3B-C06-7^1	0.783 J	0.691 -	0.702 -	0.691 -	3.74 J	0.701 U	0.371 UJ	48.7 J
A3B-C06-9^1	0.895 J	0.702 -	0.701 -	0.702 -	5.48 J	0.752 U	0.7 U	60.7 J
A3B-C06-10^1	0.933 J	0.826 -	0.843 -	0.826 -	14.7 J	0.653 U	0.362 UJ	93.3 J
A3B-C06-12^1	1.28 J	1.02 -	1.01 -	1.02 -	5.76 J	0.675 U	0.399 UJ	133 J
A3B-C06-14^1	1.06 J	0.818 -	0.834 -	0.818 -	10.4 J	0.711 U	0.53 U	81 J
A3B-C06-15^1	1.08 J	0.918 -	0.916 -	0.918 -	9.24 J	0.705 U	0.45 U	95.3 J
A3B-C06-16^1	1.33 J	1.07 -	1.09 -	1.07 -	18.9 J	0.738 U	0.56 U	134 J
Limit	1.7	1.8	1.7	1.5	20	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.33	1.07	1.09	1.07	18.9	0.793 U	0.72 U	134
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--

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.

(cont.)

SAMPLEID	Cadmium	Molybdenum	Lead	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C06-1^1	0.37 J	2 J	9.5 J	0.062 J	0.9 UJ	4.6 UJ	0.9 UJ	1.5 J
A3B-C06-2^1	0.29 J	1.3 J	8.8 J	0.041 J	0.9 UJ	4.4 UJ	0.9 UJ	1.6 J
A3B-C06-4^1	0.3 J	1.2 J	8.2 J	0.041 J	0.9 UJ	4.4 UJ	0.9 UJ	2.2 J
A3B-C06-4^1-D	0.27 J	1.3 J	10.2 J	0.034 J	0.9 UJ	4.2 UJ	0.9 UJ	1.6 J
A3B-C06-5^1	0.4 J	1.8 J	11.9 J	0.056 J	1.4 UJ	6.9 UJ	1.4 UJ	1.8 J
A3B-C06-6^1	0.31 J	1.5 J	8.1 J	0.044 J	1.1 UJ	5.4 UJ	1.1 UJ	1.2 J
A3B-C06-7^1	0.29 J	1.1 J	7.5 J	0.035 J	1 UJ	5.2 UJ	1 UJ	2.2 J
A3B-C06-9^1	0.37 J	1.4 J	7.7 J	0.051 J	0.8 UJ	4.1 UJ	0.8 UJ	1.4 J
A3B-C06-10^1	0.37 J	1.2 J	12.7 J	0.057 J	1.2 UJ	6 UJ	1.2 UJ	2.8 J
A3B-C06-12^1	0.53 J	1.1 J	52.4 J	0.085 J	1.2 UJ	6 UJ	1.2 UJ	2.8 J
A3B-C06-14^1	0.44 J	1.6 J	11.3 J	0.066 J	1.2 UJ	6 UJ	1.2 UJ	4.9 J
A3B-C06-15^1	0.44 J	1.1 J	13.7 J	0.069 J	1 UJ	5.1 UJ	1 UJ	2.8 J
A3B-C06-16^1	0.58 J	1.5 J	15.8 J	0.081 J	1.1 UJ	5.4 UJ	1.1 UJ	1.2 J
Limit	82	2900	400	29000	4300	37000	3600	920000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	0.58	2	52.4	0.085	1.4 UJ	6.9 UJ	1.4 UJ	4.9
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	12	12	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--

<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--
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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.

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CERTIFICATION UNIT A3B-C07

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C07-1^1	0.803 -	0.628 -	0.615 -	0.628 -	4.47 -	0.847 U	0.85 U	50.1 J
A3B-C07-2^1	0.805 -	0.648 -	0.662 -	0.648 -	4.98 -	0.641 U	0.46 U	62.1 J
A3B-C07-2^1-D	0.739 -	0.587 -	0.593 -	0.587 -	3.13 -	0.726 U	1.2 U	63.9 J
A3B-C07-4^1	0.762 -	0.562 -	0.548 -	0.562 -	16.8 -	0.639 U	0.359 U	47.2 J
A3B-C07-6^1	0.762 -	0.61 -	0.637 -	0.61 -	4.85 -	0.628 U	0.43 U	91.2 J
A3B-C07-7^1	0.894 -	0.568 -	0.595 -	0.568 -	2.27 -	0.705 U	0.65 U	56.5 J
A3B-C07-8^1	0.726 -	0.519 -	0.554 -	0.519 -	11.4 -	0.62 U	0.97 U	65.4 J
A3B-C07-9^1	1.02 -	0.8 -	0.794 -	0.8 -	9.14 -	0.739 U	0.85 U	89.4 J
A3B-C07-10^1	0.865 -	0.677 -	0.712 -	0.677 -	6.93 -	0.694 U	1.1 U	42.7 J
A3B-C07-12^1	0.768 -	0.731 -	0.757 -	0.731 -	3.31 -	0.652 U	1 U	55.4 J
A3B-C07-13^1	0.793 -	0.527 -	0.522 -	0.527 -	2.9 -	0.601 U	1.1 U	57.3 J
A3B-C07-14^1	0.775 -	0.591 -	0.591 -	0.591 -	5.02 -	0.664 U	1.2 U	46.2 J
A3B-C07-16^1	0.799 -	0.598 -	0.598 -	0.598 -	3.43 -	0.771 U	0.72 U	43.2 J
Limit	1.7	1.8	1.7	1.5	20	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.02	0.8	0.794	0.8	16.8	0.847 U	1.2 U	91.2
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3B-C07

(cont.)

SAMPLEID	Cadmium	Molybdenum	Lead	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C07-1^1	0.31 J	1.7 -	7.6 J	0.049 J	0.9 U	1.3 J	0.9 U	0.9 U
A3B-C07-2^1	0.29 J	1.6 -	7.4 J	0.052 J	1 U	1.6 J	1 U	5.3 J
A3B-C07-2^1-D	0.32 J	1.8 -	7.2 J	0.056 J	0.9 U	4.5 U	0.9 U	27 J
A3B-C07-4^1	0.3 J	2 -	6.9 J	0.05 J	1 U	4.8 U	1 U	26 J
A3B-C07-6^1	0.29 J	1.5 -	6.6 J	0.052 J	1 U	4.8 U	1 U	9.7 J
A3B-C07-7^1	0.29 J	1.7 -	5.3 J	0.063 J	1 U	4.9 U	1 U	9 J
A3B-C07-8^1	0.3 J	1.2 -	7.5 J	0.051 J	0.8 U	4.2 U	0.8 U	2.7 J
A3B-C07-9^1	0.52 -	2.6 -	10.9 J	0.077 J	0.9 U	4.7 U	0.9 U	0.9 U
A3B-C07-10^1	0.34 J	1.7 -	6.3 J	0.054 J	1 U	5.1 U	1 U	3 J
A3B-C07-12^1	0.35 J	1.7 -	6.4 J	0.052 J	1 U	3.2 J	1 U	3.6 J
A3B-C07-13^1	0.31 J	1.5 -	7.6 J	0.054 J	0.9 U	4.5 U	0.9 U	0.9 U
A3B-C07-14^1	0.3 J	1.5 -	11.5 J	0.057 J	0.9 U	4.7 U	0.9 U	3.2 J
A3B-C07-16^1	0.29 J	1.5 -	6.2 J	0.052 J	1 U	1.5 J	1 U	4.4 J
Limit	82	2900	400	29000	4300	37000	3600	92000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	0.52	2.6	11.5	0.077	1 U	3.2	1 U	27
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	12	8	12	3
% Nondetects	0.0%	0.0%	0.0%	0.0%	100.0%	66.7%	100.0%	25.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3B-C08

5777

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C08-1^1	0.98 J	0.833 J	0.868 J	0.833 J	3.3 J	0.7 U	0.6 U	112 J
A3B-C08-2^1	1.21 J	0.999 J	0.979 J	0.999 J	5.77 -	0.619 U	0.9 U	112 J
A3B-C08-3^1	1.08 J	0.976 J	1 J	0.976 J	3.85 J	0.652 U	0.69 U	95.1 J
A3B-C08-5^1	1.08 J	0.99 J	1.01 J	0.99 J	6.91 -	0.602 U	1.1 U	88.6 J
A3B-C08-5^1-D	1.54 J	1.26 J	1.32 J	1.26 J	5.66 -	0.661 U	0.64 U	88 J
A3B-C08-7^1	1.07 J	0.872 J	0.859 J	0.872 J	5.06 J	0.661 U	0.72 U	69 J
A3B-C08-8^1	1.1 J	0.974 J	0.996 J	0.974 J	5.37 -	0.621 U	0.88 U	78.7 J
A3B-C08-9^1	1.26 J	1.04 J	1.04 J	1.04 J	10.1 -	0.635 U	0.388 UJ	109 J
A3B-C08-11^1	1.22 J	1.06 J	1.1 J	1.06 J	4.5 J	0.741 U	0.6 U	104 J
A3B-C08-12^1	1.28 J	1.05 J	1.05 J	1.05 J	7.1 -	0.678 U	0.53 U	96.1 J
A3B-C08-13^1	1.37 J	1.13 J	1.18 J	1.13 J	7.65 -	0.649 U	0.8 U	85.9 J
A3B-C08-15^1	1.15 J	0.938 J	0.942 J	0.938 J	3.36 J	0.697 U	1.1 U	79.7 J
A3B-C08-16^1	1.17 J	0.925 J	0.908 J	0.925 J	5.25 -	0.758 U	0.8 U	88.3 J
Limit	1.7	1.8	1.7	1.5	82	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.54	1.26	1.32	1.26	10.1	0.758 U	1.1 U	112
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--

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.

(cont.)

SAMPLEID	Cadmium	Molybdenum	Lead	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C08-1^1	0.38 J	1.1 -	10.2 J	0.073 J	0.9 U	1.8 J	0.9 U	14 J
A3B-C08-2^1	0.33 J	0.99 J	11.5 J	0.057 J	1 U	2.3 J	1 U	2.4 J
A3B-C08-3^1	0.36 J	0.9 J	10.9 J	0.058 J	0.9 U	1.5 J	0.9 U	3.8 J
A3B-C08-5^1	0.34 J	1.2 -	11.8 J	0.051 J	0.9 U	4.5 U	0.9 U	2.4 J
A3B-C08-5^1-D	0.35 J	1.1 -	13.3 J	0.059 J	1 U	4.9 U	1 U	3.6 J
A3B-C08-7^1	0.31 J	0.98 J	11.7 J	0.051 J	1 U	4.9 U	1 U	8.3 J
A3B-C08-8^1	0.29 J	0.97 J	12.7 J	0.056 J	1 U	4.9 U	1 U	24 J
A3B-C08-9^1	0.36 J	0.81 J	11.1 J	0.056 J	0.9 U	4.4 U	0.9 U	7.2 J
A3B-C08-11^1	0.35 J	0.76 J	14.7 J	0.061 J	1 U	5.1 U	1 U	1.5 J
A3B-C08-12^1	0.37 J	0.88 J	11.6 J	0.063 J	1 U	4.8 U	1 U	4.1 J
A3B-C08-13^1	0.34 J	1.1 -	12.1 J	0.055 J	1.1 U	5.5 U	1.1 U	30 J
A3B-C08-15^1	0.37 J	1.1 -	10.1 J	0.06 J	0.9 U	4.6 U	0.9 U	6.3 J
A3B-C08-16^1	0.35 J	1.2 -	11.4 J	0.054 J	0.9 U	4.6 U	0.9 U	6 J
Limit	82	2900	400	29000	4300	37000	3600	920000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	0.38	1.2	14.7	0.073	1.1 U	2.3	1.1 U	30
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	12	9	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	100.0%	75.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3B-C09

5797

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C09-1^4	1.47 J	1.22 J	1.22 J	1.22 J	4.35 -	0.912 U	1.5 U	169 J
A3B-C09-1^4-D	1.47 J	1.11 J	1.14 J	1.11 J	3.85 J	0.888 U	1.4 U	158 J
A3B-C09-1^9	1.43 J	1.1 J	1.13 J	1.1 J	6.27 -	0.79 U	1.2 U	129 J
A3B-C09-1^9-D	1.08 J	0.865 J	0.959 J	0.865 J	6.75 -	0.819 U	1.4 U	105 J
A3B-C09-2^1	1.14 J	1.01 J	1.02 J	1.01 J	5.04 -	0.871 U	0.83 U	90.7 J
A3B-C09-3^4	0.869 J	0.685 J	0.685 J	0.685 J	31.6 -	0.741 U	0.68 U	90.4 J
A3B-C09-3^8	0.954 J	0.817 J	0.831 J	0.817 J	19.6 -	0.731 U	1.5 U	89.4 J
A3B-C09-6^1	1.61 J	1.38 J	1.38 J	1.38 J	7.36 -	0.825 U	1.9 U	95 J
A3B-C09-7^1	0.953 J	0.737 J	0.751 J	0.737 J	5.54 -	0.794 U	1.2 U	62.5 J
A3B-C09-8^1	1.32 J	1.17 J	1.28 J	1.17 J	7.45 -	0.869 U	0.77 U	91.4 J
A3B-C09-9^1	1.28 J	1.02 J	1.03 J	1.02 J	7.79 -	0.813 U	1.4 U	69.8 J
A3B-C09-10^1	0.783 J	0.671 J	0.685 J	0.671 J	3.35 J	0.794 U	0.88 U	55.5 J
A3B-C09-12^1	1.26 J	1.15 J	1.16 J	1.15 J	19.2 -	0.736 U	0.71 U	130 J
A3B-C09-13^1	0.939 J	0.83 J	0.84 J	0.83 J	6.83 -	0.782 U	0.4 U	81.6 J
A3B-C09-14^1	0.908 J	0.882 J	0.894 J	0.882 J	4.81 -	0.839 U	0.57 U	98.2 J
A3B-C09-15^1	0.878 J	0.803 J	0.893 J	0.803 J	4.07 J	0.9 U	1 U	74.9 J
Limit	1.7	1.8	1.7	1.5	20	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.61	1.38	1.38	1.38	31.6	0.912 U	1.9 U	169
Max. > Limit	No	No	No	No	Yes	No	No	No
W-statistic Prob. #	--	--	--	--	4.7% (LN)	--	--	--
Test Procedure	--	--	--	--	Median (Sign)	--	--	--
Sample Size	14	14	14	14	14	14	14	14
Nondetects	0	0	0	0	0	14	14	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	6.79	--	--	--
UCL	--	--	--	--	7.79	--	--	--
Prob. > Limit	--	--	--	--	0.03%	--	--	--
Pass / Fail	--	--	--	--	Pass	--	--	--
a posteriori Sample	--	--	--	--	6	--	--	--
Size calculation	--	--	--	--	Pass	--	--	--

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.

(cont.)

SAMPLEID	Cadmium	Molybdenum	Lead	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C09-1^4	0.66 -	1.4 -	16.1 J	0.1 J	1.1 U	5.4 U	1.1 U	14 J
A3B-C09-1^4-D	0.49 J	1.2 -	14.4 J	0.096 J	1 U	4.8 U	1 U	3.2 J
A3B-C09-1^9	0.5 -	0.97 J	12.2 J	0.081 J	1 U	4.9 U	1 U	1.3 J
A3B-C09-1^9-D	0.35 J	0.75 J	15.8 J	0.066 J	1 U	5 U	1 U	5.8 J
A3B-C09-2^1	0.42 J	1.3 -	11.8 J	0.062 J	0.9 U	4.4 U	0.9 U	2.9 J
A3B-C09-3^4	0.6 -	1 -	10.1 J	0.056 J	0.8 U	4.1 U	0.8 U	1 J
A3B-C09-3^8	0.29 J	1.2 -	8.9 J	0.053 J	0.9 U	4.3 U	0.9 U	0.9 J
A3B-C09-6^1	0.3 J	1.6 -	16.8 J	0.062 J	1 U	2 J	1 U	2 J
A3B-C09-7^1	0.32 J	1.2 -	9.4 J	0.047 J	1.1 U	1.6 J	1.1 U	2.4 J
A3B-C09-8^1	0.35 J	1.3 -	13.7 J	0.063 J	1 U	2.6 J	1 U	4 J
A3B-C09-9^1	0.21 J	0.91 J	13.9 J	0.043 J	1.6 U	2.7 J	1.6 U	6.9 J
A3B-C09-10^1	0.25 J	0.98 J	8.7 J	0.039 J	1.1 U	3 J	1.1 U	5.5 J
A3B-C09-12^1	0.33 J	1 -	10.8 J	0.058 J	1 U	1.6 J	1 U	3.2 J
A3B-C09-13^1	0.32 J	1.3 -	10.9 J	0.051 J	1.1 U	2.6 J	1.1 U	1.6 J
A3B-C09-14^1	0.35 J	1.1 -	10.5 J	0.059 J	0.9 U	4.6 U	0.9 U	3.8 J
A3B-C09-15^1	0.27 J	1.1 -	10.4 J	0.039 J	1.3 U	6.4 U	1.3 U	6.4 J
Limit	82	2900	400	29000	4300	37000	3600	920000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	0.66	1.6	16.8	0.1	1.6 U	3	1.6 U	14
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	14	14	14	14	14	14	14	14
Nondetects	0	0	0	0	14	7	14	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	100.0%	50.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3B-C10

5777

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C10-1^1	0.693 J	0.496 J	0.498 J	0.496 J	3.36 -	0.744 U	0.357 UJ	38.2 J
A3B-C10-2^1	0.956 J	0.713 J	0.739 J	0.713 J	4.59 -	0.76 U	0.355 UJ	50.7 J
A3B-C10-4^1	0.82 J	0.74 J	0.692 J	0.74 J	4.72 -	0.821 U	0.355 UJ	47.8 J
A3B-C10-5^1	0.884 J	0.766 J	0.792 J	0.766 J	2.81 -	0.668 U	0.365 UJ	80.6 J
A3B-C10-6^4	0.755 J	0.568 J	0.582 J	0.568 J	4.45 -	0.718 U	0.366 UJ	44.4 J
A3B-C10-8^5	0.91 J	0.735 J	0.762 J	0.735 J	4.27 -	0.732 U	0.362 UJ	47 J
A3B-C10-9^1	1.21 J	1.1 J	1.13 J	1.1 J	7.35 -	0.735 U	0.387 UJ	67.7 J
A3B-C10-9^1-D	1.44 J	1.12 J	1.17 J	1.12 J	6.32 -	0.864 U	0.409 UJ	91.6 J
A3B-C10-10^1	0.869 J	0.616 J	0.613 J	0.616 J	16.2 -	0.686 U	0.413 UJ	47.9 J
A3B-C10-11^1	0.96 J	0.886 J	0.912 J	0.886 J	8.16 -	0.714 U	0.374 UJ	68.6 J
A3B-C10-13^6	0.855 J	0.682 J	0.683 J	0.682 J	3.89 -	0.809 U	0.379 UJ	36.5 J
A3B-C10-14^5	0.92 J	0.627 J	0.622 J	0.627 J	4.13 -	0.79 U	0.381 UJ	52.9 J
A3B-C10-15^5	0.807 J	0.675 J	0.707 J	0.675 J	4.62 -	0.648 U	0.376 UJ	42.9 J
Limit	1.7	1.8	1.7	1.5	82	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.44	1.12	1.17	1.12	16.2	0.864 U	0.413 UJ	91.6
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	0	12	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3B-C10

(cont.)

SAMPLEID	Cadmium	Molybdenum	Lead	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C10-1^1	0.24 J	1.3 -	8.4 J	0.035 J	1 U	5.1 U	1.2 -	9.4 J
A3B-C10-2^1	0.2 J	1.3 -	5.4 J	0.029 J	0.9 U	4.6 U	0.9 U	9.4 J
A3B-C10-4^1	0.26 J	1.2 -	7.2 J	0.038 J	1 U	5 U	1 U	11 J
A3B-C10-5^1	0.22 J	1.6 -	6.9 J	0.035 J	1 U	5 U	1 U	7.1 J
A3B-C10-6^4	0.2 J	1.4 -	6.6 J	0.038 J	0.5 J	4.2 U	0.8 U	3.9 J
A3B-C10-8^5	0.18 J	1.2 -	7.4 J	0.035 J	1.1 U	5.5 U	1.1 U	6.9 J
A3B-C10-9^1	0.28 J	1.1 -	8.2 J	0.039 J	1 U	5 U	1 U	1.5 J
A3B-C10-9^1-D	0.42 J	1.3 -	11.9 J	0.072 J	1 U	4.9 U	1 U	1 U
A3B-C10-10^1	0.23 J	1.6 -	6.1 J	0.033 J	1 U	5.2 U	1 U	1.2 J
A3B-C10-11^1	0.27 J	1.1 -	8.8 J	0.041 J	1 U	5.1 U	1 U	9.4 J
A3B-C10-13^6	0.21 J	1.3 -	5.2 J	0.037 J	0.8 U	4.2 U	0.8 U	1.8 J
A3B-C10-14^5	0.2 J	2.1 -	8.2 J	0.046 J	1.2 U	6 U	1.2 U	4.7 J
A3B-C10-15^5	0.22 J	1.3 -	7.8 J	0.033 J	1 U	4.8 U	1.6 -	3.4 J
Limit	82	2900	400	29000	4300	37000	3600	92000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	0.42	2.1	11.9	0.072	0.5	6 U	1.6	11
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	11	12	10	12
% Nondetects	0.0%	0.0%	0.0%	0.0%	91.7%	100.0%	83.3%	100.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3B-C11

1577

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C11-1^1	1.22 J	1.11 -	1.16 -	1.11 -	3.51 -	0.958 U	0.56 U	95 J
A3B-C11-2^1	1.29 J	1.06 -	1.1 -	1.06 -	4.92 -	0.785 U	0.401 UJ	127 J
A3B-C11-3^1	1.16 J	0.925 -	0.946 -	0.925 -	10 -	0.9 U	0.371 UJ	106 J
A3B-C11-3^1-D	1.31 J	0.824 -	0.823 -	0.824 -	11.7 -	0.876 U	6 J	110 J
A3B-C11-5^1	1.3 J	1.02 -	1.01 -	1.02 -	11.6 -	0.893 U	0.72 U	90.9 J
A3B-C11-6^1	1.1 J	0.871 -	0.878 -	0.871 -	5.83 -	0.847 U	0.73 U	85.2 J
A3B-C11-8^6	1.64 J	1.22 -	1.23 -	1.22 -	6.84 -	0.858 U	1.2 J	218 J
A3B-C11-8^12	1.07 J	0.545 -	0.564 -	0.545 -	3.6 -	0.813 U	0.61 U	111 J
A3B-C11-10^4	1.58 J	1.28 -	1.29 -	1.28 -	4.94 -	1.01 U	1.3 J	176 J
A3B-C11-10^10	0.644 J	0.408 -	0.42 -	0.408 -	3.08 -	0.721 U	0.368 UJ	41.9 J
A3B-C11-11^1	1.4 J	1.23 -	1.22 -	1.23 -	7.01 -	0.932 U	1.1 J	133 J
A3B-C11-12^1	0.756 J	0.605 -	0.61 -	0.605 -	3.34 -	0.859 U	0.36 UJ	68.7 J
A3B-C11-13^1	1.25 J	1.09 -	1.12 -	1.09 -	11.5 -	0.793 U	0.62 U	102 J
A3B-C11-15^1	1.37 J	1.15 -	1.18 -	1.15 -	8.91 -	0.82 U	0.369 UJ	100 J
A3B-C11-16^1	1.05 J	0.911 -	0.914 -	0.911 -	3.67 -	0.82 U	0.41 U	97.8 J
Limit	1.7	1.8	1.7	1.5	82	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.64	1.28	1.29	1.28	11.7	1.01 U	6	218
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	14	14	14	14	14	14	14	14
Nondetects	0	0	0	0	0	14	10	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	71.4%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--

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.

(cont.)

SAMPLEID	Cadmium	Molybdenum	Lead	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C11-1^1	0.13 U	1.1 J	11.4 J	0.0995 U	0.9 U	4.5 U	0.9 U	2.4 J
A3B-C11-2^1	0.14 U	0.7 U	14 J	0.105 U	1 U	5.2 U	1 U	1 U
A3B-C11-3^1	0.15 U	0.89 U	11.4 J	0.0974 U	1 U	4.7 U	1 U	3.6 J
A3B-C11-3^1-D	0.261 U	1.6 J	12.6 J	0.492 U	1 U	5 U	1 U	4.2 J
A3B-C11-5^1	0.0532 U	0.85 U	16.6 J	0.1 U	0.8 U	4 U	0.8 U	1 J
A3B-C11-6^1	0.091 U	1 J	11.4 J	0.0942 U	0.9 U	4.6 U	0.9 U	2.4 J
A3B-C11-8^6	0.38 J	4.6 -	19.8 J	0.11 U	1.1 U	5.3 U	1.1 U	2.7 J
A3B-C11-8^12	0.19 U	2.6 -	8.5 J	0.107 U	1.5 U	7.7 U	1.5 U	5.5 J
A3B-C11-10^4	0.35 J	1.8 -	19.5 J	0.114 U	1.1 U	5.4 U	1.1 U	5.3 J
A3B-C11-10^10	0.054 U	2.2 -	9.1 J	0.0968 U	0.9 U	4.3 U	0.9 U	1 J
A3B-C11-11^1	0.15 U	0.93 U	19.1 J	0.107 U	1 U	5.3 U	1 U	2.6 J
A3B-C11-12^1	0.16 U	1.5 -	8.4 J	0.0946 U	1.1 U	5.3 U	1.1 U	2.7 J
A3B-C11-13^1	0.053 U	0.76 U	15.5 J	0.1 U	1.2 U	6 U	1.2 U	1.1 J
A3B-C11-15^1	0.14 U	0.91 U	13.8 J	0.097 U	1 U	5.2 U	1 U	1.6 J
A3B-C11-16^1	0.099 U	0.89 U	9 J	0.0969 U	1 U	5 U	1 U	4.9 J
Limit	82	2900	400	29000	4300	37000	3600	920000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	0.38	4.6	19.8	0.492 U	1.5 U	7.7 U	1.5 U	5.5
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	14	14	14	14	14	14	14	14
Nondetects	12	6	0	14	14	14	14	0
% Nondetects	85.7%	42.9%	0.0%	100.0%	100.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

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CERTIFICATION UNIT A3B-C12

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C12-1^1	1.08 J	0.938 -	0.953 -	0.938 -	4.54 J	0.86 U	0.383 U	83.3 J
A3B-C12-3^4	1.24 -	0.652 -	0.654 -	0.652 -	1.88 U	1.16 U	0.5 UJ	72.8 J
A3B-C12-4^3	1.22 -	0.696 -	0.757 -	0.696 -	8.04 -	1.03 U	0.376 UJ	75.3 J
A3B-C12-4^3-D	1.11 -	0.622 -	0.656 -	0.622 -	5.61 -	0.649 U	0.5 UJ	57.1 J
A3B-C12-5^1	1.09 J	0.964 -	0.99 -	0.964 -	5.85 J	0.923 U	0.373 U	103 J
A3B-C12-6^1	0.85 J	0.69 -	0.726 -	0.69 -	5.23 J	0.948 U	0.367 U	62.4 J
A3B-C12-7^1	0.808 J	0.763 -	0.795 -	0.763 -	2.7 J	0.862 U	0.368 U	142 J
A3B-C12-9^5	1.26 -	1.03 -	1.07 -	1.03 -	8.4 -	0.708 U	0.65 UJ	60.6 J
A3B-C12-10^4	0.747 J	0.648 -	0.671 -	0.648 -	1.6 U	0.908 U	0.57 U	62.6 J
A3B-C12-12^1	0.874 J	0.633 -	0.64 -	0.633 -	4.26 J	0.999 U	0.36 U	62.1 J
A3B-C12-14^1	0.903 J	0.496 -	0.779 -	0.496 -	4.13 J	0.891 U	0.359 U	65.9 J
A3B-C12-15^4	0.766 J	0.478 -	0.489 -	0.478 -	3.23 J	0.934 U	0.374 U	38.8 J
A3B-C12-16^1	0.834 J	0.564 -	0.59 -	0.564 -	2.32 J	0.825 U	0.355 U	56.2 J
Limit	1.7	1.8	1.7	1.5	82	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.26	1.03	1.07	1.03	8.4	1.16 U	0.65 UJ	142
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	2	12	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	16.7%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

(cont.)

SAMPLEID	Cadmium	Molybdenum	Lead	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C12-1^1	0.51 -	1.5 -	9.4 J	0.094 J	1 U	4.8 U	1 U	7.1 J
A3B-C12-3^4	0.47 J	1.5 -	12.3 J	0.063 J	1 U	5 U	1 U	2.5 J
A3B-C12-4^3	0.21 J	0.88 J	8.8 J	0.029 J	0.9 U	4.3 U	0.9 U	4.2 J
A3B-C12-4^3-D	0.32 J	1.2 -	7.4 J	0.045 J	0.9 U	4.4 U	0.9 U	5 J
A3B-C12-5^1	0.38 J	1.3 -	11.1 J	0.061 J	1.1 U	5.7 U	1.1 U	5.2 J
A3B-C12-6^1	0.4 J	1.5 -	8.1 J	0.052 J	1 U	1.5 J	1 U	7.2 J
A3B-C12-7^1	0.29 J	1.1 -	12.7 J	0.051 J	1 U	5.2 U	1 U	7.2 J
A3B-C12-9^5	0.31 J	1.5 -	8.1 J	0.036 J	0.9 U	4.4 U	0.9 U	6.9 J
A3B-C12-10^4	0.32 J	1.4 -	9.8 J	0.063 J	1 U	5.2 U	1 U	4.2 J
A3B-C12-12^1	0.27 J	1.4 -	7.6 J	0.05 J	1.1 U	1.6 J	1.1 U	7.2 J
A3B-C12-14^1	0.31 J	1.2 -	7.6 J	0.055 J	1 U	4.8 U	1 U	7.5 J
A3B-C12-15^4	0.32 J	1.2 -	5.4 J	0.032 J	1 U	4.8 U	1 U	3.7 J
A3B-C12-16^1	0.29 J	1.5 -	8 J	0.047 J	0.9 U	4.5 U	0.9 U	4.8 J
Limit	82	2900	400	29000	4300	37000	3600	920000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	0.51	1.5	12.7	0.094	1.1 U	1.6	1.1 U	7.5
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12	12	12
Nondetects	0	0	0	0	12	10	12	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	100.0%	83.3%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--

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.

15777

CERTIFICATION UNIT A3B-PILE1

E-5777

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C04-8^P1-4	1.15 -	0.957 -	0.941 -	0.957 -	3.77 -	0.84 U	0.404 U	112 J
A3B-C05-9^P1-2	1.08 J	1.18 J	1.2 J	1.18 J	4.44 -	0.867 U	0.394 UJ	94.5 J
A3B-C04-10^P1-4	0.75 -	0.607 -	0.588 -	0.607 -	3.93 -	0.818 U	0.381 U	69.9 J
A3B-C04-11^P1-1	1.19 -	1.03 -	1.03 -	1.03 -	4.2 -	0.82 U	0.392 U	90.3 J
A3B-C04-11^P1-1-D	1.22 -	1.17 -	1.19 -	1.17 -	3.96 -	0.811 U	0.401 U	92.3 J
A3B-C04-12^P1-2	1.26 -	1.09 -	1.12 -	1.09 -	9.91 -	0.735 U	0.398 U	74.3 J
A3B-C04-14^P1-2	0.76 -	0.487 -	0.486 -	0.487 -	3.4 -	0.794 U	0.367 U	50 J
Limit	1.7	1.8	1.7	1.5	82	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.26	1.18	1.2	1.18	9.91	0.867 U	0.404 U	112
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	6	6	6	6	6	6	6	6
Nondetects	0	0	0	0	0	6	6	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3B-PILE1

(cont.)

SAMPLEID	Cadmium	Lead	Molybdenum	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C04-8^P1-4	0.49 J	11.7 J	0.97 J	0.078 J	1.1 U	5.4 U	1.1 U	2.2 J
A3B-C05-9^P1-2	0.25 J	12.2 J	0.71 J	0.04 J	0.9 U	4.4 U	0.9 U	0.9 U
A3B-C04-10^P1-4	0.54 -	7.2 J	1.3 -	0.089 J	0.9 U	4.5 U	0.9 U	2.7 J
A3B-C04-11^P1-1	0.47 J	14.4 J	0.74 J	0.074 J	1.1 U	5.6 U	1.1 U	0.9 J
A3B-C04-11^P1-1-D	0.71 J	13.2 J	1.2 J	0.12 J	1.1 U	5.7 U	1.1 U	1.2 J
A3B-C04-12^P1-2	0.27 J	15.4 J	0.71 J	0.053 J	1 U	5.3 U	1 U	4.1 J
A3B-C04-14^P1-2	0.41 J	7.8 J	2.8 -	0.063 J	1 U	5 U	1 U	2.9 J
Limit	82	400	2900	29000	4300	37000	3600	920000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	0.71	15.4	2.8	0.12	1.1 U	5.7 U	1.1 U	4.1
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	6	6	6	6	6	6	6	6
Nondetects	0	0	0	0	6	6	6	1
% Nondetects	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	16.7%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--

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.

11-5777

CERTIFICATION UNIT A3B-PILE2

5777

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C02-3^P2-2	0.934 J	0.596 J	0.618 J	0.596 J	5.96 -	0.643 U	0.37 UJ	43.9 J
A3B-C12-3^P2-2	0.91 -	0.613 -	0.656 -	0.613 -	4.01 -	0.606 U	0.43 UJ	51.4 J
A3B-C12-4^P2-1	0.884 -	0.592 -	0.605 -	0.592 -	3.17 -	0.643 U	0.77 UJ	40 J
A3B-C12-4^P2-1-D	0.817 -	0.648 -	0.646 -	0.648 -	5.03 -	1.06 U	0.89 UJ	71 J
A3B-C02-6^P2-1	0.832 J	0.548 J	0.589 J	0.548 J	4.09 -	0.593 U	0.365 UJ	52.1 J
A3B-C10-6^P2-1	0.815 J	0.633 J	0.618 J	0.633 J	2.58 -	0.673 U	0.367 UJ	45.2 J
A3B-C02-7^P2-1	0.829 J	0.582 J	0.572 J	0.582 J	4.09 -	0.901 U	0.361 UJ	63.1 J
A3B-C02-7^P2-1-D	1.06 J	0.807 J	0.845 J	0.807 J	4.78 -	0.627 U	0.368 UJ	52 J
A3B-C10-8^P2-2	0.785 J	0.59 J	0.637 J	0.59 J	3.06 -	0.658 U	0.361 UJ	59.4 J
A3B-C12-9^P2-2	0.772 -	0.587 -	0.606 -	0.587 -	3.35 -	0.991 U	0.364 UJ	35.4 J
A3B-C02-10^P2-1	0.87 J	0.638 J	0.614 J	0.638 J	7 -	0.638 U	0.374 UJ	57.4 J
A3B-C12-10^P2-1	0.921 J	0.681 -	0.705 -	0.681 -	5.92 J	0.916 U	0.359 U	44.2 J
A3B-C10-13^P2-2	0.836 J	0.633 J	0.64 J	0.633 J	2.9 -	0.693 U	0.367 UJ	65.3 J
A3B-C10-14^P2-2	1.39 J	0.609 J	0.608 J	0.609 J	6.13 -	0.657 U	0.371 UJ	49.9 J
A3B-C12-15^P2-1	0.763 J	0.611 -	0.638 -	0.611 -	1.83 U	0.915 U	0.38 U	58.2 J
A3B-C10-15^P2-2	0.811 J	0.637 J	0.635 J	0.637 J	2.92 -	0.756 U	0.364 UJ	47.9 J
Limit	1.7	1.8	1.7	1.5	82	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.39	0.807	0.845	0.807	7	1.06 U	0.89 UJ	71
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	14	14	14	14	14	14	14	14
Nondetects	0	0	0	0	1	14	14	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	7.1%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--

<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--

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.

CERTIFICATION UNIT A3B-PILE2

(cont.)

SAMPLEID	Cadmium	Lead	Molybdenum	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C02-3^P2-2	0.28 J	7 J	0.9 J	0.039 J	1.2 U	6.1 U	1.2 U	4.9 J
A3B-C12-3^P2-2	0.35 J	7.5 J	2.3 -	0.055 J	0.9 U	4.4 U	0.9 U	6.2 J
A3B-C12-4^P2-1	0.36 J	6 J	1.4 -	0.054 J	0.9 U	4.6 U	0.5 J	7 J
A3B-C12-4^P2-1-D	0.32 J	7.6 J	1.7 -	0.047 J	0.9 U	4.7 U	1.6 J	11 J
A3B-C02-6^P2-1	0.24 J	8.1 J	1.2 -	0.048 J	1 U	4.8 U	1 U	3.4 J
A3B-C10-6^P2-1	0.19 J	5.8 J	1.3 -	0.035 J	1 U	5 U	1.3 -	6.5 J
A3B-C02-7^P2-1	0.23 J	7.9 J	1 -	0.036 J	1 U	5.2 U	1 U	8.9 J
A3B-C02-7^P2-1-D	0.3 J	7.7 J	1.4 -	0.047 J	1.1 U	5.6 U	1.1 U	11 J
A3B-C10-8^P2-2	0.22 J	5.9 J	1.8 -	0.035 J	0.9 U	4.5 U	0.5 J	3.4 J
A3B-C12-9^P2-2	0.36 J	4.6 J	1.4 -	0.051 J	0.8 U	4.1 U	0.8 U	3.9 J
A3B-C02-10^P2-1	0.28 J	9.3 J	1.4 -	0.044 J	1 U	4.8 U	1 U	6.6 J
A3B-C12-10^P2-1	0.27 J	6 J	1.6 -	0.046 J	1 U	5 U	1 U	3.5 J
A3B-C10-13^P2-2	0.18 J	7.2 J	1.5 -	0.035 J	0.9 U	4.7 U	0.9 U	5.2 J
A3B-C10-14^P2-2	0.17 J	7.2 J	1.2 -	0.031 J	0.9 U	4.7 U	0.9 U	5.3 J
A3B-C12-15^P2-1	0.25 J	7.2 J	1.4 -	0.047 J	0.9 U	4.6 U	0.9 U	5.5 J
A3B-C10-15^P2-2	0.25 J	7.4 J	2.5 -	0.039 J	1 U	5.2 U	1 U	4.8 J
Limit	82	400	2900	29000	4300	37000	3600	920000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	0.36	9.3	2.5	0.055	1.2 U	6.1 U	1.6	11
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	14	14	14	14	14	14	14	14
Nondetects	0	0	0	0	14	14	11	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	78.6%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

1-5777

CERTIFICATION UNIT A3B-PILE3

5777

SAMPLEID	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Technetium-99	Antimony	Barium
A3B-C03-3^P3-2	1 -	1.14 J	1.16 J	1.14 J	5.08 -	0.723 U	0.413 U	105 J
A3B-C03-4^P3-2	1.51 -	1.2 J	1.22 J	1.2 J	4.54 -	0.841 U	0.97 U	171 J
A3B-C03-6^P3-4	1.36 -	1.05 J	1.24 J	1.05 J	4.33 -	0.801 U	1.3 U	152 J
A3B-C03-7^P3-4	0.995 -	1.17 J	1.18 J	1.17 J	8.41 -	0.799 U	0.62 U	161 J
A3B-C03-8^P3-4	1.52 -	1.11 J	1.11 J	1.11 J	4.71 -	0.822 U	1.5 U	181 J
A3B-C03-10^P3-2	1.43 -	1.16 J	1.18 J	1.16 J	1.9 U	0.844 U	1 U	217 J
A3B-C03-14^P3-2	1.34 -	1.12 J	1.12 J	1.12 J	3.83 -	0.824 U	0.99 U	171 J
A3B-C03-15^P3-2	1.32 -	0.949 J	0.962 J	0.949 J	4.78 -	0.815 U	0.5 U	161 J
A3B-C03-15^P3-2-D	1.5 -	0.962 J	0.957 J	0.962 J	3.78 -	0.759 U	0.409 U	147 J
Limit	1.7	1.8	1.7	1.5	82	30	96	68000
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g	mg/kg	mg/kg
Conf. Level	95%	95%	95%	95%	95%	90%	90%	90%
Max. Result	1.52	1.2	1.24	1.2	8.41	0.844 U	1.5 U	217
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	8	8	8	8	8	8	8	8
Nondetects	0	0	0	0	1	8	8	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	12.5%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--

<i>a posteriori</i> Sample	--	--	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--	--	--

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.

(cont.)

SAMPLEID	Cadmium	Lead	Molybdenum	Silver	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-C03-3^P3-2	0.44 J	9.6 J	1.2 -	0.097 J	1 U	5.1 U	1 U	5.8 J
A3B-C03-4^P3-2	0.44 J	14.4 J	0.91 J	0.088 J	1 U	5.2 U	1 U	2.8 J
A3B-C03-6^P3-4	0.39 J	14.6 J	0.82 J	0.093 J	1.1 U	5.3 U	1.1 U	3.6 J
A3B-C03-7^P3-4	0.51 -	11.9 J	0.75 J	0.11 J	1.1 U	5.6 U	1.1 U	7.3 J
A3B-C03-8^P3-4	1.5 -	33.5 J	2.5 -	0.12 J	1.1 U	5.4 U	1.1 U	1.2 J
A3B-C03-10^P3-2	1.3 -	17.7 J	6 -	0.22 J	1.1 U	5.4 U	1.1 U	1.3 J
A3B-C03-14^P3-2	0.57 -	14.4 J	1.1 -	0.12 J	1.1 U	5.3 U	1.1 U	6.7 J
A3B-C03-15^P3-2	0.65 -	13.3 J	2.7 -	0.087 J	1 U	5.1 U	1 U	4.8 J
A3B-C03-15^P3-2-D	0.72 -	8.6 J	2.8 -	0.097 J	1.1 U	5.6 U	1.1 U	3 J
Limit	82	400	2900	29000	4300	37000	3600	920000000
Units	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%	90%	90%
Max. Result	1.5	33.5	6	0.22	1.1 U	5.6 U	1.1 U	7.3
Max. > Limit	No	No	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--	--	--
Sample Size	8	8	8	8	8	8	8	8
Nondetects	0	0	0	0	8	8	8	0
% Nondetects	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	0.0%
Est. Mean*	--	--	--	--	--	--	--	--
UCL	--	--	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	--	--

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.

5777

CERTIFICATION UNIT A3B-HWMU20^a

14-5777

SAMPLEID	Barium	Lead	1,1,1-Trichloroethane	Methylene chloride	Tetrachloroethene	Xylenes, Total
A3B-HWMU20-1^1	92 J	22.4 J	1.1 U	5.5 U	1.1 U	1.1 J
A3B-HWMU20-2^1	41.3 J	7.8 J	1 U	5 U	1 U	3.7 J
A3B-HWMU20-3^1	77.5 J	9.2 J	1 U	5.1 U	1 U	3.9 J
A3B-HWMU20-4^1	79.3 J	10 J	1 U	4.9 U	1 U	0.7 J
Limit	68000	400	4300	37000	3600	920000000
Units	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg
Conf. Level	90%	90%	90%	90%	90%	90%
Max. Result	255	52.4	0.5	3.2	1.6	30
Max. > Limit	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	181	181	181	181	181	181
Nondetects	0	0	180	161	176	9
% Nondetects	0.0%	0.0%	99.4%	89.0%	97.2%	5.0%
Est. Mean*	--	--	--	--	--	--
UCL	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--

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.

^a The entire Area 3B, which includes CUs 01 through 12; Pile CUs 1, 2, and 3; and the data presented above are used to determine the maximum result, sample size, and the number of nondetected results. The data for CUs 01 through 12 as well as Pile CUs 1, 2, and 3 are presented in the previous tables.

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APPENDIX C

**VARIANCE/FIELD CHANGE NOTICES FOR THE
AREA 3A AND AREA 3B CERTIFICATION SAMPLING PSP**

VARIANCE / FIELD CHANGE NOTICE

Significant?
(Yes or No): ~~YES~~

NO Ref 10/1/04

V/F: 20803-PSP-0002-02

BS NO.: PROJECT/DOCUMENT/ECDC #20803-PSP-0002 REV 0

Page: 1 of 1 **5777**

PROJECT TITLE: Project Specific Plan for Area 3A and Area 3B Certification
Sampling

Date: 10/01/04

VARIANCE / FIELD CHANGE NOTICE (Include justification):

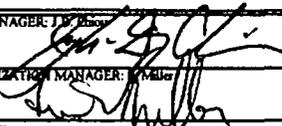
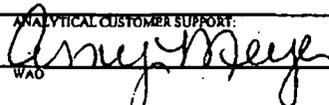
This Variance documents changing the turn around time for sample analysis, which are defined in Section 3.0. Beginning on 10/03/04 the turn around time for all samples shipped to an offsite laboratory for analysis of TALs B, C, D, E, F, G, H, I, J, and K will be changed from 30 days to 21 days. The turn around time for all samples shipped to an offsite laboratory for analysis of TAL A will remain at 30 days due to the amount of time it takes to for the in growth of radium-226.

Justification:
Changing the turn around time for TALs B, C, D, E, F, G, H, I, J, and K will allow for adequate time to perform data validation and statistical analysis and help ensure that all data issues for these analysis are addressed prior to the final certification Report.

Section 3.4 of the PSP, the changes to the PSP will be documented with a V/FCN.

REQUESTED BY: Krista Flaugh

Date: 10/01/04

ID	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
		10/1/04	X	PROJECT MANAGER: 	10/1/04
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: 	10/1/04
	ANALYTICAL CUSTOMER SUPPORT: WAD 	10/1/04		RTIMP Manager	
				Sampling Manager: T. Buhlage	

VARIANCE/FCN APPROVED YES NO

REVISION REQUIRED: YES NO

DISTRIBUTION

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

VARIANCE / FIELD CHANGE NOTICE

Significant?
(Yes or No) **YES**

V/F: 20803²PSP-0002-03

WBS NO.: PROJECT/DOCUMENT/ECDC #20803-PSP-0002 REV 0

Page: 1 of 3

PROJECT TITLE: Project Specific Plan for Area 3A and Area 3B Certification Sampling

Date: 11/23/04

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VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance documents the collection of four total uranium (TAL O) samples in Area 3A from CU 4. Two samples from sub-CU 9 and two samples from sub-CU 15 will be collected, due to above-FRL results. Samples will be collected from the original sample locations in these sub-CUs where the area was excavated and samples will be collected from an additional random location within each of the sub-CUs. See Figure 1. Additionally, 15-centimeter real-time HPGe measurements will be taken at each of the two excavated areas to verify that the contamination has been removed.

The sample ID for the physical sample to be collected at the original location in sub-CU 9 shall be identified as A3A-C04-9A¹-R and the sample ID for the physical sample to be collected at another random location in sub-CU 9 shall be identified as A3A-C04-17¹-R. The sample ID for the physical sample to be collected at the original location in sub-CU 15 shall be identified as A3A-C04-15A¹-R and the sample ID for the physical sample to be collected at another random location in sub-CU 15 shall be identified as A3A-C04-18¹-R.

Where:

A3A = Area 3A

C04 = CU 4

9, 15, 17, and 18 = Sample Locations within the CU

A = additional sample at this location

1 = depth interval (i.e. 0-0.5 feet)

R = radiological analysis

See Attachment 1 for the TAL and the Sampling and Analytical Requirement.

Surveying required: Yes. Surveyors should survey these locations.

Field QC samples required: No

Field data validation: Yes

Analytical data validation: Yes - VSL D

Off-site data package requirements (if applicable): ASL D

The highest total uranium result for the area is 36.9 mg/kg from boring A3A-C04-9.

Justification:

Certification Unit 4 in Area 3A failed for total uranium with the UCL on the mean being greater than the FRL. Only two individual samples (A3A-C04-9¹-R and A3A-C04-15¹-R) were greater than the FRL. Therefore, the two areas where the above FRL samples were collected, were excavated to remove the contamination. Following the excavation, it is necessary to sample these locations again as well as an additional random location within each of these sub-CUs to demonstrate that the remainder of the sub-CU is adequately represented. The results of the additional samples taken under this variance will replace the above FRL uranium sample results (now excavated) in the performance of the statistics. Per Section 3.4 of the PSP, the changes to the PSP will be documented with a V/FCN.

REQUESTED BY: Greg Lupton / Krista Flaugh

Date: 11/23/04

IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
	QUALITY ASSURANCE: R. Phuka <i>Dave Wessel</i>	11-29-04	X	PROJECT MANAGER: J.D. Chou <i>J.D. Chou</i>	11/23/04
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: J. Miller <i>Frank Miller</i>	11/23/04
	ANALYTICAL CUSTOMER SUPPORT: WAO <i>Greg Lupton</i>	11-30-04		RTMP Manager	
			X	Sampling Manager: T. Buhlinger <i>T. Buhlinger</i>	11/30/04
VARIANCE/FCN APPROVED [X] YES [] NO			REVISION REQUIRED: [] YES [x] NO		

DISTRIBUTION

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

5777

CU	Location	Depth (feet)	Sample ID	TAL	Northing	Easting
4	4-9A	0-0.5	A3A-C04-9A^1-R	O	480949.906	1350195.991
	4-15A	0-0.5	A3A-C04-15A^1-R	O	480829.06	1349991.335
	4-17	0-0.5	A3A-C04-17^1-R	O	480939	1350192.6
	4-18	0-0.5	A3A-C04-18^1-R	O	480832.2	1350012.2

TAL 20803-PSP-0002-O

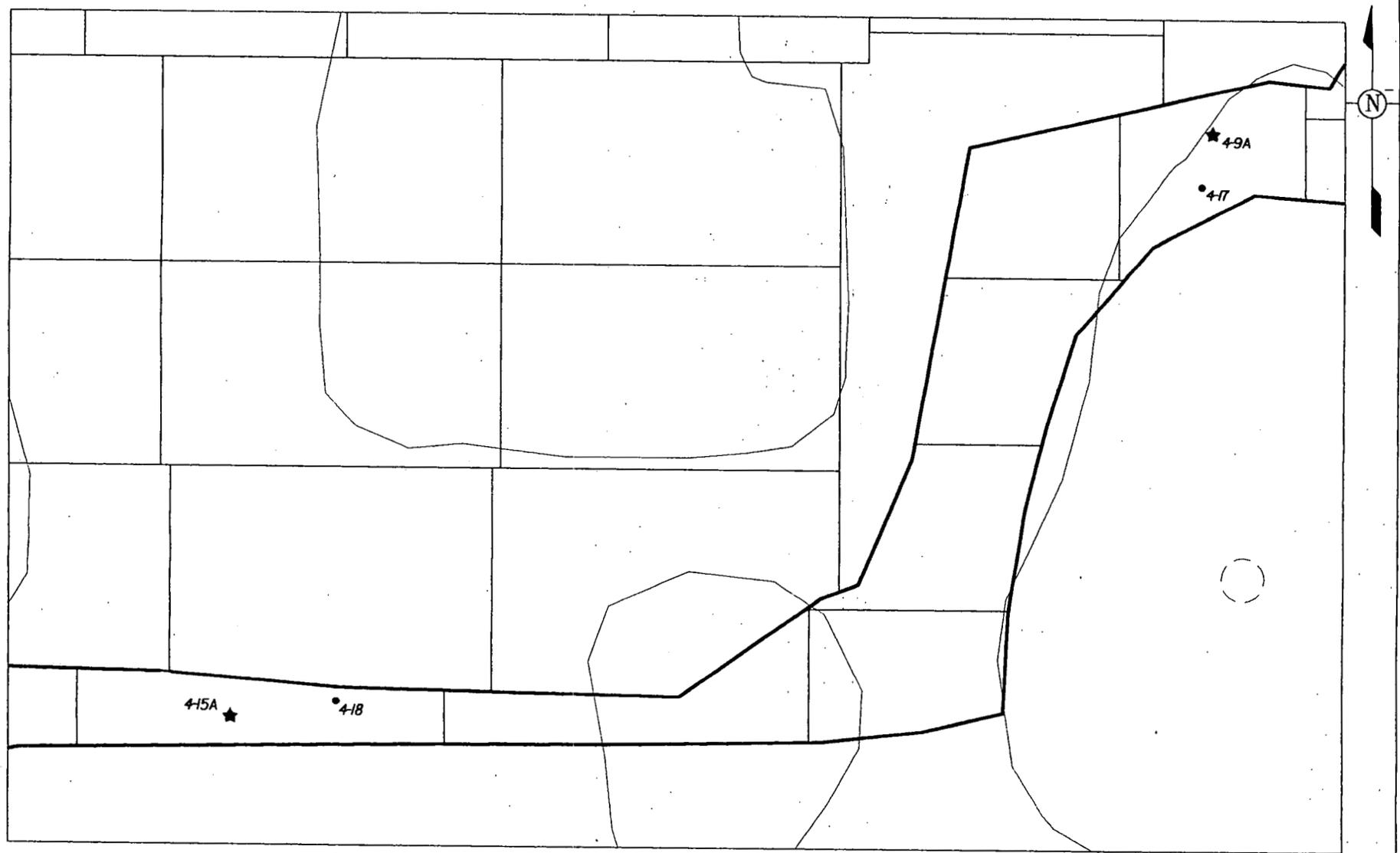
Component	MDL
Total Uranium	2 mg/kg

SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Sample Matrix	Lab	ASL	TAT	Preservative	Holding Time	Container	Sample Volume/Mass
TAL O	Solid	Offsite	D	3 day	None	12 months	Appropriate Plastic or Glass	300 g (900 g)*

*At the direction of the Field Sampling Lead, triple the specified volume must be collected for all samples at one location in order for the contract laboratory to perform the required quality control analysis.

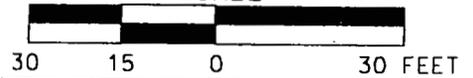
The samples shall be identified on the Chain of Custody/Request for Analysis forms as "designated for laboratory QC".



LEGEND:

- CU BOUNDARY
- RANDOM SAMPLE LOCATION
- ★ ORIGINAL SAMPLE LOCATION

SCALE



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FIGURE 1.

5777



State of Ohio Environmental Protection Agency

Southwest District Office

101 East Fifth Street
Dayton, Ohio 45402-2911

TELE: (937) 285-6357 FAX: (937) 285-6404

Bob Taft, Governor
Maureen O'Connor, Lt. Governor
Christopher Jones, Director

MEMO

Post-It Fax Note 7671		Date	# of pages
To	J.D. Chiou		
Co/Dept		From	Ohio EPA
Phone #		Co	
Fax #	25131	Phone #	
		Fax #	

TO: J.D. Chiou

FROM: Donna Bohannon (B)

DATE: November 23, 2004

SUBJECT: APPROVAL - V/FCN20803-PSP-0002-03 for Project Specific Plan for Area 3A and Area 3B Certification

This V/FCN documents the collection of four samples in Area 3A from CU 4 for total uranium, due to above FRL results. Two samples will be from the excavated area of the original points in sub-CU 9, and two locations will be from sub-CU 15. The additional sample results will determine whether the excavation has removed the above FRL contamination. Ohio EPA approves of this variance.

VARIANCE / FIELD CHANGE NOTICE

Significant?
(Yes or No): **YES**

V/F: 20803-PSP-0002-04

WBS NO.: PROJECT/DOCUMENT/ECDC #20803-PSP-0002 REV 0

Page: 1 of 3 - **57**

PROJECT TITLE: Project Specific Plan for Area 3A and Area 3B Certification Sampling

Date: 11/23/04

VARIANCE / FIELD CHANGE NOTICE (Include justification):

This Variance documents the collection of four aroclor-1254 (TAL P) samples in Area 3A from CU 1. Two samples from sub-CU 4 and two samples from sub-CU 8 will be collected, due to an above-FRL result at sub-CU 8 and the UCL on the mean for all of CU 1 being greater than the FRL. Samples will be collected from the original sample locations in these sub-CUs where the area was excavated and samples will be collected from an additional random location within each of the sub-CUs. See Figure 1. Additionally, real-time measurements will be taken at each of the two excavated areas.

The sample ID for the physical sample to be collected at the original location in sub-CU 4 shall be identified as A3A-C01-18A¹-P and the sample ID for the physical sample to be collected at another random location in sub-CU 4 shall be identified as A3A-C01-17A¹-P. The sample ID for the physical sample to be collected at the original location in sub-CU 8 shall be identified as A3A-C01-8A¹-P and the sample ID for the physical sample to be collected at another random location in sub-CU 8 shall be identified as A3A-C01-17A¹-P.

Where:

A3A = Area 3A

C01 = CU 1

4, 8, 17, and 18 = Sample Locations within the CU

A = additional sample at this location

1 = depth interval (i.e. 0-0.5 feet)

P = PCB

See Attachment 1 for the TAL and the Sampling and Analytical Requirement.

Surveying required: Yes. Surveyors should survey these locations.

Field QC samples required: No

Field data validation: Yes

Analytical data validation: Yes - VSL D

Off-site data package requirements (if applicable): ASL D

The highest total uranium result for the area is 8.22 mg/kg from boring A3A-C01-4.

Justification:

Certification Unit 1 in Area 3A failed for aroclor-1254 with the UCL on the mean being greater than the FRL; therefore, the two areas where the highest sample results were collected (A3A-C01-4 and A3A-C01-8) were excavated. Following the excavation, it is necessary to sample these locations again as well as an additional random location within each of these sub-CUs to demonstrate that the remainder of the sub-CU is adequately represented. The results of the additional samples taken under this variance will replace the sample results (now excavated) in the performance of the statistics. Per Section 3.4 of the SP, the changes to the PSP will be documented with a V/FCN.

REQUESTED BY: Greg Lupton / Krista Flaugh

Date: 11/23/04

IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
	QUALITY ASSURANCE: R. Fiske <i>Ramon Wessel</i>	11-29-04	X	PROJECT MANAGER: J.D. Ch... <i>[Signature]</i>	11/23/04
	DATA QUALITY MANAGEMENT		X	CHARACTERIZATION MANAGER: F. Miller <i>[Signature]</i>	11/23/04
	ANALYTICAL CUSTOMER SUPPORT: WAO <i>[Signature]</i>	11-30-04		RTDMP Manager	
			X	Sampling Manager: T. Buhlage <i>[Signature]</i>	11/30/04

VARIANCE/FCN APPROVED [X] YES [] NO

REVISION REQUIRED: [] YES [x] NO

DISTRIBUTION

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

CU	Location	Depth (feet)	Sample ID	TAL	Northing	Easting
1	1-4A	0-0.5	A3A-C01-4A^1-P	P	480883.711	1349536.765
	1-8A	0-0.5	A3A-C01-8A^1-P	P	481168.052	1349441.171
	1-17	0-0.5	A3A-C01-17^1-P	P	481174.94	1349474.63
	1-18	0-0.5	A3A-C01-18^1-P	P	480846.92	1349562.22

TAL 20803-PSP-0002-P

Component	MDL
Aroclor-1254	0.013 mg/kg

SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Sample Matrix	Lab	ASL	TAT	Preservative	Holding Time	Container	Sample Volume/Mass
TAL P	Solid	Offstie	D	14 day	Cool 4 degrees C	14 days	Glass with teflon lined lid	100 g (300 g)*

*At the direction of the Field Sampling Lead, triple the specified volume must be collected for all samples at one location in order for the contract laboratory to perform the required quality control analysis.

The samples shall be identified on the Chain of Custody/Request for Analysis forms as "designated for laboratory QC".

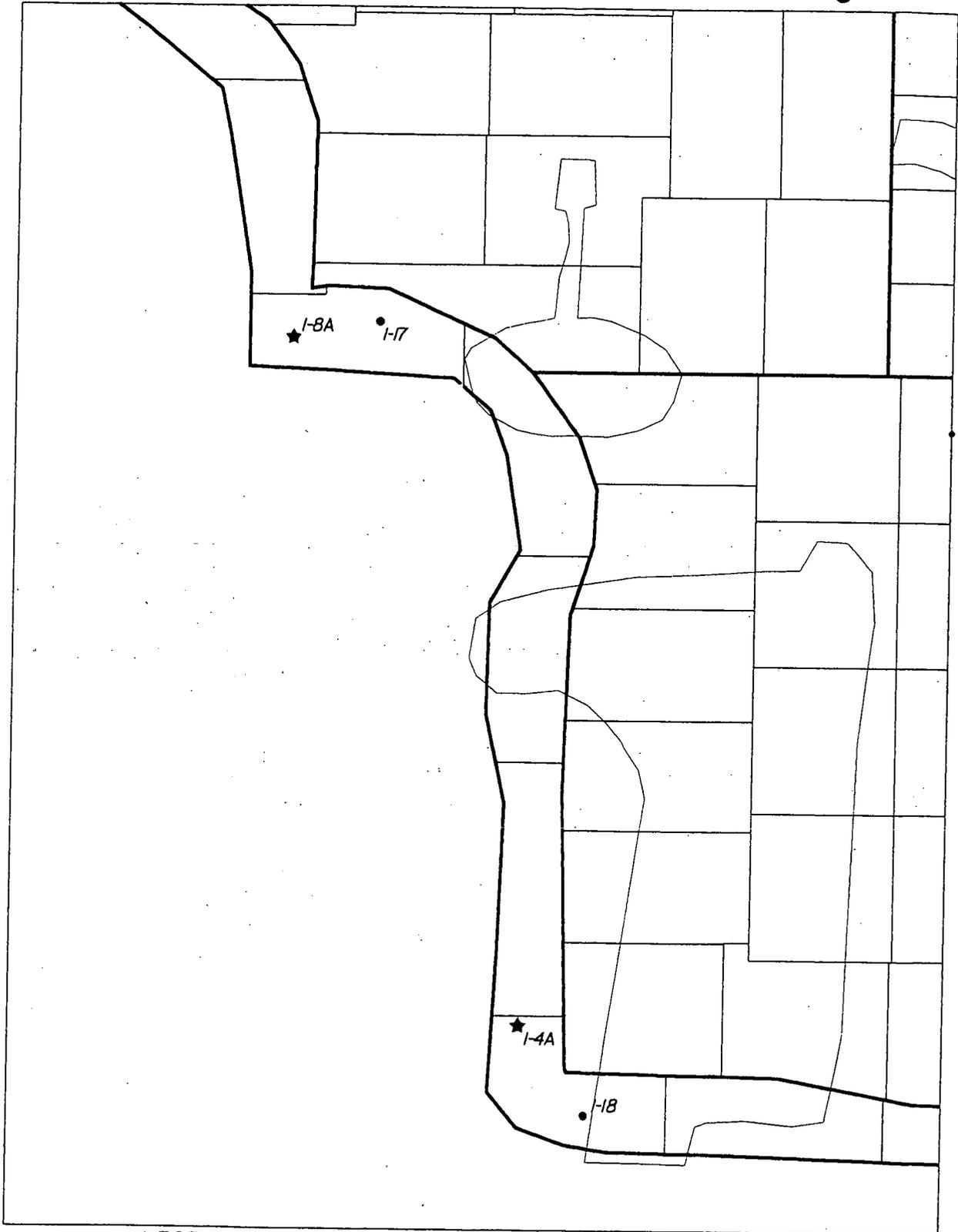
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v:\20 fm\24dgm3d_401.dgn

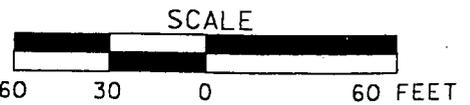
STATE PLANNING COORDINATE SYSTEM 1983

23-NOV-2004



LEGEND:

- RANDOM SAMPLE LOCATION
- ★ ORIGINAL SAMPLE LOCATION



DRAFT

FIGURE 1.



State of Ohio Environmental Protection Agency

Southwest District Office

15-5777

1 East Fifth Street
Columbus, Ohio 43202-2911

TELE: (937) 285-6357 FAX: (937) 285-6404

Bob Taft, Governor
Maureen O'Connor, Lt. Governor
Christopher Jones, Director

MEMO

Post-it® Fax Note	7671	Date	# of pages
To	J.D. Chiou	From	Ohio EPA
Co./Dept		Co.	
Phone #		Phone #	
Fax #	25131	Fax #	

TO: J.D. Chiou

FROM: Donna Bohannon (DB)

DATE: November 23, 2004

SUBJECT: APPROVAL - V/FCN20803-PSP-0002-04 for Project Specific Plan for Area 3A and Area 3B Certification

This V/FCN documents the collection of four samples in Area 3A from CU 1 for arochlor-1254, due to above FRL results. Two samples will be from the excavated area of the original points in sub-CU 4, and two locations will be from sub-CU 8. The additional sample results will determine whether the excavation has removed the above FRL contamination. Ohio EPA approves of this variance.

APPENDIX D

HWMU #20 RCRA CALCULATIONS AND GRAPHS

	Carcinogenic (CA) Non-Carcinogenic (NC)	GCN from Table O-1 mg/kg		Number of COCs (NC vs. CA)	Adjusted GCN mg/kg		Maximum Concentration mg/kg	95% UCL *** on Mean mg/kg
		1 DAF	20 DAF		1 DAF	20 DAF		
Methylene Chloride	CA	0.00114	0.0228	1	0.00114	0.0228	0.0032	0.000761
PCE*	CA	0.00398	0.0795	--	--	--	0.0016	0.000313
Barium **	NC	0.205	4.09	--	--	--	255	--
Lead**	--	--	--	--	--	--	--	--
111-TCA*	NC	0.106	2.12	--	--	--	0.00047	0.000238
Xylenes	NC	0.0811	1.62	1	0.0811	1.62	0.03	0.00527

<u>Carcinogenic</u>			
	$\text{RISK} = \left\{ \left[\frac{\text{Conc A}}{\text{adj GCN A}} \right] + \left[\frac{\text{Conc B}}{\text{adj GCN B}} \right] + \dots \right\} \times 1.00\text{E-}05 = \text{LIMIT OF } 1.00\text{E-}5$		
20 DAF	$\text{RISK} = \left[\frac{\text{methylene chloride } 0.0032}{0.0228} \right] \times 1.00\text{E-}05 = 1.40\text{E-}06$		

<u>Non-Carcinogenic</u>			
	$\text{Hazard Index (1)} = \left[\frac{\text{Conc A}}{\text{adj GCN A}} \right] + \left[\frac{\text{Conc A}}{\text{adj GCN A}} \right] = \text{LIMIT OF } 1.00$		
20 DAF	$\text{Hazard Index (1)} = \left[\frac{\text{Xylenes } 0.030}{1.62} \right] = 0.0185$		

- * PCE and 1,1,1-TCA are eliminated from the COC list because the frequency of detection is less than 5%
- ** Barium is eliminated from the COC list because the maximum concentration is less than the site-specific maximum background value of 261 mg/kg and Lead does not have a GCN.
- *** 95% UCL on the mean based on using 1/2 of the minimum detected result for all non-detected results

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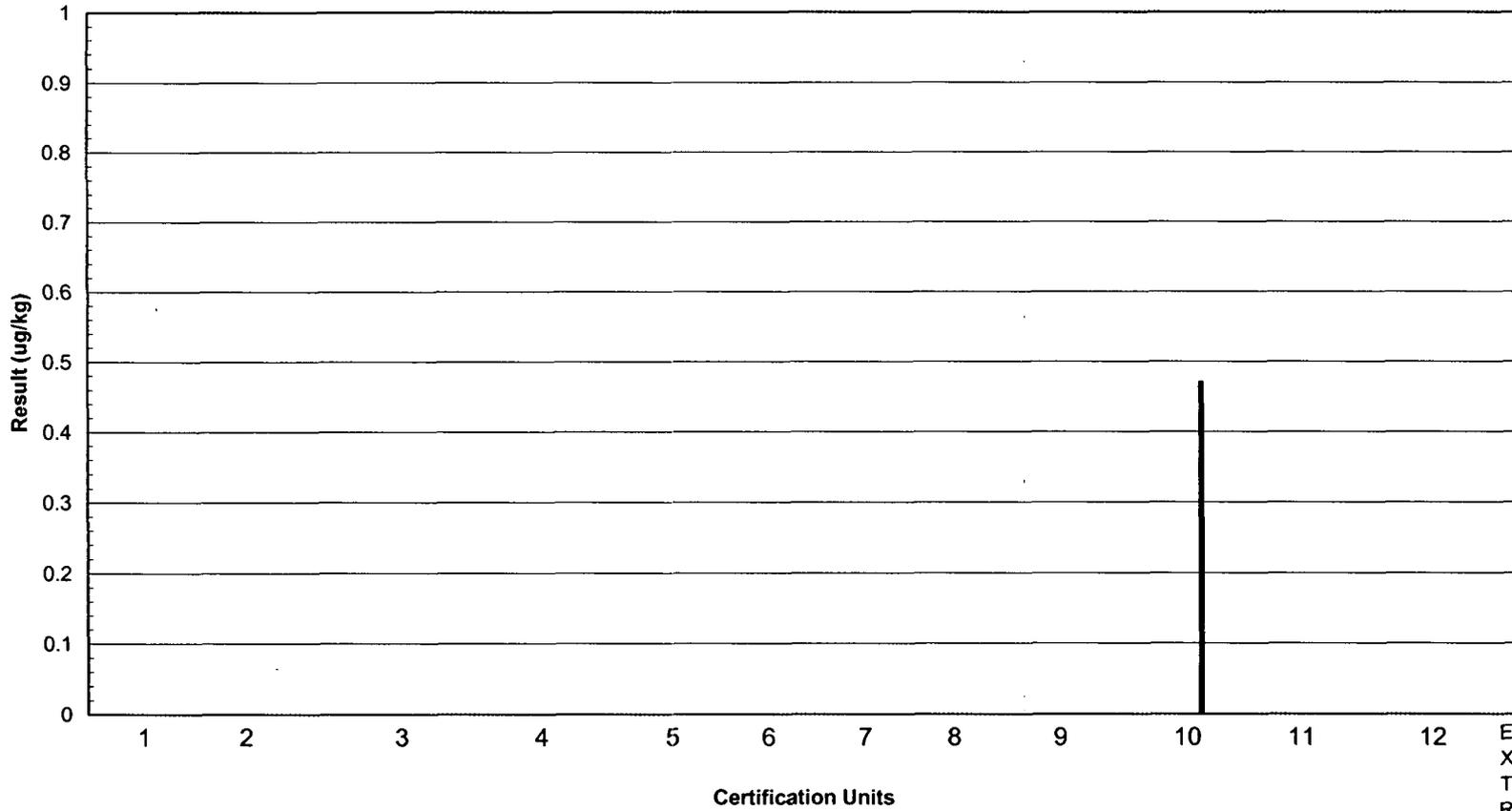
HWMU20 1,1,1-Trichloroethane-detected results

Soil GCN =
1,000,000 ug/kg

Soil FRL =
4,300 ug/kg*

GW (20 DAF) =
2,120 ug/kg

GW (1 DAF) =
106 ug/kg

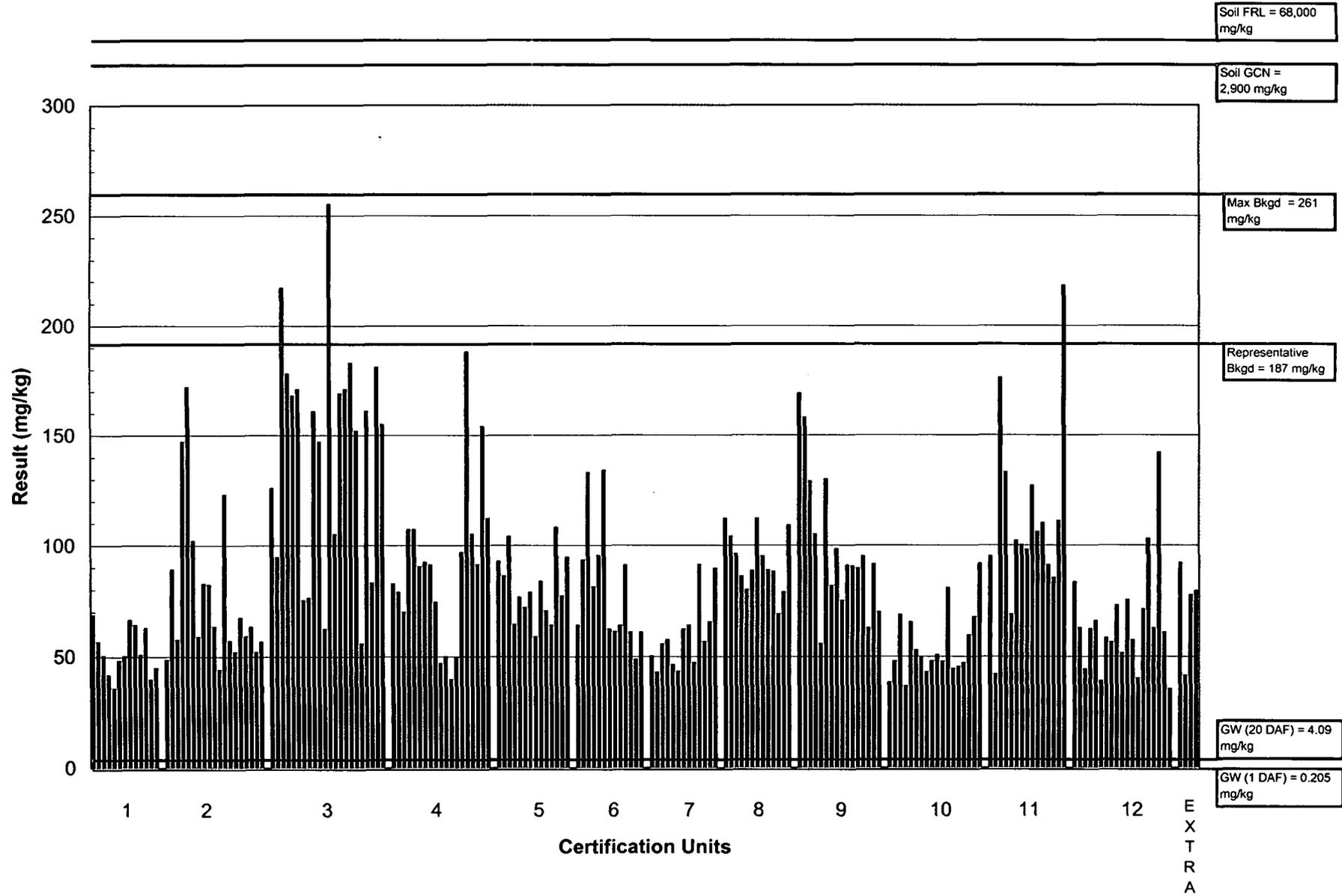


E
X
T
R
A

*Soil FRL is based on the FRL for 1,1,2-Trichloroethane.

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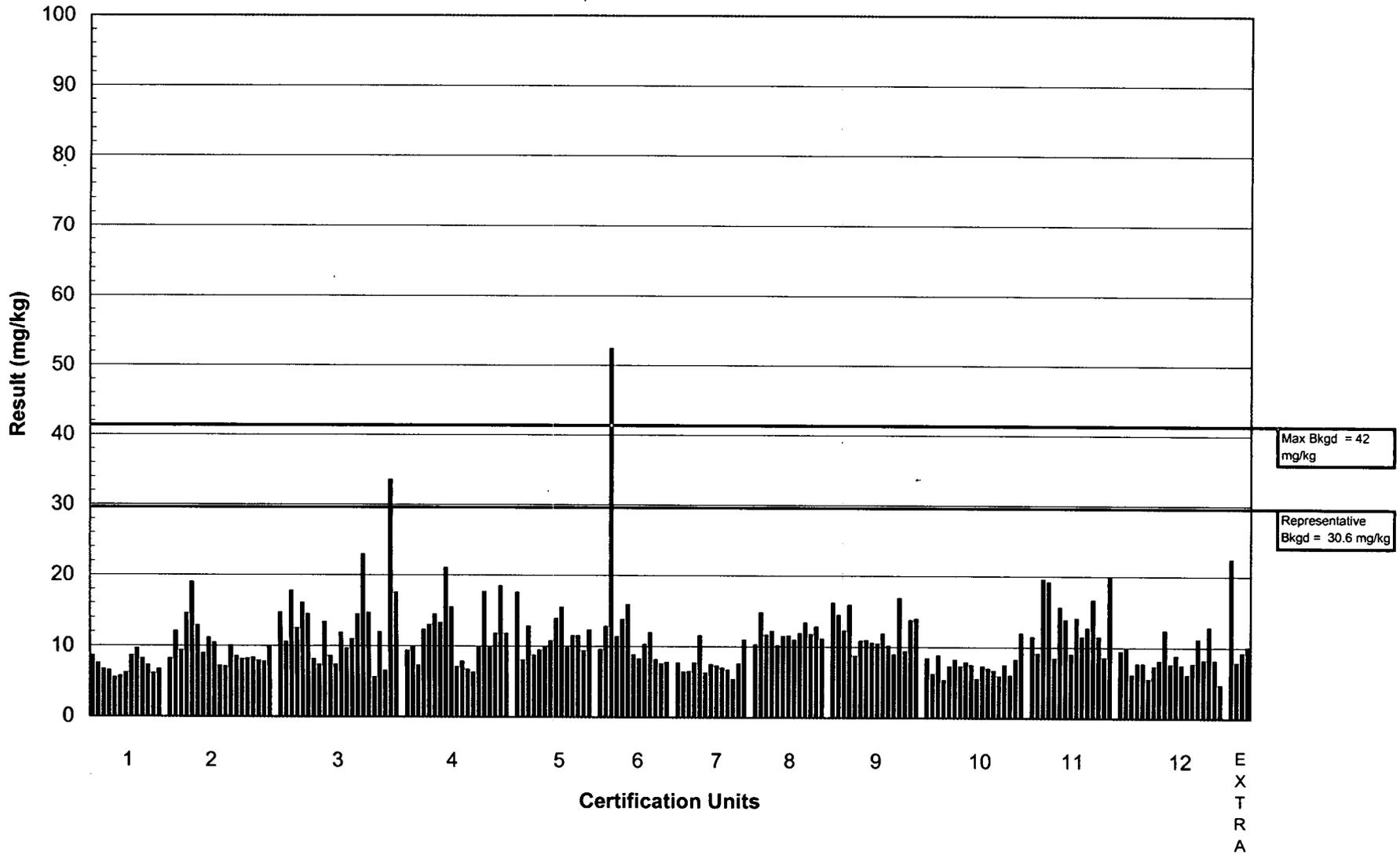
HWMU20 Barium-detected results



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HWMU20 Lead-detected results

Soil FRL =
400 mg/kg

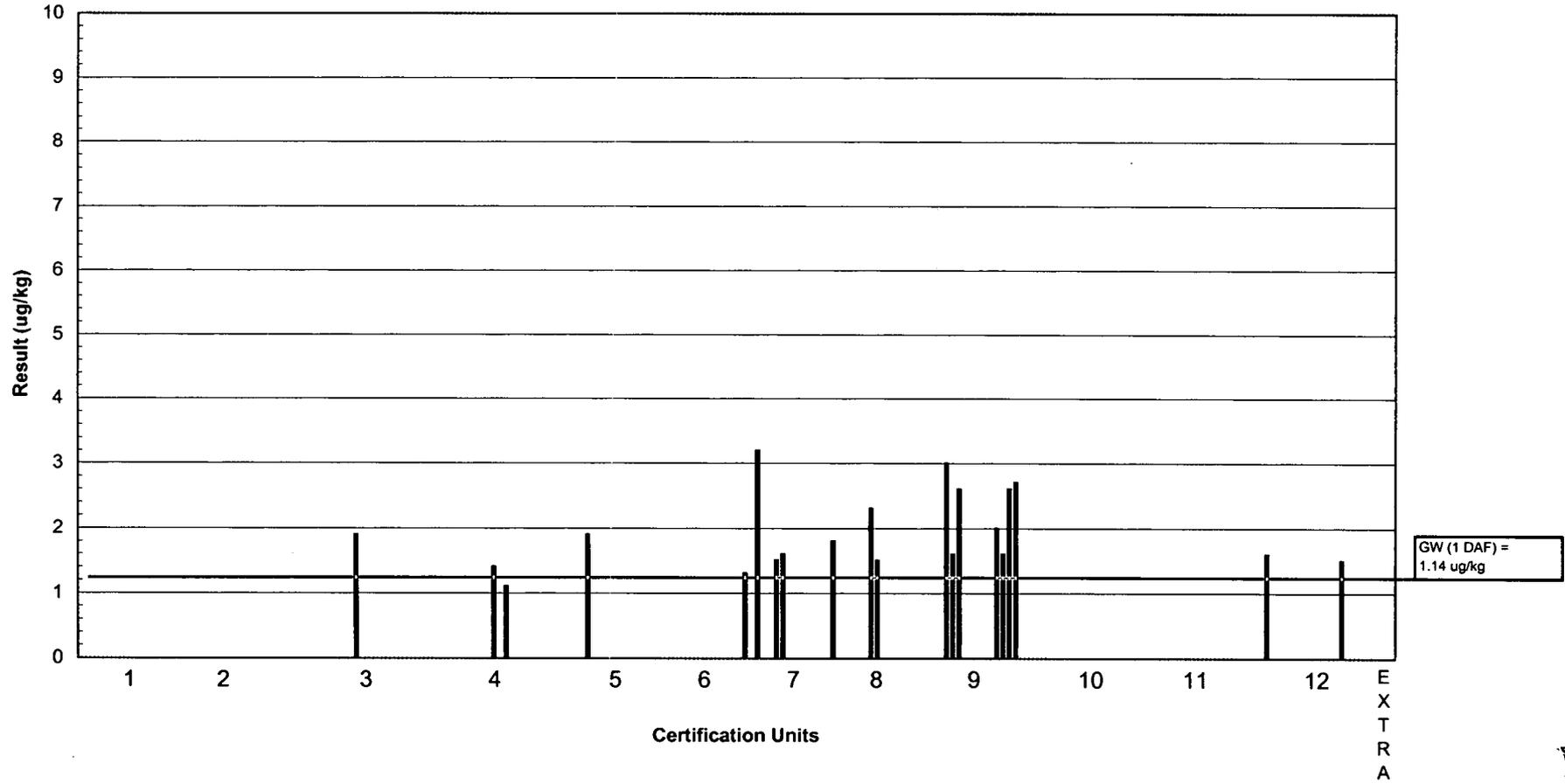


HWMU20 Methylene chloride-detected results

Soil GCN =
85,000 ug/kg

Soil FRL =
37,000 ug/kg

GW (20 DAF) =
22.8 ug/kg



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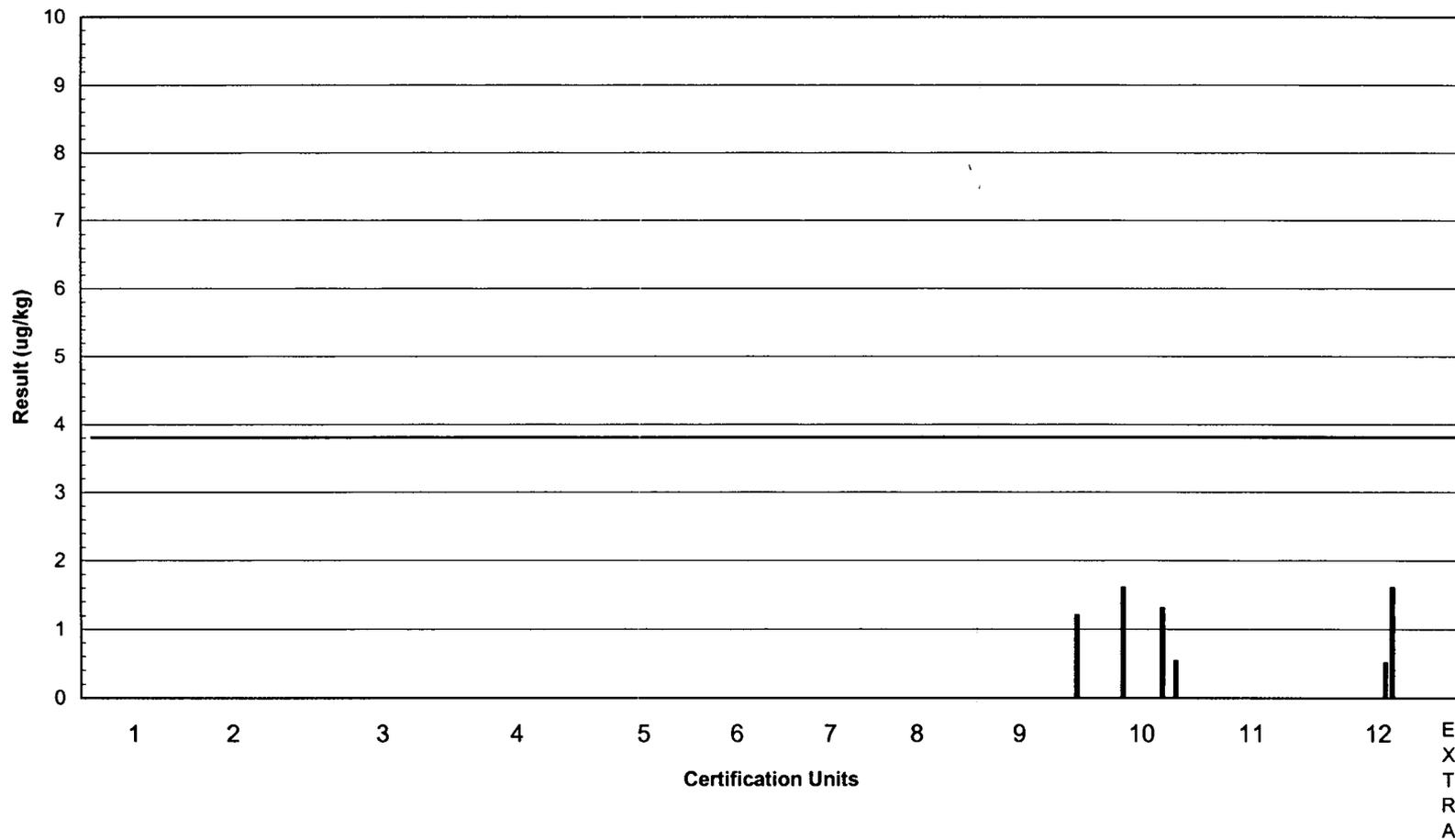
HWMU20 Tetrachloroethene-detected results

Soil GCN =
45,300 ug/kg

Soil FRL =
3,600 ug/kg

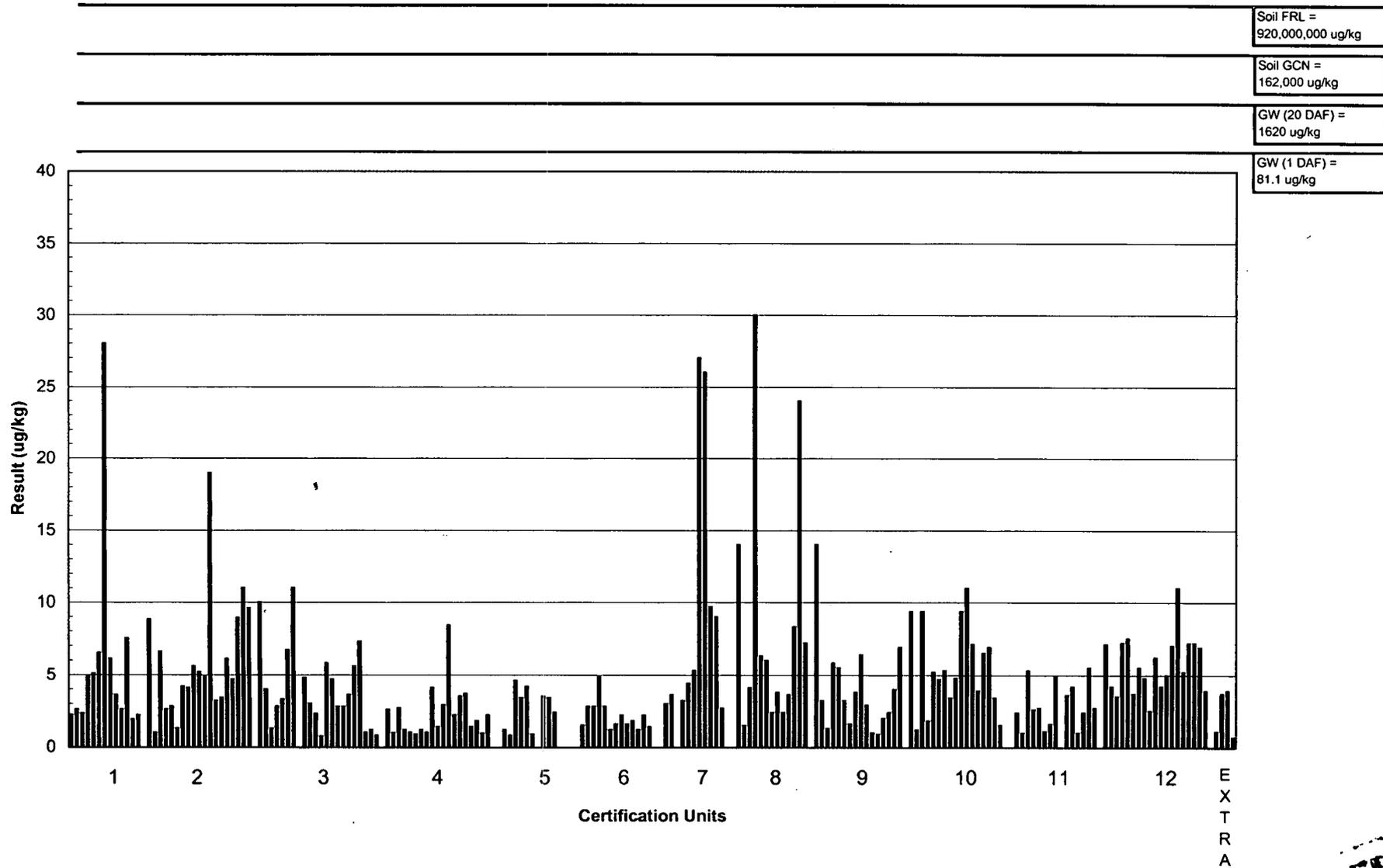
GW (20 DAF) =
79.5 ug/kg

GW (1 DAF) =
3.98 ug/kg



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HWMU20 Xylenes, Total-detected results



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