

0096777

SAF-RC-040
300 Area D4 Waste Characterization
Sampling - Other Solid
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

No Distribution Required

KW 5/19/11
INITIAL/DATE

COMMENTS:

SDG K3305

SAF-RC-040

Rad only

Chem only

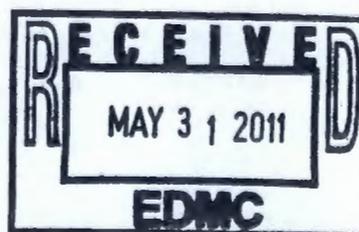
Rad & Chem

Complete

Partial

INCLUDES ADD-ON RAD DATA

Sample Location/Waste Site: 309 – Bio Shield





EBERLINE SERVICES

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May 13, 2011

Ms. Joan Kessner
Washington Closure Hanford
2620 Fermi Avenue
MSIN H4-21
Richland, WA 99352

Reference: **P.O. #S00W235A00**
Eberline Analytical S1-04-086-7842, SDG K3305
S1-05-001-7842

Dear Ms. Kessner:

Enclosed is the data report for one solid (other solid) sample designated under SAF No. RC-040 received at Eberline Analytical on April 19, 2011. The received sample consisted of a chunk of concrete and two pieces of steel plate. After discussing with WCH, instructions were given to analyze the concrete and steel as separate samples. The steel was given a sample ID of J1HH93-A. The samples were analyzed according to the accompanying chain-of-custody document, and results were reported on April 28, 2011. On May 4, 2011 orders were received from WCH to perform total strontium, Ni-63, and Pu-241 analyses for both the concrete and the steel; results for those analyses are reported herein.

Please call if you have any questions concerning this report.

Sincerely,

N. Joseph Verville
Client Services Manager

NJV/jag

Enclosure: Data Package

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K3305 was composed of two solid (other solid) samples designated under SAF No. RC-040 with a Project Designation of: 300 Area D4 Waste Characterization Sampling – Other Solid.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist. The creation of sample J1HH93-A was performed at EAC and is not listed on the COC document. The results were transmitted to WCH via e-mail on April 28, 2011.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analysis

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.5 Isotopic Plutonium Analysis

The alpha Pu analysis was repeated because the added beta Pu-241 analysis is a continuation of the alpha Pu analysis. The final plating solution from the alpha Pu chemistry was split prior to electroplating; half the solution was plated for alpha counting and the other half was used to prepare the beta Pu-241 planchet. As a consequence of the sample split, the yields are low and the resultant MDA's are greater than the RDL. No problems were encountered during the course of the analyses.

2.6 Plutonium-241 Analysis

No problems were encountered during the course of the analyses.

2.7 Americium-241 Analysis

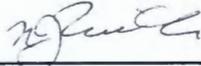
No problems were encountered during the course of the analyses.

2.8 Gamma Spectroscopy

The relative percent difference in the original and duplicate Am-241 results was 50% and the DER was 4.5. No other problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."



N. Joseph Verville
Client Services Manager

5/13/11

Date

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K3305

SDG 7842
Contact N. Joseph Verville

Client Hanford
Contract No. S00W235A00
Case no SDG_K3305

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

| | | |
|---------------------|---------|----|
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Christopher Pahlman
Prepared by

302
Reviewed by

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 05/13/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3305

SDG 7842
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K3305

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 1

Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/13/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3305

SDG 7842
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG K3305

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

LAB SAMPLE SUMMARY

SDG 7842
 Contact N. Joseph Verville

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3305

| LAB SAMPLE ID | CLIENT SAMPLE ID | LOCATION | MATRIX | LEVEL | SAF NO | CHAIN OF CUSTODY | COLLECTED |
|------------------|------------------------|----------------|--------|-------|--------|---------------------|----------------|
| S104086-01 | JLHH93 (CONCRETE) | 309-Bio Shield | SOLID | | RC-040 | RC-040-609 | 04/12/11 15:00 |
| S104086-02 | Lab Control Sample | | SOLID | | RC-040 | | |
| S104086-03 | Method Blank | | SOLID | | RC-040 | | |
| S104086-04 | Duplicate (S104086-01) | 309-Bio Shield | SOLID | | RC-040 | | 04/12/11 15:00 |
| S104086-05 | JLHH93-A (STEEL) | 309-Bio Shield | SOLID | | RC-040 | RC-040-609 | 04/12/11 15:00 |
| S104086-06 | Lab Control Sample | | SOLID | | RC-040 | | |
| S104086-07 | Method Blank | | SOLID | | RC-040 | | |
| S104086-08 | Duplicate (S104086-01) | 309-Bio Shield | SOLID | | RC-040 | | 04/12/11 15:00 |
| S104086-09 | Lab Control Sample | | SOLID | | RC-040 | | |
| S104086-10 | Method Blank | | SOLID | | RC-040 | | |
| S104086-11 | Duplicate (S104086-01) | 309-Bio Shield | SOLID | | RC-040 | | 04/12/11 15:00 |

LAB SUMMARY

Page 1

SUMMARY DATA SECTION

Page 3

Lab id EBRLNE
 Protocol RC-040
 Version Ver 1.0
 Form DVD-LS
 Version 3.06
 Report date 05/13/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

SDG 7842
 Contact N.Joseph Verville

QC SUMMARY

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3305

| QC BATCH | CHAIN OF CUSTODY | CLIENT SAMPLE ID | MATRIX | % SOLIDS | SAMPLE AMOUNT | BASIS AMOUNT | DAYS SINCE RECEIVED | LAB COLL SAMPLE ID | DEPARTMENT SAMPLE ID |
|----------|------------------|------------------------|--------|----------|---------------|--------------|---------------------|--------------------|----------------------|
| 7842 | RC-040-609 | J1HH93 (CONCRETE) | SOLID | 100.0 | 1241 g | | 04/19/11 7 | S104086-01 | 7842-001 |
| | | J1HH93-A (STEEL) | SOLID | 100.0 | 1350 g | | 04/18/11 6 | S104086-05 | 7842-005 |
| | | Method Blank | SOLID | | | | | S104086-03 | 7842-003 |
| | | Method Blank | SOLID | | | | | S104086-07 | 7842-007 |
| | | Method Blank | SOLID | | | | | S104086-10 | 7842-010 |
| | | Lab Control Sample | SOLID | | | | | S104086-02 | 7842-002 |
| | | Lab Control Sample | SOLID | | | | | S104086-06 | 7842-006 |
| | | Lab Control Sample | SOLID | | | | | S104086-09 | 7842-009 |
| | | Duplicate (S104086-01) | SOLID | 100.0 | 1241 g | | 04/19/11 7 | S104086-04 | 7842-004 |
| | | Duplicate (S104086-01) | SOLID | 100.0 | 1241 g | | 04/19/11 7 | S104086-08 | 7842-008 |
| | | Duplicate (S104086-01) | SOLID | 100.0 | 1241 g | | 04/19/11 7 | S104086-11 | 7842-011 |

QC SUMMARY

Page 1

SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol RC-040
 Version Ver 1.0
 Form DVD-QS
 Version 3.06
 Report date 05/13/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

SDG 7842
 Contact N.Joseph Verville

PREP BATCH SUMMARY

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3305

| TEST | MATRIX | METHOD | PREPARATION ERROR | | PLANCHETS ANALYZED | | | QUALI- FIERS | |
|--------------------------------------|--------|-------------------------------|-------------------|------|--------------------|------|----------|-----------------|-----|
| | | | BATCH | 2σ % | CLIENT | MORE | RE BLANK | | LCS |
| Alpha Spectroscopy | | | | | | | | | |
| AM | SOLID | Americium 241 in Solids | 7287-098 | 8.0 | 2 | | 1 | 1 | 1/1 |
| PU | SOLID | Plutonium, Isotopic in Solids | 7287-099 | 8.0 | 2 | | 1 | 1 | 1/1 |
| Beta Counting | | | | | | | | | |
| SR | SOLID | Total Strontium in Solids | 7287-099 | 10.4 | 2 | | 1 | 1 | 1/1 |
| Gamma Spectroscopy | | | | | | | | | |
| GAM | SOLID | Gamma Scan | 7287-098 | 7.0 | 2 | | 1 | 1 | 1/1 |
| Liquid Scintillation Counting | | | | | | | | | |
| C | SOLID | Carbon 14 in Solids | 7287-098 | 10.0 | 2 | | 1 | 1 | 1/1 |
| H | SOLID | Tritium in Solids | 7287-098 | 10.0 | 2 | | 1 | 1 | 1/1 |
| NI_L | SOLID | Nickel 63 in Solids | 7287-099 | 11.2 | 2 | | 1 | 1 | 1/1 |
| PU_L | SOLID | Plutonium 241 in Solids | 7287-099 | 12.4 | 2 | | 1 | 1 | 1/1 |

Duplicates and Spikes are those with original sample in the QC Batch of some Client sample in this SDG.
 Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
 Protocol RC-040
 Version Ver 1.0
 Form DVD-PBS
 Version 3.06
 Report date 05/13/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

SDG 7842
 Contact N. Joseph Verville

LAB WORK SUMMARY

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3305

| LAB SAMPLE | CLIENT SAMPLE ID | | | | | | | | | | |
|------------|------------------------|--------|----------|------|------|----------|----------|-----|-------------------------------|--|--|
| COLLECTED | LOCATION | MATRIX | | | SUF- | | | | | | |
| RECEIVED | CUSTODY | SAF No | PLANCHET | TEST | FIX | ANALYZED | REVIEWED | BY | METHOD | | |
| S104086-01 | J1HH93 (CONCRETE) | | 7842-001 | AM | | 04/26/11 | 04/26/11 | BW | Americium 241 in Solids | | |
| 04/12/11 | 309-Bio Shield | SOLID | 7842-001 | C | | 04/22/11 | 04/26/11 | BW | Carbon 14 in Solids | | |
| 04/19/11 | RC-040-609 | RC-040 | 7842-001 | GAM | | 04/21/11 | 04/26/11 | MWT | Gamma Scan | | |
| | | | 7842-001 | H | | 04/24/11 | 04/27/11 | BW | Tritium in Solids | | |
| | | | 7842-001 | NI_L | A1 | 05/10/11 | 05/12/11 | BW | Nickel 63 in Solids | | |
| | | | 7842-001 | PU | A1 | 05/11/11 | 05/12/11 | BW | Plutonium, Isotopic in Solids | | |
| | | | 7842-001 | PU_L | A1 | 05/11/11 | 05/12/11 | BW | Plutonium 241 in Solids | | |
| | | | 7842-001 | SR | | 05/04/11 | 05/06/11 | BW | Total Strontium in Solids | | |
| S104086-02 | Lab Control Sample | | 7842-002 | AM | | 04/26/11 | 04/26/11 | BW | Americium 241 in Solids | | |
| | | SOLID | 7842-002 | C | | 04/22/11 | 04/26/11 | BW | Carbon 14 in Solids | | |
| | | RC-040 | 7842-002 | GAM | | 04/21/11 | 04/26/11 | MWT | Gamma Scan | | |
| | | | 7842-002 | H | | 04/25/11 | 04/27/11 | BW | Tritium in Solids | | |
| S104086-03 | Method Blank | | 7842-003 | AM | | 04/26/11 | 04/26/11 | BW | Americium 241 in Solids | | |
| | | SOLID | 7842-003 | C | | 04/22/11 | 04/26/11 | BW | Carbon 14 in Solids | | |
| | | RC-040 | 7842-003 | GAM | | 04/21/11 | 04/26/11 | MWT | Gamma Scan | | |
| | | | 7842-003 | H | | 04/24/11 | 04/27/11 | BW | Tritium in Solids | | |
| S104086-04 | Duplicate (S104086-01) | | 7842-004 | AM | | 04/26/11 | 04/26/11 | BW | Americium 241 in Solids | | |
| 04/12/11 | 309-Bio Shield | SOLID | 7842-004 | C | | 04/22/11 | 04/26/11 | BW | Carbon 14 in Solids | | |
| 04/19/11 | | RC-040 | 7842-004 | GAM | | 04/21/11 | 04/26/11 | MWT | Gamma Scan | | |
| | | | 7842-004 | H | | 04/24/11 | 04/27/11 | BW | Tritium in Solids | | |
| S104086-05 | J1HH93-A (STEEL) | | 7842-005 | AM | | 04/26/11 | 04/26/11 | BW | Americium 241 in Solids | | |
| 04/12/11 | 309-Bio Shield | SOLID | 7842-005 | C | | 04/22/11 | 04/26/11 | BW | Carbon 14 in Solids | | |
| 04/18/11 | RC-040-609 | RC-040 | 7842-005 | GAM | | 04/21/11 | 04/26/11 | MWT | Gamma Scan | | |
| | | | 7842-005 | H | | 04/24/11 | 04/27/11 | BW | Tritium in Solids | | |
| | | | 7842-005 | NI_L | A1 | 05/10/11 | 05/12/11 | BW | Nickel 63 in Solids | | |
| | | | 7842-005 | PU | A1 | 05/11/11 | 05/12/11 | BW | Plutonium, Isotopic in Solids | | |
| | | | 7842-005 | PU_L | A1 | 05/11/11 | 05/12/11 | BW | Plutonium 241 in Solids | | |
| | | | 7842-005 | SR | | 05/04/11 | 05/06/11 | BW | Total Strontium in Solids | | |
| S104086-06 | Lab Control Sample | | 7842-006 | SR | | 05/04/11 | 05/06/11 | BW | Total Strontium in Solids | | |
| | | SOLID | | | | | | | | | |
| | | RC-040 | | | | | | | | | |

WORK SUMMARY

Page 1

SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol RC-040
 Version Ver 1.0
 Form DVD-LWS
 Version 3.06
 Report date 05/13/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

SDG 7842
 Contact N. Joseph Verville

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3305

WORK SUMMARY, cont.

| LAB SAMPLE | CLIENT SAMPLE ID | MATRIX | SUF- | RECEIVED | COLLECTED | LOCATION | SAF No | PLANCHET | TEST | FIX | ANALYZED | REVIEWED | BY | METHOD |
|------------|------------------------|--------|------|----------|-----------|----------------|----------|----------|------|-----|----------|----------|----|-------------------------------|
| S104086-07 | Method Blank | SOLID | SR | | | | 7842-007 | | | | 05/04/11 | 05/06/11 | BW | Total Strontium in Solids |
| | | RC-040 | | | | | | | | | | | | |
| S104086-08 | Duplicate (S104086-01) | SOLID | SR | | 04/12/11 | 309-Bio Shield | 7842-008 | | | | 05/04/11 | 05/06/11 | BW | Total Strontium in Solids |
| | | RC-040 | | 04/19/11 | | | | | | | | | | |
| S104086-09 | Lab Control Sample | SOLID | NI_L | | | | 7842-009 | | | | 05/10/11 | 05/12/11 | BW | Nickel 63 in Solids |
| | | RC-040 | PU | | | | 7842-009 | | | | 05/11/11 | 05/12/11 | BW | Plutonium, Isotopic in Solids |
| | | | PU_L | | | | 7842-009 | | | | 05/11/11 | 05/12/11 | BW | Plutonium 241 in Solids |
| S104086-10 | Method Blank | SOLID | NI_L | | | | 7842-010 | | | | 05/10/11 | 05/12/11 | BW | Nickel 63 in Solids |
| | | RC-040 | PU | | | | 7842-010 | | | | 05/11/11 | 05/12/11 | BW | Plutonium, Isotopic in Solids |
| | | | PU_L | | | | 7842-010 | | | | 05/11/11 | 05/12/11 | BW | Plutonium 241 in Solids |
| S104086-11 | Duplicate (S104086-01) | SOLID | NI_L | | 04/12/11 | 309-Bio Shield | 7842-011 | | | | 05/10/11 | 05/12/11 | BW | Nickel 63 in Solids |
| | | RC-040 | PU | 04/19/11 | | | 7842-011 | | | | 05/11/11 | 05/12/11 | BW | Plutonium, Isotopic in Solids |
| | | | PU_L | | | | 7842-011 | | | | 05/11/11 | 05/12/11 | BW | Plutonium 241 in Solids |

COUNTS OF TESTS BY SAMPLE TYPE

| TEST | SAF No | METHOD | REFERENCE | CLIENT | MORE | RE | BLANK | LCS | DUP SPIKE | TOTAL |
|---------------|--------|-------------------------------|----------------------|-----------|------|----|----------|----------|-----------|-----------|
| AM | RC-040 | Americium 241 in Solids | AMCMISO_IE_PLATE_AEA | 2 | | | 1 | 1 | 1 | 5 |
| C | RC-040 | Carbon 14 in Solids | C14_COX_LSC | 2 | | | 1 | 1 | 1 | 5 |
| GAM | RC-040 | Gamma Scan | GAMMA_GS | 2 | | | 1 | 1 | 1 | 5 |
| H | RC-040 | Tritium in Solids | TRITIUM_COX_LSC | 2 | | | 1 | 1 | 1 | 5 |
| NI_L | RC-040 | Nickel 63 in Solids | NI63_LSC | 2 | | | 1 | 1 | 1 | 5 |
| PU | RC-040 | Plutonium, Isotopic in Solids | PUISO_PLATE_AEA | 2 | | | 1 | 1 | 1 | 5 |
| PU_L | RC-040 | Plutonium 241 in Solids | PU241_IE_LSC | 2 | | | 1 | 1 | 1 | 5 |
| SR | RC-040 | Total Strontium in Solids | SRTOT_SEP_PRECIP_GPC | 2 | | | 1 | 1 | 1 | 5 |
| TOTALS | | | | 16 | | | 8 | 8 | 8 | 40 |

WORK SUMMARY

Page 2

SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol RC-040
 Version Ver 1.0
 Form DVD-LWS
 Version 3.06
 Report date 05/13/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3305

7842-003

Method Blank

METHOD BLANK

| | | |
|----------------------------------|--------------------------------------|------------------|
| SDG <u>7842</u> | Client/Case no <u>Hanford</u> | <u>SDG K3305</u> |
| Contact <u>N.Joseph Verville</u> | Contract No. <u>S00W235A00</u> | |
| Lab sample id <u>S104086-03</u> | Client sample id <u>Method Blank</u> | |
| Dept sample id <u>7842-003</u> | Material/Matrix <u>SOLID</u> | |
| | SAF No <u>RC-040</u> | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI- FIERS | TEST |
|---------------|------------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Tritium | 10028-17-8 | 9.68 | 46 | 79.4 | 400 | U | H |
| Carbon 14 | 14762-75-5 | 20.9 | 43 | 72.2 | 50.0 | U | C |
| Americium 241 | 14596-10-2 | 0 | 3.9 | 9.44 | 1.00 | U | AM |
| Potassium 40 | 13966-00-2 | U | | 63.5 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 4.93 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 3.89 | 0.100 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 10.2 | 0.100 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 17.6 | 0.200 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 14.2 | 0.100 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 12.4 | 0.100 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 8.88 | 0.100 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 8.52 | | U | GAM |
| Thorium 232 | TH-232 | U | | 17.6 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 24.6 | | U | GAM |
| Uranium-238 | U-238 | U | | 498 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 4.48 | | U | GAM |
| Antimony 125 | 14234-35-6 | U | | 11.4 | | U | GAM |
| Barium-133 | 13981-41-4 | U | | 5.19 | | U | GAM |
| Niobium 94 | 14681-63-1 | U | | 4.05 | | U | GAM |

QC-BLANK #78246

| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>RC-040</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-DS</u> |
| Version <u>3.06</u> |
| Report date <u>05/13/11</u> |

METHOD BLANKS

Page 1

SUMMARY DATA SECTION

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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3305

7842-007

Method Blank

METHOD BLANK

| | | |
|----------------------------------|--------------------------------------|------------------|
| SDG <u>7842</u> | Client/Case no <u>Hanford</u> | <u>SDG K3305</u> |
| Contact <u>N.Joseph Verville</u> | Contract No. <u>S00W235A00</u> | |
| Lab sample id <u>S104086-07</u> | Client sample id <u>Method Blank</u> | |
| Dept sample id <u>7842-007</u> | Material/Matrix <u>SOLID</u> | |
| | SAF No <u>RC-040</u> | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI- FIERS | TEST |
|-----------------|--------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Total Strontium | SR-RAD | -0.112 | 0.39 | 0.754 | 1.00 | U | SR |

QC-BLANK #78365

METHOD BLANKS

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SUMMARY DATA SECTION

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| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>RC-040</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-DS</u> |
| Version <u>3.06</u> |
| Report date <u>05/13/11</u> |

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3305

7842-010

Method Blank

METHOD BLANK

| | | |
|----------------------------------|--------------------------------------|------------------|
| SDG <u>7842</u> | Client/Case no <u>Hanford</u> | <u>SDG K3305</u> |
| Contact <u>N.Joseph Verville</u> | Contract No. <u>S00W235A00</u> | |
| Lab sample id <u>S104086-10</u> | Client sample id <u>Method Blank</u> | |
| Dept sample id <u>7842-010</u> | Material/Matrix <u>SOLID</u> | |
| | SAF No <u>RC-040</u> | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI- FIERS | TEST |
|-------------------|------------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Nickel 63 | 13981-37-8 | 1.94 | 4.4 | 7.42 | 30.0 | U | NI_L |
| Plutonium 238 | 13981-16-3 | 0 | 0.58 | <u>2.21</u> | 1.00 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.289 | 0.58 | <u>2.21</u> | 1.00 | U | PU |
| Plutonium 241 | 14119-32-5 | -13.4 | 24 | <u>40.2</u> | 15.0 | U | PU_L |

QC-BLANK #78382

| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>RC-040</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-DS</u> |
| Version <u>3.06</u> |
| Report date <u>05/13/11</u> |

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

7842-006

Lab Control Sample

LAB CONTROL SAMPLE

| | |
|---|--|
| SDG <u>7842</u> Contact <u>N. Joseph Verville</u> Lab sample id <u>S104086-06</u> Dept sample id <u>7842-006</u> | Client/Case no <u>Hanford</u> <u>SDG K3305</u> Contract <u>No. S00W235A00</u> Client sample id <u>Lab Control Sample</u> Material/Matrix <u>SOLID</u> SAF No <u>RC-040</u> |
|---|--|

| ANALYTE | RESULT | 2σ ERR | MDA | RDL | QUALI- | ADDED | 2σ ERR | REC | 3σ | LMTS | PROTOCOL |
|-----------------|--------|---------|-------|-------|--------|-------|--------|------|---------|--------|----------|
| | pCi/g | (COUNT) | pCi/g | pCi/g | FIERS | TEST | pCi/g | % | (TOTAL) | LIMITS | |
| Total Strontium | 19.4 | 1.1 | 0.495 | 1.00 | | SR | 17.4 | 0.70 | 112 | 79-121 | 80-120 |

QC-LCS #78364

| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>RC-040</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-LCS</u> |
| Version <u>3.06</u> |
| Report date <u>05/13/11</u> |

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

7842-009

Lab Control Sample

LAB CONTROL SAMPLE

| | |
|---|--|
| SDG <u>7842</u> Contact <u>N. Joseph Verville</u> Lab sample id <u>S104086-09</u> Dept sample id <u>7842-009</u> | Client/Case no <u>Hanford</u> SDG <u>K3305</u> Contract No. <u>S00W235A00</u> Client sample id <u>Lab Control Sample</u> Material/Matrix <u>SOLID</u> SAF No <u>RC-040</u> |
|---|--|

| ANALYTE | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI- FIERS TEST | ADDED pCi/g | 2σ ERR pCi/g | REC % | 3σ LMTS (TOTAL) | PROTOCOL LIMITS |
|-------------------|-----------------|-------------------|--------------|--------------|-------------------------|----------------|-----------------|----------|--------------------|--------------------|
| Nickel 63 | 488 | 14 | 7.48 | 30.0 | NI_L | 540 | 22 | 90 | 83-117 | 80-120 |
| Plutonium 238 | 31.4 | 5.6 | <u>1.43</u> | 1.00 | PU | 34.3 | 1.4 | 92 | 72-128 | 80-120 |
| Plutonium 239/240 | 38.5 | 6.2 | <u>1.43</u> | 1.00 | PU | 39.6 | 1.6 | 97 | 73-127 | 80-120 |
| Plutonium 241 | 752 | 34 | <u>35.6</u> | 15.0 | PU_L | 790 | 32 | 95 | 80-120 | 80-120 |

QC-LCS #78381

| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>RC-040</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-LCS</u> |
| Version <u>3.06</u> |
| Report date <u>05/13/11</u> |

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

7842-004

J1HH93 (CONCRETE)

DUPLICATE

| | | | |
|----------------------------------|---------------------------------|---|------------------|
| SDG <u>7842</u> | | Client/Case no <u>Hanford</u> | SDG <u>K3305</u> |
| Contact <u>N.Joseph Verville</u> | | Contract No. <u>S00W235A00</u> | |
| DUPLICATE | ORIGINAL | | |
| Lab sample id <u>S104086-04</u> | Lab sample id <u>S104086-01</u> | Client sample id <u>J1HH93 (CONCRETE)</u> | |
| Dept sample id <u>7842-004</u> | Dept sample id <u>7842-001</u> | Location/Matrix <u>309-Bio Shield</u> | <u>SOLID</u> |
| | Received <u>04/19/11</u> | Collected/Weight <u>04/12/11 15:00</u> | <u>1241 g</u> |
| % solids <u>100.0</u> | % solids <u>100.0</u> | Custody/SAF No <u>RC-040-609</u> | <u>RC-040</u> |

| ANALYTE | DUPLICATE | 2σ ERR | MDA | RDL | QUALI- | ORIGINAL | 2σ ERR | MDA | QUALI- | RPD | 3σ | DER | |
|---------------|-----------|---------|--------------|-------|--------|----------|--------|-------|--------------|-------|-----------|-----------|------------|
| | pCi/g | (COUNT) | pCi/g | pCi/g | FIERS | | TEST | pCi/g | (COUNT) | pCi/g | FIERS | % | TOT |
| Tritium | 1410 | 18 | 4.43 | 400 | | H | 1600 | 19 | 4.35 | | 13 | 21 | 1.8 |
| Carbon 14 | 4.33 | 3.4 | 5.45 | 50.0 | U | C | 8.87 | 3.5 | 5.51 | | 69 | 113 | 1.8 |
| Americium 241 | 1.31 | 0.66 | 0.783 | 1.00 | | AM | 0.919 | 0.79 | 1.00 | U | 35 | 140 | 0.8 |
| Potassium 40 | U | | 1.80 | | U | GAM | U | | 2.08 | U | - | | 0.2 |
| Cobalt 60 | 31.2 | 0.29 | <u>0.169</u> | 0.050 | | GAM | 31.2 | 0.33 | <u>0.199</u> | | 0 | 15 | 0 |
| Cesium 137 | 15.6 | 0.22 | <u>0.250</u> | 0.100 | | GAM | 14.7 | 0.24 | <u>0.287</u> | | 6 | 15 | 1.2 |
| Radium 226 | U | | <u>0.578</u> | 0.100 | U | GAM | U | | <u>0.756</u> | U | - | | 0.4 |
| Radium 228 | U | | <u>1.10</u> | 0.200 | U | GAM | U | | <u>1.25</u> | U | - | | 0.2 |
| Europium 152 | 514 | 1.4 | <u>0.990</u> | 0.100 | | GAM | 507 | 1.7 | <u>1.19</u> | | 1 | 15 | 0.3 |
| Europium 154 | 21.0 | 0.60 | <u>0.609</u> | 0.100 | | GAM | 21.1 | 0.75 | <u>0.748</u> | | 0 | 16 | 0.1 |
| Europium 155 | U | | <u>0.946</u> | 0.100 | U | GAM | U | | <u>1.08</u> | U | - | | 0.2 |
| Thorium 228 | U | | 0.427 | | U | GAM | U | | 0.489 | U | - | | 0.2 |
| Thorium 232 | U | | 1.10 | | U | GAM | U | | 1.25 | U | - | | 0.2 |
| Uranium 235 | U | | 1.67 | | U | GAM | U | | 1.91 | U | - | | 0.2 |
| Uranium-238 | U | | 30.6 | | U | GAM | U | | 34.4 | U | - | | 0.2 |
| Americium 241 | 2.88 | 0.45 | 0.704 | | | GAM | 4.78 | 0.60 | 0.861 | | <u>50</u> | <u>33</u> | <u>4.5</u> |
| Antimony 125 | U | | 0.637 | | U | GAM | U | | 0.726 | U | - | | 0.2 |
| Barium-133 | 19.4 | 0.23 | 0.270 | | | GAM | 18.8 | 0.34 | 0.396 | | 3 | 15 | 0.6 |
| Niobium 94 | U | | 0.335 | | U | GAM | U | | 0.388 | U | - | | 0.2 |

QC-DUP#1 78247

300 Area D4 Waste Characterization Sampling -
Other Solid

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

7842-008

J1HH93 (CONCRETE)

DUPLICATE

| | | |
|---|--|---|
| SDG <u>7842</u> Contact <u>N.Joseph Verville</u> Duplicates Lab sample id <u>S104086-08</u> Dept sample id <u>7842-008</u> % solids <u>100.0</u> | ORIGINAL Lab sample id <u>S104086-01</u> Dept sample id <u>7842-001</u> Received <u>04/19/11</u> % solids <u>100.0</u> | Client/Case no <u>Hanford</u> SDG <u>K3305</u> Contract No. <u>S00W235A00</u> Client sample id <u>J1HH93 (CONCRETE)</u> Location/Matrix <u>309-Bio Shield</u> <u>SOLID</u> Collected/Weight <u>04/12/11 15:00</u> <u>1241 g</u> Custody/SAF No <u>RC-040-609</u> <u>RC-040</u> |
|---|--|---|

| ANALYTE | DUPLICATE | 2σ ERR | MDA | RDL | QUALI- | ORIGINAL | 2σ ERR | MDA | QUALI- | RPD | 3σ | DER | |
|-----------------|-----------|---------|-------|-------|--------|----------|--------|---------|--------|-------|----|-----|---|
| | pCi/g | (COUNT) | pCi/g | pCi/g | FIERS | TEST | pCi/g | (COUNT) | pCi/g | FIERS | % | TOT | σ |
| Total Strontium | 0.155 | 0.34 | 0.670 | 1.00 | U | SR | 0.553 | 0.36 | 0.591 | U | - | 1.6 | |

QC-DUP#1 78366

300 Area D4 Waste Characterization Sampling -
Other Solid

Lab id EBRLNE
 Protocol RC-040
 Version Ver 1.0
 Form DVD-DUP
 Version 3.06
 Report date 05/13/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

7842-011

J1HH93 (CONCRETE)

DUPLICATE

| | | |
|----------------------------------|---------------------------------|--|
| SDG <u>7842</u> | Client/Case no <u>Hanford</u> | SDG <u>K3305</u> |
| Contact <u>N.Joseph Verville</u> | Contract No. <u>S00W235A00</u> | |
| DUPLICATE | ORIGINAL | |
| Lab sample id <u>S104086-11</u> | Lab sample id <u>S104086-01</u> | Client sample id <u>J1HH93 (CONCRETE)</u> |
| Dept sample id <u>7842-011</u> | Dept sample id <u>7842-001</u> | Location/Matrix <u>309-Bio Shield</u> <u>SOLID</u> |
| | Received <u>04/19/11</u> | Collected/Weight <u>04/12/11 15:00</u> <u>1241 g</u> |
| % solids <u>100.0</u> | % solids <u>100.0</u> | Custody/SAF No <u>RC-040-609</u> <u>RC-040</u> |

| ANALYTE | DUPLICATE | 2σ ERR | MDA | RDL | QUALI- | ORIGINAL | 2σ ERR | MDA | QUALI- | RPD | 3σ | DER | |
|-------------------|-----------|---------|-------------|-------|--------|----------|--------|-------|-------------|-------|-------|-----|-----|
| | pCi/g | (COUNT) | pCi/g | pCi/g | FIERS | | TEST | pCi/g | (COUNT) | pCi/g | FIERS | % | TOT |
| Nickel 63 | 6.92 | 4.3 | 6.92 | 30.0 | | NI_L | 9.03 | 5.2 | 8.22 | 26 | 129 | 0.6 | |
| Plutonium 238 | 0 | 0.27 | <u>1.04</u> | 1.00 | U | PU | -0.102 | 0.20 | 0.430 | U | - | 0.6 | |
| Plutonium 239/240 | 0.272 | 0.27 | <u>1.04</u> | 1.00 | U | PU | 0.374 | 0.17 | 0.163 | | 32 | 149 | 0.6 |
| Plutonium 241 | -7.32 | 19 | <u>31.5</u> | 15.0 | U | PU_L | -6.24 | 19 | <u>31.3</u> | U | - | 0.1 | |

QC-DUP#1 78383

300 Area D4 Waste Characterization Sampling -
Other Solid

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3305

7842-001

J1HH93 (CONCRETE)

DATA SHEET

| | | |
|-----------------------------------|---|------------------|
| SDG <u>7842</u> | Client/Case no <u>Hanford</u> | SDG <u>K3305</u> |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>S00W235A00</u> | |
| Lab sample id <u>S104086-01</u> | Client sample id <u>J1HH93 (CONCRETE)</u> | |
| Dept sample id <u>7842-001</u> | Location/Matrix <u>309-Bio Shield</u> | <u>SOLID</u> |
| Received <u>04/19/11</u> | Collected/Weight <u>04/12/11 15:00</u> | <u>1241 g</u> |
| % solids <u>100.0</u> | Custody/SAF No <u>RC-040-609</u> | <u>RC-040</u> |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI- FIERS | TEST |
|-------------------|------------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Tritium | 10028-17-8 | 1600 | 19 | 4.35 | 400 | | H |
| Carbon 14 | 14762-75-5 | 8.87 | 3.5 | 5.51 | 50.0 | | C |
| Nickel 63 | 13981-37-8 | 9.03 | 5.2 | 8.22 | 30.0 | | NI_L |
| Total Strontium | SR-RAD | 0.553 | 0.36 | 0.591 | 1.00 | U | SR |
| Americium 241 | 14596-10-2 | 0.919 | 0.79 | 1.00 | 1.00 | U | AM |
| Plutonium 238 | 13981-16-3 | -0.102 | 0.20 | 0.430 | 1.00 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.374 | 0.17 | 0.163 | 1.00 | | PU |
| Plutonium 241 | 14119-32-5 | -6.24 | 19 | <u>31.3</u> | 15.0 | U | PU_L |
| Potassium 40 | 13966-00-2 | U | | 2.08 | | U | GAM |
| Cobalt 60 | 10198-40-0 | 31.2 | 0.33 | <u>0.199</u> | 0.050 | | GAM |
| Cesium 137 | 10045-97-3 | 14.7 | 0.24 | <u>0.287</u> | 0.100 | | GAM |
| Radium 226 | 13982-63-3 | U | | <u>0.756</u> | 0.100 | U | GAM |
| Radium 228 | 15262-20-1 | U | | <u>1.25</u> | 0.200 | U | GAM |
| Europium 152 | 14683-23-9 | 507 | 1.7 | <u>1.19</u> | 0.100 | | GAM |
| Europium 154 | 15585-10-1 | 21.1 | 0.75 | <u>0.748</u> | 0.100 | | GAM |
| Europium 155 | 14391-16-3 | U | | <u>1.08</u> | 0.100 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 0.489 | | U | GAM |
| Thorium 232 | TH-232 | U | | 1.25 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 1.91 | | U | GAM |
| Uranium-238 | U-238 | U | | 34.4 | | U | GAM |
| Americium 241 | 14596-10-2 | 4.78 | 0.60 | 0.861 | | | GAM |
| Antimony 125 | 14234-35-6 | U | | 0.726 | | U | GAM |
| Barium-133 | 13981-41-4 | 18.8 | 0.34 | 0.396 | | | GAM |
| Niobium 94 | 14681-63-1 | U | | 0.388 | | U | GAM |

DATA SHEETS

Page 1

SUMMARY DATA SECTION

Page 17

| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>RC-040</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-DS</u> |
| Version <u>3.06</u> |
| Report date <u>05/13/11</u> |

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K3305

7842-001

J1HH93 (CONCRETE)

DATA SHEET, cont

| | | |
|-----------------------------------|---|------------------|
| SDG <u>7842</u> | Client/Case no <u>Hanford</u> | <u>SDG K3305</u> |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>S00W235A00</u> | |
| Lab sample id <u>S104086-01</u> | Client sample id <u>J1HH93 (CONCRETE)</u> | |
| Dept sample id <u>7842-001</u> | Location/Matrix <u>309-Bio Shield</u> | <u>SOLID</u> |
| Received <u>04/19/11</u> | Collected/Weight <u>04/12/11 15:00</u> | <u>1241 g</u> |
| % solids <u>100.0</u> | Custody/SAF No <u>RC-040-609</u> | <u>RC-040</u> |

300 Area D4 Waste Characterization Sampling -
Other Solid

DATA SHEETS

Page 2

SUMMARY DATA SECTION

Page 18

| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>RC-040</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-DS</u> |
| Version <u>3.06</u> |
| Report date <u>05/13/11</u> |

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K3305

7842-005

J1HH93-A (STEEL)

DATA SHEET

| | | |
|----------------------------------|--|------------------|
| SDG <u>7842</u> | Client/Case no <u>Hanford</u> | SDG <u>K3305</u> |
| Contact <u>N.Joseph Verville</u> | Contract No. <u>S00W235A00</u> | |
| Lab sample id <u>S104086-05</u> | Client sample id <u>J1HH93-A (STEEL)</u> | |
| Dept sample id <u>7842-005</u> | Location/Matrix <u>309-Bio Shield</u> | <u>SOLID</u> |
| Received <u>04/18/11</u> | Collected/Weight <u>04/12/11 15:00</u> | <u>1350 g</u> |
| % solids <u>100.0</u> | Custody/SAF No <u>RC-040-609</u> | <u>RC-040</u> |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI- FIERS | TEST |
|-------------------|------------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Tritium | 10028-17-8 | 29.1 | 44 | 72.7 | 400 | U | H |
| Carbon 14 | 14762-75-5 | 20.0 | 38 | <u>62.6</u> | 50.0 | U | C |
| Nickel 63 | 13981-37-8 | 42.4 | 38 | <u>61.7</u> | 30.0 | U | NI_L |
| Total Strontium | SR-RAD | -2.55 | 6.4 | <u>13.9</u> | 1.00 | U | SR |
| Americium 241 | 14596-10-2 | 3.75 | 4.5 | <u>7.19</u> | 1.00 | U | AM |
| Plutonium 238 | 13981-16-3 | -1.10 | 4.4 | <u>10.5</u> | 1.00 | U | PU |
| Plutonium 239/240 | PU-239/240 | 1.10 | 2.2 | <u>8.40</u> | 1.00 | U | PU |
| Plutonium 241 | 14119-32-5 | 42.8 | 180 | <u>293</u> | 15.0 | U | PU_L |
| Potassium 40 | 13966-00-2 | U | | 3.58 | | U | GAM |
| Cobalt 60 | 10198-40-0 | 143 | 1.3 | <u>0.394</u> | 0.050 | | GAM |
| Cesium 137 | 10045-97-3 | 3.52 | 0.44 | <u>0.521</u> | 0.100 | | GAM |
| Radium 226 | 13982-63-3 | U | | <u>0.708</u> | 0.100 | U | GAM |
| Radium 228 | 15262-20-1 | U | | <u>2.58</u> | 0.200 | U | GAM |
| Europium 152 | 14683-23-9 | 1.72 | 0.71 | <u>0.974</u> | 0.100 | | GAM |
| Europium 154 | 15585-10-1 | U | | <u>0.896</u> | 0.100 | U | GAM |
| Europium 155 | 14391-16-3 | U | | <u>0.513</u> | 0.100 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 0.465 | | U | GAM |
| Thorium 232 | TH-232 | U | | 2.58 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 1.37 | | U | GAM |
| Uranium-238 | U-238 | U | | 75.7 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 0.669 | | U | GAM |
| Antimony 125 | 14234-35-6 | U | | 0.852 | | U | GAM |
| Barium-133 | 13981-41-4 | U | | 0.376 | | U | GAM |
| Niobium 94 | 14681-63-1 | U | | 0.580 | | U | GAM |

| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>RC-040</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-DS</u> |
| Version <u>3.06</u> |
| Report date <u>05/13/11</u> |

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K3305

7842-005

J1HH93-A (STEEL)

DATA SHEET, cont

| | | |
|-----------------------------------|--|------------------|
| SDG <u>7842</u> | Client/Case no <u>Hanford</u> | SDG <u>K3305</u> |
| Contact <u>N. Joseph Verville</u> | Contract <u>No. S00W235A00</u> | |
| Lab sample id <u>S104086-05</u> | Client sample id <u>J1HH93-A (STEEL)</u> | |
| Dept sample id <u>7842-005</u> | Location/Matrix <u>309-Bio Shield</u> | <u>SOLID</u> |
| Received <u>04/18/11</u> | Collected/Weight <u>04/12/11 15:00</u> | <u>1350 g</u> |
| % solids <u>100.0</u> | Custody/SAF No <u>RC-040-609</u> | <u>RC-040</u> |

300 Area D4 Waste Characterization Sampling -
Other Solid

| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>RC-040</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-DS</u> |
| Version <u>3.06</u> |
| Report date <u>05/13/11</u> |

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

LAB METHOD SUMMARY

AMERICIUM 241 IN SOLIDS
ALPHA SPECTROSCOPY

Test AM Matrix SOLID
SDG 7842
Contact N. Joseph Verville

Client Hanford
Contract No. S00W235A00
Contract SDG K3305

RESULTS

| | | | | |
|------------------|-----------------|-----------------|-------------------------|------------------|
| LAB | RAW | SUF- | | Americium |
| SAMPLE ID | TEST FIX | PLANCHET | CLIENT SAMPLE ID | 241 |

Preparation batch 7287-098

| | | | |
|------------|----------|------------------------|--------|
| S104086-01 | 7842-001 | J1HH93 (CONCRETE) | U |
| S104086-02 | 7842-002 | Lab Control Sample | ok |
| S104086-03 | 7842-003 | Method Blank | U |
| S104086-04 | 7842-004 | Duplicate (S104086-01) | ok |
| S104086-05 | 7842-005 | J1HH93-A (STEEL) | 3.75 U |

Nominal values and limits from method RDLs (pCi/g) 1.00

METHOD PERFORMANCE

| | | | | | | | | | | | | | | | |
|------------------|-----------------|-------------------------|--------------|-------------|-------------|--------------|--------------|------------|--------------|-------------|--------------|-------------|-----------------|-------------|-----------------|
| LAB | RAW | SUF- | MDA | ALIQ | PREP | DILU- | YIELD | EFF | COUNT | FWHM | DRIFT | DAYS | ANAL- | | |
| SAMPLE ID | TEST FIX | CLIENT SAMPLE ID | pCi/g | g | FAC | TION | % | % | min | keV | KeV | HELD | PREPARED | YZED | DETECTOR |

Preparation batch 7287-098 2σ prep error 8.0 % Reference Lab Notebook No. 7287 pg.098

| | | | | | | | | | | | | | | |
|------------|------------------------|-------------|--------|--|--|--|----|-----|--|--|----|----------|-------|--------|
| S104086-01 | J1HH93 (CONCRETE) | 1.00 | 0.200 | | | | 43 | 105 | | | 14 | 04/25/11 | 04/26 | SS-008 |
| S104086-02 | Lab Control Sample | <u>6.69</u> | 0.0200 | | | | 70 | 103 | | | | 04/25/11 | 04/26 | SS-010 |
| S104086-03 | Method Blank | <u>9.44</u> | 0.0200 | | | | 61 | 103 | | | | 04/25/11 | 04/26 | SS-011 |
| S104086-04 | Duplicate (S104086-01) | 0.783 | 0.200 | | | | 70 | 104 | | | 14 | 04/25/11 | 04/26 | SS-014 |
| S104086-05 | J1HH93-A (STEEL) | <u>7.19</u> | 0.0250 | | | | 60 | 104 | | | 14 | 04/25/11 | 04/26 | SS-015 |

Nominal values and limits from method 1.00 0.0200 30-110 100 100 180

| | | |
|------------|-----------|--|
| PROCEDURES | REFERENCE | AMCMISO_IE_PLATE_AEA |
| | SPP-060 | Soil Preparation, rev 0 |
| | CP-965 | Americium & Curium in Water & Dissolved Samples by Extraction Chromatography & Microprecipitation, rev 3 |
| | CP-008 | Heavy Element Electroplating, rev 13 |

| | |
|-----------------|-------------------------------|
| AVERAGES ± 2 SD | MDA <u>5.02</u> ± <u>7.82</u> |
| FOR 5 SAMPLES | YIELD <u>61</u> ± <u>22</u> |

| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>RC-040</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-LMS</u> |
| Version <u>3.06</u> |
| Report date <u>05/13/11</u> |

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

Test PU Matrix SOLID
 SDG 7842
 Contact N. Joseph Verville

Client Hanford
 Contract No. S00W235A00
 Contract SDG K3305

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

RESULTS

| | | | | | |
|------------------|-----------------|-----------------|-------------------------|------------------|------------------|
| LAB | RAW | SUF- | | Plutonium | Plutonium |
| SAMPLE ID | TEST FIX | PLANCHET | CLIENT SAMPLE ID | 238 | 239/240 |

Preparation batch 7287-099

| | | | | | |
|------------|----|----------|------------------------|-----|--------|
| S104086-01 | A1 | 7842-001 | J1HH93 (CONCRETE) | U | 0.374 |
| S104086-05 | A1 | 7842-005 | J1HH93-A (STEEL) | U | 1.10 U |
| S104086-09 | | 7842-009 | Lab Control Sample | ok | ok |
| S104086-10 | | 7842-010 | Method Blank | U | U |
| S104086-11 | | 7842-011 | Duplicate (S104086-01) | - U | ok U |

| | | | |
|---------------------------------------|--------------|------|------|
| Nominal values and limits from method | RDLs (pCi/g) | 1.00 | 1.00 |
|---------------------------------------|--------------|------|------|

METHOD PERFORMANCE

| | | | | | | | | | | | | | | | | |
|------------------|-----------------|-------------------------|--|----------------|-------------|-------------|--------------|--------------|------------|--------------|-------------|--------------|-------------|-----------------|--------------|-----------------|
| LAB | RAW | SUF- | | MAX MDA | ALIQ | PREP | DILU- | YIELD | EFF | COUNT | FWHM | DRIFT | DAYS | | ANAL- | |
| SAMPLE ID | TEST FIX | CLIENT SAMPLE ID | | pCi/g | g | FAC | TION | % | % | min | keV | KeV | HELD | PREPARED | YZED | DETECTOR |

Preparation batch 7287-099 2σ prep error 8.0 % Reference Lab Notebook No. 7287 pg.099

| | | | | | | | | | | | | | | | |
|------------|----|------------------------|-------------|---------------|--|--|--|-----------|-----|--|--|----|----------|-------|--------|
| S104086-01 | A1 | J1HH93 (CONCRETE) | 0.430 | 0.250 | | | | 33 | 800 | | | 29 | 05/11/11 | 05/11 | SS-047 |
| S104086-05 | A1 | J1HH93-A (STEEL) | <u>10.5</u> | <u>0.0250</u> | | | | 41 | 107 | | | 29 | 05/11/11 | 05/11 | SS-048 |
| S104086-09 | | Lab Control Sample | <u>1.43</u> | 0.200 | | | | 35 | 103 | | | | 05/11/11 | 05/11 | SS-032 |
| S104086-10 | | Method Blank | <u>2.21</u> | 0.200 | | | | <u>23</u> | 103 | | | | 05/11/11 | 05/11 | SS-031 |
| S104086-11 | | Duplicate (S104086-01) | <u>1.04</u> | 0.250 | | | | 34 | 107 | | | 29 | 05/11/11 | 05/11 | SS-050 |

| | | | | | | |
|---------------------------------------|------|-------|--------|-----|-----|-----|
| Nominal values and limits from method | 1.00 | 0.200 | 30-110 | 100 | 100 | 180 |
|---------------------------------------|------|-------|--------|-----|-----|-----|

| | | |
|-------------------|---|------------------------|
| PROCEDURES | REFERENCE | PUISO_PLATE_AEA |
| SPP-070 | Soil Dissolution, < 1.0g Aliquot, rev 1 | |
| CP-941 | Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 12 | |
| CP-008 | Heavy Element Electroplating, rev 13 | |

| | |
|------------------------|--------------------------------------|
| AVERAGES ± 2 SD | MDA <u>3.12</u> ± <u>8.35</u> |
| FOR 5 SAMPLES | YIELD <u>33</u> ± <u>13</u> |

METHOD SUMMARIES

Page 2

SUMMARY DATA SECTION

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| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>RC-040</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-LMS</u> |
| Version <u>3.06</u> |
| Report date <u>05/13/11</u> |

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

Test SR Matrix SOLID
 SDG 7842
 Contact N.Joseph Verville

Client Hanford
 Contract No. S00W235A00
 Contract SDG K3305

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS
 BETA COUNTING

RESULTS

| LAB | RAW | SUF- | | Total |
|---------------------------------------|----------|----------|------------------------|-----------|
| SAMPLE ID | TEST FIX | PLANCHET | CLIENT SAMPLE ID | Strontium |
| Preparation batch 7287-099 | | | | |
| S104086-01 | | 7842-001 | J1HH93 (CONCRETE) | U |
| S104086-05 | | 7842-005 | J1HH93-A (STEEL) | U |
| S104086-06 | | 7842-006 | Lab Control Sample | ok |
| S104086-07 | | 7842-007 | Method Blank | U |
| S104086-08 | | 7842-008 | Duplicate (S104086-01) | - U |
| Nominal values and limits from method | | | RDLs (pCi/g) | 1.00 |

METHOD PERFORMANCE

| LAB | RAW | SUF- | MDA | ALIQ | PREP | DILU- | YIELD | EPF | COUNT | FWHM | DRIFT | DAYS | ANAL- | | |
|---------------------------------------|----------|------------------------|---|---------------|------|-------|--------|-----|-------|------|-------|------|----------|-------|----------|
| SAMPLE ID | TEST FIX | CLIENT SAMPLE ID | pCi/g | g | FAC | TION | % | % | min | keV | KeV | HELD | PREPARED | YZED | DETECTOR |
| Preparation batch 7287-099 | | | 2σ prep error 10.4 % Reference Lab Notebook No. 7287 pg.099 | | | | | | | | | | | | |
| S104086-01 | | J1HH93 (CONCRETE) | 0.591 | 0.500 | | | 81 | | 120 | | | 22 | 05/04/11 | 05/04 | GRB-231 |
| S104086-05 | | J1HH93-A (STEEL) | <u>13.9</u> | <u>0.0250</u> | | | 79 | | 100 | | | 22 | 05/04/11 | 05/04 | GRB-222 |
| S104086-06 | | Lab Control Sample | 0.495 | 0.500 | | | 90 | | 120 | | | | 05/04/11 | 05/04 | GRB-232 |
| S104086-07 | | Method Blank | 0.754 | 0.500 | | | 87 | | 100 | | | | 05/04/11 | 05/04 | GRB-224 |
| S104086-08 | | Duplicate (S104086-01) | 0.670 | 0.500 | | | 86 | | 100 | | | 22 | 05/04/11 | 05/04 | GRB-230 |
| Nominal values and limits from method | | | 1.00 | 0.500 | | | 40-110 | | 100 | | | | | | 180 |

PROCEDURES REFERENCE SRTOT_SEP_PRECIP_GPC
 SPP-070 Soil Dissolution, < 1.0g Aliquot, rev 1
 CP-383 Strontium in Dissolved Solid of < 5.0g Aliquot, rev 4

AVERAGES ± 2 SD MDA 3.28 ± 11.9
 FOR 5 SAMPLES YIELD 85 ± 9

Lab id EBRLNE
 Protocol RC-040
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 05/13/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

Test GAM Matrix SOLID
 SDG 7842
 Contact N.Joseph Verville

LAB METHOD SUMMARY

GAMMA SCAN
 GAMMA SPECTROSCOPY

Client Hanford
 Contract No. S00W235A00
 Contract SDG K3305

RESULTS

LAB RAW SUF-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Cobalt 60 Cesium 137

Preparation batch 7287-098

| SAMPLE ID | TEST FIX | PLANCHET | CLIENT SAMPLE ID | Cobalt 60 | Cesium 137 |
|------------|----------|----------|------------------------|-----------|------------|
| S104086-01 | | 7842-001 | J1HH93 (CONCRETE) | 31.2 | 14.7 |
| S104086-02 | | 7842-002 | Lab Control Sample | ok | ok |
| S104086-03 | | 7842-003 | Method Blank | U | U |
| S104086-04 | | 7842-004 | Duplicate (S104086-01) | ok | ok |
| S104086-05 | | 7842-005 | J1HH93-A (STEEL) | 143 | 3.52 |

Nominal values and limits from method RDLs (pCi/g) 0.050 0.100

METHOD PERFORMANCE

LAB RAW SUF- MDA ALIQ PREP DILU- YIELD EFF COUNT FWHM DRIFT DAYS ANAL-
 SAMPLE ID TEST FIX CLIENT SAMPLE ID pCi/g g FAC TION % % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 7287-098 2σ prep error 7.0 % Reference Lab Notebook No. 7287 pg.098

| SAMPLE ID | TEST FIX | CLIENT SAMPLE ID | MDA pCi/g | ALIQ g | PREP FAC | DILU- TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL- YZED | DETECTOR |
|------------|----------|------------------------|--------------|--------|----------|------------|---------|-------|-----------|----------|-----------|-----------|----------|------------|----------|
| S104086-01 | | J1HH93 (CONCRETE) | <u>1.63</u> | 173 | | | | | 400 | | 9 | 04/21/11 | 04/21 | JR,02,00 | |
| S104086-02 | | Lab Control Sample | <u>0.197</u> | 30.0 | | | | | 405 | | | 04/21/11 | 04/21 | JR,04,00 | |
| S104086-03 | | Method Blank | <u>9.73</u> | 30.0 | | | | | 406 | | | 04/21/11 | 04/21 | JR,03,00 | |
| S104086-04 | | Duplicate (S104086-01) | <u>1.40</u> | 173 | | | | | 531 | | 9 | 04/21/11 | 04/21 | JR,02,00 | |
| S104086-05 | | J1HH93-A (STEEL) | <u>1.29</u> | 33.9 | | | | | 602 | | 9 | 04/21/11 | 04/21 | JR,01,00 | |

Nominal values and limits from method 0.050 30.0 100 180

PROCEDURES REFERENCE GAMMA_GS
 SPP-100 Preparation of Sample for Gamma Spectroscopy,
 rev 0

AVERAGES ± 2 SD MDA 2.85 ± 7.77
 FOR 5 SAMPLES YIELD _____ ± _____

Lab id EBRLNE
 Protocol RC-040
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 05/13/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

LAB METHOD SUMMARY

CARBON 14 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Test C Matrix SOLID
 SDG 7842
 Contact N. Joseph Verville

Client Hanford
 Contract No. S00W235A00
 Contract SDG K3305

RESULTS

LAB RAW SUP-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Carbon 14

Preparation batch 7287-098

| | | | |
|------------|----------|------------------------|------|
| S104086-01 | 7842-001 | J1HH93 (CONCRETE) | 8.87 |
| S104086-02 | 7842-002 | Lab Control Sample | ok |
| S104086-03 | 7842-003 | Method Blank | U |
| S104086-04 | 7842-004 | Duplicate (S104086-01) | ok U |
| S104086-05 | 7842-005 | J1HH93-A (STEEL) | U |

Nominal values and limits from method RDLs (pCi/g) 50.0

METHOD PERFORMANCE

LAB RAW SUP- MDA ALIQ PREP DILU- YIELD EFF COUNT FWHM DRIFT DAYS ANAL-
 SAMPLE ID TEST FIX CLIENT SAMPLE ID pCi/g g FAC TION % % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 7287-098 2σ prep error 10.0 % Reference Lab Notebook No. 7287 pg.098

| | | | | | | | | | |
|------------|------------------------|-------------|--------|-----|----|----|----------|-------|---------|
| S104086-01 | J1HH93 (CONCRETE) | 5.51 | 0.256 | 100 | 50 | 10 | 04/22/11 | 04/22 | LSC-006 |
| S104086-02 | Lab Control Sample | <u>146</u> | 0.0200 | 100 | 10 | | 04/22/11 | 04/22 | LSC-006 |
| S104086-03 | Method Blank | <u>72.2</u> | 0.0200 | 100 | 50 | | 04/22/11 | 04/22 | LSC-006 |
| S104086-04 | Duplicate (S104086-01) | 5.45 | 0.252 | 100 | 50 | 10 | 04/22/11 | 04/22 | LSC-006 |
| S104086-05 | J1HH93-A (STEEL) | <u>62.6</u> | 0.0227 | 100 | 50 | 10 | 04/22/11 | 04/22 | LSC-006 |

Nominal values and limits from method 50.0 0.0200 10 180

PROCEDURES REFERENCE C14_COX_LSC
 CP-251 Tritium/Carbon-14 Oxidation, rev 11

AVERAGES ± 2 SD MDA 58.4 ± 116
 FOR 5 SAMPLES YIELD 100 ± 0

Lab id EBRLNE
 Protocol RC-040
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 05/13/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

Test H Matrix SOLID
 SDG 7842
 Contact N.Joseph Verville

LAB METHOD SUMMARY

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
 Contract No. S00W235A00
 Contract SDG K3305

RESULTS

LAB RAW SUF-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Tritium

Preparation batch 7287-098

| | | | |
|------------|----------|------------------------|------|
| S104086-01 | 7842-001 | J1HH93 (CONCRETE) | 1600 |
| S104086-02 | 7842-002 | Lab Control Sample | ok |
| S104086-03 | 7842-003 | Method Blank | U |
| S104086-04 | 7842-004 | Duplicate (S104086-01) | ok |
| S104086-05 | 7842-005 | J1HH93-A (STEEL) | U |

Nominal values and limits from method RDLs (pCi/g) 400

METHOD PERFORMANCE

LAB RAW SUF- MDA ALIQ PREP DILU- YIELD EPF COUNT FWHM DRIFT DAYS ANAL-
 SAMPLE ID TEST FIX CLIENT SAMPLE ID pCi/g g FAC TION % % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 7287-098 2σ prep error 10.0 % Reference Lab Notebook No. 7287 pg.098

| | | | | | | | | | |
|------------|------------------------|------|--------|-----|-----|----|----------|-------|---------|
| S104086-01 | J1HH93 (CONCRETE) | 4.35 | 0.256 | 100 | 100 | 12 | 04/22/11 | 04/24 | LSC-005 |
| S104086-02 | Lab Control Sample | 95.6 | 0.0200 | 100 | 50 | | 04/22/11 | 04/25 | LSC-005 |
| S104086-03 | Method Blank | 79.4 | 0.0200 | 100 | 50 | | 04/22/11 | 04/24 | LSC-005 |
| S104086-04 | Duplicate (S104086-01) | 4.43 | 0.252 | 100 | 100 | 12 | 04/22/11 | 04/24 | LSC-005 |
| S104086-05 | J1HH93-A (STEEL) | 72.7 | 0.0227 | 100 | 50 | 12 | 04/22/11 | 04/24 | LSC-005 |

Nominal values and limits from method 400 0.0200 25 180

PROCEDURES REFERENCE TRITIUM_COX_LSC
 CP-251 Tritium/Carbon-14 Oxidation, rev 11

AVERAGES ± 2 SD MDA 51.3 ± 87.2
 FOR 5 SAMPLES YIELD 100 ± 0

METHOD SUMMARIES

Page 6

SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol RC-040
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 05/13/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

LAB METHOD SUMMARY

NICKEL 63 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID
 SDG 7842
 Contact N. Joseph Verville

Client Hanford
 Contract No. S00W235A00
 Contract SDG K3305

RESULTS

LAB RAW SUP-
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Nickel 63

Preparation batch 7287-099

| | | | | |
|------------|----|----------|------------------------|--------|
| S104086-01 | A1 | 7842-001 | J1HH93 (CONCRETE) | 9.03 |
| S104086-05 | A1 | 7842-005 | J1HH93-A (STEEL) | 42.4 U |
| S104086-09 | | 7842-009 | Lab Control Sample | ok |
| S104086-10 | | 7842-010 | Method Blank | U |
| S104086-11 | | 7842-011 | Duplicate (S104086-01) | ok |

Nominal values and limits from method RDLs (pCi/g) 30.0

METHOD PERFORMANCE

LAB RAW SUP- MDA ALIQ PREP DILU- YIELD EFF COUNT FWHM DRIFT DAYS ANAL-
 SAMPLE ID TEST FIX CLIENT SAMPLE ID pCi/g g FAC TION % % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 7287-099 2σ prep error 11.2 % Reference Lab Notebook No. 7287 pg.099

| | | | | | | | | | | | | | |
|------------|----|------------------------|-------------|---------------|--|--|-----|----|--|----|----------|-------|---------|
| S104086-01 | A1 | J1HH93 (CONCRETE) | 8.22 | 0.250 | | | 73 | 50 | | 28 | 05/10/11 | 05/10 | LSC-004 |
| S104086-05 | A1 | J1HH93-A (STEEL) | <u>61.7</u> | <u>0.0250</u> | | | 96 | 50 | | 28 | 05/10/11 | 05/10 | LSC-004 |
| S104086-09 | | Lab Control Sample | 7.48 | 0.200 | | | 100 | 50 | | | 05/10/11 | 05/10 | LSC-004 |
| S104086-10 | | Method Blank | 7.42 | 0.200 | | | 98 | 50 | | | 05/10/11 | 05/10 | LSC-004 |
| S104086-11 | | Duplicate (S104086-01) | 6.92 | 0.250 | | | 85 | 50 | | 28 | 05/10/11 | 05/10 | LSC-004 |

Nominal values and limits from method 30.0 0.200 40-110 25 180

PROCEDURES REFERENCE NI63_LSC
 SPP-070 Soil Dissolution, < 1.0g Aliquot, rev 1
 CP-281 Nickel-63 Purification By Extraction
 Chromatography, rev 5

AVERAGES ± 2 SD MDA 18.3 ± 48.5
 FOR 5 SAMPLES YIELD 90 ± 23

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol RC-040
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 05/13/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3305

LAB METHOD SUMMARY

PLUTONIUM 241 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Test PU L Matrix SOLID

SDG 7842

Contact N. Joseph Verville

Client Hanford

Contract No. S00W235A00

Contract SDG K3305

RESULTS

| | | | | | |
|------------------|-----------------|-----------------|-------------------------|--|------------------|
| LAB | RAW | SUF- | | | Plutonium |
| SAMPLE ID | TEST FIX | PLANCHET | CLIENT SAMPLE ID | | 241 |

Preparation batch 7287-099

| | | | | |
|------------|----|----------|------------------------|--------|
| S104086-01 | A1 | 7842-001 | J1HH93 (CONCRETE) | U |
| S104086-05 | A1 | 7842-005 | J1HH93-A (STEEL) | 42.8 U |
| S104086-09 | | 7842-009 | Lab Control Sample | ok |
| S104086-10 | | 7842-010 | Method Blank | U |
| S104086-11 | | 7842-011 | Duplicate (S104086-01) | - U |

Nominal values and limits from method RDLs (pCi/g) 15.0

METHOD PERFORMANCE

| | | | | | | | | | | | | | | | | |
|------------------|-----------------|-------------------------|--|--------------|-------------|-------------|--------------|--------------|------------|--------------|-------------|--------------|-------------|-----------------|--------------|-----------------|
| LAB | RAW | SUF- | | MDA | ALIQ | PREP | DILU- | YIELD | EFF | COUNT | FWHM | DRIFT | DAYS | | ANAL- | |
| SAMPLE ID | TEST FIX | CLIENT SAMPLE ID | | pCi/g | g | FAC | TION | % | % | min | keV | KeV | HELD | PREPARED | YZED | DETECTOR |

Preparation batch 7287-099 2σ prep error 12.4 % Reference Lab Notebook No. 7287 pg.099

| | | | | | | | | | | | | | | | | |
|------------|----|------------------------|-------------|---------------|--|--|--|----|--|-----|--|--|----|----------|-------|---------|
| S104086-01 | A1 | J1HH93 (CONCRETE) | <u>31.3</u> | 0.250 | | | | 37 | | 100 | | | 29 | 05/11/11 | 05/11 | LSC-006 |
| S104086-05 | A1 | J1HH93-A (STEEL) | <u>293</u> | <u>0.0250</u> | | | | 39 | | 100 | | | 29 | 05/11/11 | 05/11 | LSC-006 |
| S104086-09 | | Lab Control Sample | <u>35.6</u> | 0.200 | | | | 40 | | 100 | | | | 05/11/11 | 05/11 | LSC-006 |
| S104086-10 | | Method Blank | <u>40.2</u> | 0.200 | | | | 36 | | 100 | | | | 05/11/11 | 05/11 | LSC-006 |
| S104086-11 | | Duplicate (S104086-01) | <u>31.5</u> | 0.250 | | | | 37 | | 100 | | | 29 | 05/11/11 | 05/11 | LSC-006 |

Nominal values and limits from method 15.0 0.200 30-110 50 180

| | | |
|-------------------|------------------|---|
| PROCEDURES | REFERENCE | PU241_IE_LSC |
| | SPP-070 | Soil Dissolution, < 1.0g Aliquot, rev 1 |
| | CP-941 | Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 12 |
| | RP-948 | Plutonium-241 by Liquid Scintillation Counting, rev 4 |

| | |
|------------------------|-------------------------------------|
| AVERAGES ± 2 SD | MDA <u>86.3</u> ± <u>231</u> |
| FOR 5 SAMPLES | YIELD <u>38</u> ± <u>3</u> |

METHOD SUMMARIES

Page 8

SUMMARY DATA SECTION

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Lab id EBRLNE

Protocol RC-040

Version Ver 1.0

Form DVD-LMS

Version 3.06

Report date 05/13/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3305

SDG 7842
Contact N.Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K3305

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol RC-040
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/13/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3305

SDG 7842
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K3305

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

- U The RESULT is less than the MDA (Minimum Detectable Activity).

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
 - B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
 - H Similar to 'L' except the recovery was high.
 - P The RESULT is 'preliminary'.
 - X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
 - 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- * An MDA is underlined if it is bigger than its RDL.

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- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- * The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:

1. A fixed percentage specified in the protocol.

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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

- * The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

- * The first, computed limits for the recovery reflect:

1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

2. The error of ADDED.

3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

- * The second limits are protocol defined upper and lower QC limits

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

- * The recovery is underlined (out of spec) if it is outside either of these ranges.

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- * Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- * If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
 - * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.
- MDAs are underlined if greater than the printed RDL.
- * Aliquots are underlined if less than the nominal value specified for the method.
 - * Preparation factors are underlined if greater than the nominal value specified for the method.
 - * Dilution factors are underlined if greater than the nominal value specified for the method.
 - * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
 - * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
 - * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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METHOD SUMMARY

- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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| Washington Closure Hanford | | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | | | | | RC-040-609 | Page 1 of 1 |
|--|-------------|--|-------------|--|---|---|------------------------------------|---|---------------|----------------------------|
| Collector Hulse | | Company Contact Mike Stankovich | | | Telephone No. 509.430.7142 | | Project Coordinator KESSNER, JH | | Price Code 9K | Data Turnaround 15 Days |
| Project Designation 300 Area D4 Waste Characterization Sampling - Other Solid | | Sampling Location 309-Bio Shield | | | K3 305 (B42) | | SAF No. RC-040 | | | |
| Ice Chest No. WCH-11-004 | | Field Logbook No. EL-1518-19 | | COA RD4MXX2F00 | | Method of Shipment FedEx | | | | |
| Shipped To EBERLINE SERVICES / LIONVILLE | | Offsite Property No. See RSR | | | Bill of Lading/Air Bill No. See OSPC | | | | | |
| POSSIBLE SAMPLE HAZARDS/REMARKS Rad | | | | Preservation | None | None | None | None | None | |
| Special Handling and/or Storage | | | | Type of Container | G/P | G/P | G/P | aG | G/P | |
| | | | | No. of Container(s) | 1 | 0 | 0 | 0 | 1 | |
| | | | | Volume | 500mL | 60mL | 60mL | 60mL | 60mL | |
| SAMPLE ANALYSIS | | | | See item (1) in Special Instructions | Isotopic Plutonium | Americium-241/Curium-244 (Americium-241, Curium-244) wa 4/13/11 | Tritium - H3; Carbon-14 | RCI GEA Shipping Screen RES | | |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | |
| J1HH93 | OTHER SOLID | 4/12/11 | 1500 | X | X | X | X | X | RCF | 27687 2584g |
| CHAIN OF POSSESSION | | | | Sign/Print Names | | | | SPECIAL INSTRUCTIONS | | |
| Relinquished By/Removed From DAW BENEVOLENT | | Date/Time 9-13-11/14:41 | | Received By/Stored In Mike Stankovich | | Date/Time 4/13/11 1441 | | (1) Gamma Spec (Client List) {Americium-241, Antimony-125, Barium-133, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Radium-228} | | |
| Relinquished By/Removed From WCH | | Date/Time 4/13/11 1450 | | Received By/Stored In KB Hulse | | Date/Time 4/13/11 1450 | | | | |
| Relinquished By/Removed From KB Hulse | | Date/Time 4/13/11 1510 | | Received By/Stored In RCF | | Date/Time 4-13-11 1510 | | | | |
| Relinquished By/Removed From RCF | | Date/Time 4-18-11 0845 | | Received By/Stored In KB Hulse | | Date/Time 4-18-11 0845 | | | | |
| Relinquished By/Removed From KB Hulse | | Date/Time 4-18-11 1400 | | Received By/Stored In FEDEX | | Date/Time | | | | |
| Relinquished By/Removed From FEDEX | | Date/Time | | Received By/Stored In Alex Kelen | | Date/Time 4/19/11 09:30 | | Matrix * | | |
| LABORATORY SECTION | | Received By | | Title | | | | Date/Time | | |
| FINAL SAMPLE DISPOSITION | | Disposal Method | | Disposed By | | | | Date/Time | | |



RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: W.C. HAUFERD City RICHMOND State WA

Date/Time received 4/19/11 09:30 CoC No. RC-040-609

Container I.D. No. 404-11-004 Requested TAT (Days) 15 P.O. Received Yes [] No []

INSPECTION

1. Custody seals on shipping container intact? Yes [] No [] N/A []
2. Custody seals on shipping container dated & signed? Yes [] No [] N/A []
3. Custody seals on sample containers intact? Yes [] No [] N/A []
4. Custody seals on sample containers dated & signed? Yes [] No [] N/A []
5. Packing material is: Wet [] Dry [] N/A
6. Number of samples in shipping container: 1 Sample Matrix OTHER SOLID
7. Number of containers per sample: 1 (Or see CoC _____)
8. Samples are in correct container Yes [] No []
9. Paperwork agrees with samples? Yes [] No []
10. Samples have: Tape [] Hazard labels [] Rad labels [] Appropriate sample labels []
11. Samples are: In good condition [] Leaking [] Broken Container [] Missing []
12. Samples are: Preserved [] Not preserved [] pH _____ Preservative _____
13. Describe any anomalies:

14. Was P.M. notified of any anomalies? Yes [] No [] Date _____
15. Inspected by Jrk Date: 4/19/11 Time: 09:40

| Customer Sample No. | Beta/Gamma cpm | Ion Chamber mR/hr | Wipe | Customer Sample No. | Beta/Gamma cpm | Ion Chamber mR/hr | wipe |
|---------------------|----------------|-------------------|------|---------------------|----------------|-------------------|------|
| <u>J1H493</u> | <u>9000</u> | | | | | | |
| | | | | | | | |
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| | | | | | | | |

Ion Chamber Ser. No. _____ Calibration date _____
 Alpha Meter Ser. No. _____ Calibration date _____
 Beta/Gamma Meter Ser. No. 100482 Calibration date 24 Sep. 2010