

RECEIVED FEBRUARY 12, 2010



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February 12, 2010

Mr. Michael Neely  
CH2M Hill Plateau Remediation Company  
P.O. Box 1600  
Mail Stop – B6-06  
Richland, WA 99352

Reference: **P.O. #33677**  
**Eberline Analytical S0-02-031-7763, SDG H4153**

Dear Mr. Neely:

Enclosed is a data report for one other liquid sample designated under SAF No. F10-021 received at Eberline Analytical on February 5, 2010. The sample was analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,



N. Joseph Verville  
Client Services Manager

*NJV/jag*

*Enclosure: Case Narrative*

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JUL 21 2010  
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## 1.0 GENERAL

CH2M Hill Plateau Remediation Company (CHPRC) Sample Delivery Group H4153 was composed of one other liquid sample designated under SAF No. F10-021 with a Project Designation of: ARRA Upper & Lower ALE Building Science Laboratory – Other Liquids.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist.

## 2.0 ANALYSIS NOTES

### 2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

### 2.2 Tritium Analysis

The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. No problems were encountered during the course of the analyses.

### 2.3 Nickel-63 Analysis

The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. No problems were encountered during the course of the analyses.

### 2.4 Strontium-90 Analysis

The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. No problems were encountered during the course of the analyses.

### 2.5 Technetium-99 Analysis

The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. No problems were encountered during the course of the analyses.

### 2.6 Isotopic Thorium Analysis

The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. No problems were encountered during the course of the analyses.

### 2.7 Isotopic Uranium Analysis

The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. No problems were encountered during the course of the analyses.

**2.8 Isotopic Plutonium Analysis**

No problems were encountered during the course of the analyses. No other problems were encountered during the course of the analyses.

**2.9 Plutonium-241 Analysis**

Due to the expedited TAT requested for the SDG 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 other problems were encountered during the course of the analyses.

**2.10 Americium-241 and Curium-243/244 Analysis**

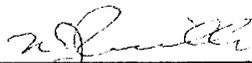
The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. No problems were encountered during the course of the analyses.

**2.11 Gamma Spectroscopy**

No 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**  
Senior Program Manager

2/12/10

\_\_\_\_\_  
**Date**

EBERLINE ANALYTICAL / RICHMOND  
SAMPLE DELIVERY GROUP H4153

SDG 7763  
Contact N. Joseph Verville

Client CHPRC  
Contract No. 33677  
Case no SDG H4153

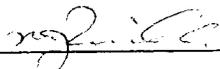
S U M M A R Y   D A T A   S E C T I O N

| T A B L E   O F   C O N T E N T S |   |   |   |    |
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Prepared by



Reviewed by



Lab id EBRLNE  
Protocol CHPRC  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4153

SDG 7763  
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC  
 Contract No. 33677  
 Case no SDG\_H4153

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

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SUMMARY DATA SECTION

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Lab id EBRLNE  
 Protocol CHPRC  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/12/10

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4153

SDG 7763  
Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC  
Contract No. 33677  
Case no SDG\_H4153

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE  
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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

LAB SAMPLE SUMMARY

SDG 7763  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Case no SDG H4153

| LAB SAMPLE ID | CLIENT SAMPLE ID       | LOCATION                | MATRIX | LEVEL | SAF NO  | CHAIN OF CUSTODY | COLLECTED      |
|---------------|------------------------|-------------------------|--------|-------|---------|------------------|----------------|
| S002031-01    | B23K14                 | Uppr&LowrAleBld;Kitchen | LIQUID |       | F10-021 | F10-021-025      | 02/04/10 10:57 |
| S002031-02    | Lab Control Sample     |                         | LIQUID |       | F10-021 |                  |                |
| S002031-03    | Method Blank           |                         | LIQUID |       | F10-021 |                  |                |
| S002031-04    | Duplicate (S002031-01) | Uppr&LowrAleBld;Kitchen | LIQUID |       | F10-021 |                  | 02/04/10 10:57 |
| S002031-05    | Lab Control Sample     |                         | LIQUID |       | F10-021 |                  |                |
| S002031-06    | Method Blank           |                         | LIQUID |       | F10-021 |                  |                |
| S002031-07    | Duplicate (S002031-01) | Uppr&LowrAleBld;Kitchen | LIQUID |       | F10-021 |                  | 02/04/10 10:57 |

LAB SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE  
 Protocol CHPRC  
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 Form DVD-LS  
 Version 3.06  
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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

SDG 7763  
 Contact N. Joseph Verville

QC SUMMARY

Client CHPRC  
 Contract No. 33677  
 Case no SDG H4153

| QC BATCH | CHAIN OF CUSTODY | CLIENT SAMPLE ID       | MATRIX | % SOLIDS | SAMPLE AMOUNT | BASIS AMOUNT | DAYS SINCE RECEIVED | LAB COLL SAMPLE ID | DEPARTMENT SAMPLE ID |
|----------|------------------|------------------------|--------|----------|---------------|--------------|---------------------|--------------------|----------------------|
| 7763     | F10-021-025      | B23K14                 | LIQUID |          | 620 mL        |              | 02/05/10 1          | S002031-01         | 7763-001             |
|          |                  | Method Blank           | LIQUID |          |               |              |                     | S002031-03         | 7763-003             |
|          |                  | Method Blank           | LIQUID |          |               |              |                     | S002031-06         | 7763-006             |
|          |                  | Lab Control Sample     | LIQUID |          |               |              |                     | S002031-02         | 7763-002             |
|          |                  | Lab Control Sample     | LIQUID |          |               |              |                     | S002031-05         | 7763-005             |
|          |                  | Duplicate (S002031-01) | LIQUID |          | 620 mL        |              | 02/05/10 1          | S002031-04         | 7763-004             |
|          |                  | Duplicate (S002031-01) | LIQUID |          | 620 mL        |              | 02/05/10 1          | S002031-07         | 7763-007             |

QC SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLINE  
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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

SDG 7763  
 Contact N. Joseph Verville

PREP BATCH SUMMARY

Client CHPRC  
 Contract No. 33677  
 Case no SDG H4153

| TEST                          | MATRIX | METHOD                         | PREPARATION ERROR |      | PLANCHETS ANALYZED |      |    |       | QUALI- |
|-------------------------------|--------|--------------------------------|-------------------|------|--------------------|------|----|-------|--------|
|                               |        |                                | BATCH             | 2σ % | CLIENT             | MORE | RE | BLANK |        |
| Alpha Spectroscopy            |        |                                |                   |      |                    |      |    |       |        |
| PU                            | LIQUID | Plutonium-238,239/240, Liquid  | 7243-084          | 8.0  | 1                  |      | 1  | 1     | 1/1    |
| TH                            | LIQUID | Thorium, Isotopic in Liquid    | 7243-084          | 8.0  | 1                  |      | 1  | 1     | 1/1    |
| TP                            | LIQUID | Americium 241/Curium in Liquid | 7243-084          | 8.0  | 1                  |      | 1  | 1     | 1/1    |
| U                             | LIQUID | Uranium in Liquid              | 7243-084          | 8.0  | 1                  |      | 1  | 1     | 1/1    |
| Beta Counting                 |        |                                |                   |      |                    |      |    |       |        |
| SR                            | LIQUID | Total Strontium in Liquids     | 7243-084          | 10.4 | 1                  |      | 1  | 1     | 1/1    |
| TC                            | LIQUID | Technetium-99 in Liquid        | 7243-084          | 13.2 | 1                  |      | 1  | 1     | 1/1    |
| Gas Proportional Counting     |        |                                |                   |      |                    |      |    |       |        |
| 93A                           | LIQUID | Gross Alpha in Liquid          | 7243-084          | 20.6 | 1                  |      | 1  | 1     | 1/1    |
| 93B                           | LIQUID | Gross Beta in Liquid           | 7243-084          | 11.0 | 1                  |      | 1  | 1     | 1/1    |
| Gamma Spectroscopy            |        |                                |                   |      |                    |      |    |       |        |
| GAM                           | LIQUID | Gamma Scan in Liquid           | 7243-084          | 7.0  | 1                  |      | 1  | 1     | 1/1    |
| Liquid Scintillation Counting |        |                                |                   |      |                    |      |    |       |        |
| H                             | LIQUID | Tritium in Liquid              | 7243-084          | 10.0 | 1                  |      | 1  | 1     | 1/1    |
| NI_L                          | LIQUID | Nickel-63 in Liquid            | 7243-084          | 11.2 | 1                  |      | 1  | 1     | 1/1    |
| PU_L                          | LIQUID | Plutonium 241 in Liquids       | 7243-084          | 12.4 | 1                  |      | 1  | 1     | 1/1    |

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.  
 Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRINE  
 Protocol CHPRC  
 Version Ver 1.0  
 Form DVD-PBS  
 Version 3.06  
 Report date 02/12/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

SDG 7763  
 Contact N. Joseph Verville

LAB WORK SUMMARY

Client CHPRC  
 Contract No. 33677  
 Case no SDG H4153

| LAB SAMPLE | CLIENT SAMPLE ID        |         |          |        |     |          |          |     |                                |  |  |
|------------|-------------------------|---------|----------|--------|-----|----------|----------|-----|--------------------------------|--|--|
| COLLECTED  | LOCATION                | MATRIX  | SUP-     |        |     |          |          |     |                                |  |  |
| RECEIVED   | CUSTODY                 | SAF No  | PLANCHET | TEST   | FIX | ANALYZED | REVIEWED | BY  | METHOD                         |  |  |
| S002031-01 | B23K14                  |         | 7763-001 | 93A/93 |     | 02/09/10 | 02/09/10 | BW  | Gross Alpha in Liquid          |  |  |
| 02/04/10   | Uppr&LowrAleBld;Kitchen | LIQUID  | 7763-001 | 93B/93 |     | 02/09/10 | 02/09/10 | BW  | Gross Beta in Liquid           |  |  |
| 02/05/10   | F10-021-025             | F10-021 | 7763-001 | GAM    |     | 02/08/10 | 02/11/10 | CSS | Gamma Scan in Liquid           |  |  |
|            |                         |         | 7763-001 | H      |     | 02/08/10 | 02/10/10 | BW  | Tritium in Liquid              |  |  |
|            |                         |         | 7763-001 | NI_L   |     | 02/09/10 | 02/12/10 | BW  | Nickel-63 in Liquid            |  |  |
|            |                         |         | 7763-001 | PU     |     | 02/11/10 | 02/11/10 | BW  | Plutonium-238,239/240, Liquid  |  |  |
|            |                         |         | 7763-001 | PU_L   |     | 02/10/10 | 02/11/10 | BW  | Plutonium 241 in Liquids       |  |  |
|            |                         |         | 7763-001 | SR     |     | 02/10/10 | 02/12/10 | BW  | Total Strontium in Liquids     |  |  |
|            |                         |         | 7763-001 | TC     |     | 02/10/10 | 02/11/10 | BW  | Technetium-99 in Liquid        |  |  |
|            |                         |         | 7763-001 | TH     |     | 02/11/10 | 02/11/10 | BW  | Thorium, Isotopic in Liquid    |  |  |
|            |                         |         | 7763-001 | TP     |     | 02/11/10 | 02/12/10 | MWT | Americium 241/Curium in Liquid |  |  |
|            |                         |         | 7763-001 | U      |     | 02/09/10 | 02/09/10 | BW  | Uranium in Liquid              |  |  |
| S002031-02 | Lab Control Sample      |         | 7763-002 | 93A/93 |     | 02/09/10 | 02/09/10 | BW  | Gross Alpha in Liquid          |  |  |
|            |                         | LIQUID  | 7763-002 | 93B/93 |     | 02/09/10 | 02/09/10 | BW  | Gross Beta in Liquid           |  |  |
|            |                         | F10-021 | 7763-002 | GAM    |     | 02/08/10 | 02/11/10 | CSS | Gamma Scan in Liquid           |  |  |
|            |                         |         | 7763-002 | H      |     | 02/08/10 | 02/10/10 | BW  | Tritium in Liquid              |  |  |
|            |                         |         | 7763-002 | NI_L   |     | 02/09/10 | 02/12/10 | BW  | Nickel-63 in Liquid            |  |  |
|            |                         |         | 7763-002 | PU     |     | 02/11/10 | 02/11/10 | BW  | Plutonium-238,239/240, Liquid  |  |  |
|            |                         |         | 7763-002 | PU_L   |     | 02/10/10 | 02/11/10 | BW  | Plutonium 241 in Liquids       |  |  |
|            |                         |         | 7763-002 | SR     |     | 02/10/10 | 02/12/10 | BW  | Total Strontium in Liquids     |  |  |
|            |                         |         | 7763-002 | TC     |     | 02/10/10 | 02/11/10 | BW  | Technetium-99 in Liquid        |  |  |
|            |                         |         | 7763-002 | TP     |     | 02/11/10 | 02/12/10 | MWT | Americium 241/Curium in Liquid |  |  |
|            |                         |         | 7763-002 | U      |     | 02/09/10 | 02/09/10 | BW  | Uranium in Liquid              |  |  |
| S002031-03 | Method Blank            |         | 7763-003 | 93A/93 |     | 02/09/10 | 02/09/10 | BW  | Gross Alpha in Liquid          |  |  |
|            |                         | LIQUID  | 7763-003 | 93B/93 |     | 02/09/10 | 02/09/10 | BW  | Gross Beta in Liquid           |  |  |
|            |                         | F10-021 | 7763-003 | GAM    |     | 02/10/10 | 02/11/10 | CSS | Gamma Scan in Liquid           |  |  |
|            |                         |         | 7763-003 | H      |     | 02/08/10 | 02/10/10 | BW  | Tritium in Liquid              |  |  |
|            |                         |         | 7763-003 | NI_L   |     | 02/09/10 | 02/12/10 | BW  | Nickel-63 in Liquid            |  |  |
|            |                         |         | 7763-003 | PU     |     | 02/11/10 | 02/11/10 | BW  | Plutonium 238,239/240, Liquid  |  |  |
|            |                         |         | 7763-003 | PU_L   |     | 02/10/10 | 02/11/10 | BW  | Plutonium 241 in Liquids       |  |  |
|            |                         |         | 7763-003 | SR     |     | 02/10/10 | 02/12/10 | BW  | Total Strontium in Liquids     |  |  |
|            |                         |         | 7763-003 | TC     |     | 02/11/10 | 02/11/10 | BW  | Technetium-99 in Liquid        |  |  |
|            |                         |         | 7763-003 | TP     |     | 02/11/10 | 02/12/10 | MWT | Americium 241/Curium in Liquid |  |  |
|            |                         |         | 7763-003 | U      |     | 02/09/10 | 02/09/10 | BW  | Uranium in Liquid              |  |  |

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE  
 Protocol CHPRC  
 Version Ver 1.0  
 Form DVD-LWS  
 Version 3.06  
 Report date 02/12/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

SDG 7763  
 Contact N. Joseph Verville

WORK SUMMARY, cont.

Client CHPRC  
 Contract No. 33677  
 Case no SDG H4153

| LAB SAMPLE | CLIENT SAMPLE ID        |         |          |        | SUF- |          |          |     |                                |  |
|------------|-------------------------|---------|----------|--------|------|----------|----------|-----|--------------------------------|--|
| COLLECTED  | LOCATION                | MATRIX  |          |        | FIX  | ANALYZED | REVIEWED | BY  | METHOD                         |  |
| RECEIVED   | CUSTODY                 | SAF No  | PLANCHET | TEST   |      |          |          |     |                                |  |
| S002031-04 | Duplicate (S002031-01)  |         | 7763-004 | 93A/93 |      | 02/09/10 | 02/09/10 | BW  | Gross Alpha in Liquid          |  |
| 02/04/10   | Uppr&LowrAleBld;Kitchen | LIQUID  | 7763-004 | 93B/93 |      | 02/09/10 | 02/09/10 | BW  | Gross Beta in Liquid           |  |
| 02/05/10   | F10-021                 |         | 7763-004 | GAM    |      | 02/10/10 | 02/11/10 | CSS | Gamma Scan in Liquid           |  |
|            |                         |         | 7763-004 | H      |      | 02/08/10 | 02/10/10 | BW  | Tritium in Liquid              |  |
|            |                         |         | 7763-004 | NI_L   |      | 02/09/10 | 02/12/10 | BW  | Nickel-63 in Liquid            |  |
|            |                         |         | 7763-004 | PU     |      | 02/11/10 | 02/11/10 | BW  | Plutonium-238,239/240, Liquid  |  |
|            |                         |         | 7763-004 | PU_L   |      | 02/10/10 | 02/11/10 | BW  | Plutonium 241 in Liquids       |  |
|            |                         |         | 7763-004 | SR     |      | 02/10/10 | 02/12/10 | BW  | Total Strontium in Liquids     |  |
|            |                         |         | 7763-004 | TC     |      | 02/09/10 | 02/11/10 | BW  | Technetium-99 in Liquid        |  |
|            |                         |         | 7763-004 | TP     |      | 02/11/10 | 02/12/10 | MWT | Americium 241/Curium in Liquid |  |
|            |                         |         | 7763-004 | U      |      | 02/09/10 | 02/09/10 | BW  | Uranium in Liquid              |  |
| S002031-05 | Lab Control Sample      |         | 7763-005 | TH     |      | 02/11/10 | 02/11/10 | BW  | Thorium, Isotopic in Liquid    |  |
|            |                         | LIQUID  |          |        |      |          |          |     |                                |  |
|            |                         | F10-021 |          |        |      |          |          |     |                                |  |
| S002031-06 | Method Blank            |         | 7763-006 | TH     |      | 02/11/10 | 02/11/10 | BW  | Thorium, Isotopic in Liquid    |  |
|            |                         | LIQUID  |          |        |      |          |          |     |                                |  |
|            |                         | F10-021 |          |        |      |          |          |     |                                |  |
| S002031-07 | Duplicate (S002031-01)  |         | 7763-007 | TH     |      | 02/11/10 | 02/11/10 | BW  | Thorium, Isotopic in Liquid    |  |
| 02/04/10   | Uppr&LowrAleBld;Kitchen | LIQUID  |          |        |      |          |          |     |                                |  |
| 02/05/10   | F10-021                 |         |          |        |      |          |          |     |                                |  |

WORK SUMMARY

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SUMMARY DATA SECTION

Page 7

Lab id EBRLINE  
 Protocol CHPRC  
 Version Ver 1.0  
 Form DVD-LWS  
 Version 3.06  
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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

SDG 7763

Contact N. Joseph Verville

WORK SUMMARY, cont.

Client CHPRC

Contract No. 33677

Case no SDG H4153

COUNTS OF TESTS BY SAMPLE TYPE

| TEST   | SAF No  | METHOD                         | REFERENCE            | CLIENT | MORE | RE | BLANK | LCS | DUP SPIKE | TOTAL |
|--------|---------|--------------------------------|----------------------|--------|------|----|-------|-----|-----------|-------|
| 93A/93 | F10-021 | Gross Alpha in Liquid          | 900.0_ALPHABETA_GPC  | 1      |      |    | 1     | 1   | 1         | 4     |
| 93B/93 | F10-021 | Gross Beta in Liquid           | 900.0_ALPHABETA_GPC  | 1      |      |    | 1     | 1   | 1         | 4     |
| GAM    | F10-021 | Gamma Scan in Liquid           | GAMMA_GS             | 1      |      |    | 1     | 1   | 1         | 4     |
| H      | F10-021 | Tritium in Liquid              | TRITIUM_COX_LSC      | 1      |      |    | 1     | 1   | 1         | 4     |
| NI_L   | F10-021 | Nickel-63 in Liquid            | NI63_LSC             | 1      |      |    | 1     | 1   | 1         | 4     |
| PU     | F10-021 | Plutonium-238,239/240, Liquid  | PUISO_PLATE_AEA      | 1      |      |    | 1     | 1   | 1         | 4     |
| PU_L   | F10-021 | Plutonium 241 in Liquids       | PU241_IE_LSC         | 1      |      |    | 1     | 1   | 1         | 4     |
| SR     | F10-021 | Total Strontium in Liquids     | SRTOT_SEP_PRECIP_GPC | 1      |      |    | 1     | 1   | 1         | 4     |
| TC     | F10-021 | Technetium-99 in Liquid        | TC99_TR_SEP_GPC      | 1      |      |    | 1     | 1   | 1         | 4     |
| TH     | F10-021 | Thorium, Isotopic in Liquid    | THISO_IE_PLATE_AEA   | 1      |      |    | 1     | 1   | 1         | 4     |
| TP     | F10-021 | Americium 241/Curium in Liquid | AMCMISO_IE_PLATE_AEA | 1      |      |    | 1     | 1   | 1         | 4     |
| U      | F10-021 | Uranium in Liquid              | UIISO_PLATE_AEA      | 1      |      |    | 1     | 1   | 1         | 4     |
| TOTALS |         |                                |                      | 12     |      |    | 12    | 12  | 12        | 48    |

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE

Protocol CHPRC

Version Ver 1.0

Form DVD-IWS

Version 3.06

Report date 02/12/10

EBERLINE ANALYTICAL / RICHMOND  
SAMPLE DELIVERY GROUP H4153

7763-003

Method Blank

METHOD BLANK

|                                   |                                      |                  |
|-----------------------------------|--------------------------------------|------------------|
| SDG <u>7763</u>                   | Client/Case no <u>CHPRC</u>          | SDG <u>H4153</u> |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>            |                  |
| Lab sample id <u>S002031-03</u>   | Client sample id <u>Method Blank</u> |                  |
| Dept sample id <u>7763-003</u>    | Material/Matrix <u>LIQUID</u>        |                  |
|                                   | SAF No <u>F10-021</u>                |                  |

| ANALYTE           | CAS NO     | RESULT<br>pCi/mL | 2σ ERR<br>(COUNT) | MDA<br>pCi/mL | RDL<br>pCi/mL | QUALI-<br>FIERS | TEST |
|-------------------|------------|------------------|-------------------|---------------|---------------|-----------------|------|
| Gross Alpha       | 12587-46-1 | 0.792            | 1.8               | 3.80          | 10.0          | U               | 93A  |
| Gross Beta        | 12587-47-2 | -0.988           | 2.5               | 4.52          | 15.0          | U               | 93B  |
| Tritium           | 10028-17-8 | -4.13            | 49                | 84.6          | 400           | U               | H    |
| Nickel 63         | 13981-37-8 | -0.229           | 1.5               | 2.53          | 30.0          | U               | NI_L |
| Total Strontium   | SR-RAD     | -0.012           | 0.15              | 0.304         | 1.00          | U               | SR   |
| Technetium 99     | 14133-76-7 | -0.006           | 0.10              | 0.294         | 15.0          | U               | TC   |
| Uranium 233/234   | U-233/234  | 0                | 0.061             | 0.235         | 1.00          | U               | U    |
| Uranium 235       | 15117-96-1 | 0                | 0.074             | 0.284         | 1.00          | U               | U    |
| Uranium 238       | U-238      | 0                | 0.061             | 0.235         | 1.00          | U               | U    |
| Americium 241     | 14596-10-2 | 0                | 0.085             | 0.203         |               | U               | TP   |
| Curium 242        | 15510-73-3 | 0                | 0.042             | 0.162         | 1.00          | U               | TP   |
| Curium 243/244    | CM-243/244 | 0                | 0.042             | 0.162         | 1.00          | U               | TP   |
| Plutonium 238     | 13981-16-3 | 0                | 0.23              | 0.558         | 1.00          | U               | PU   |
| Plutonium 239/240 | PU-239/240 | 0                | 0.12              | 0.446         | 1.00          | U               | PU   |
| Plutonium 241     | 14119-32-5 | -1.58            | 10                | <u>16.9</u>   | 15.0          | U               | PU_L |
| Tin 126           | 15832-50-5 | U                |                   | 0.056         |               | U               | GAM  |
| Beryllium 7       | 13966-02-4 | U                |                   | 0.270         |               | U               | GAM  |
| Potassium 40      | 13966-00-2 | U                |                   | 1.27          |               | U               | GAM  |
| Cobalt 60         | 10198-40-0 | U                |                   | 0.040         | 0.050         | U               | GAM  |
| Ruthenium 106     | 13967-48-1 | U                |                   | 0.390         |               | U               | GAM  |
| Antimony 125      | 14234-35-6 | U                |                   | 0.103         |               | U               | GAM  |
| Cesium 134        | 13967-70-9 | U                |                   | 0.046         |               | U               | GAM  |
| Cesium 137        | 10045-97-3 | U                |                   | 0.044         | 0.050         | U               | GAM  |
| Europium 152      | 14683-23-9 | U                |                   | <u>0.120</u>  | 0.100         | U               | GAM  |
| Europium 154      | 15585-10-1 | U                |                   | <u>0.125</u>  | 0.100         | U               | GAM  |
| Europium 155      | 14391-16-3 | U                |                   | 0.094         | 0.100         | U               | GAM  |
| Niobium 94        | 14681-63-1 | U                |                   | 0.035         |               | U               | GAM  |
| Radium 226        | 13982-63-3 | U                |                   | 0.078         | 0.100         | U               | GAM  |
| Radium 228        | 15262-20-1 | U                |                   | 0.190         | 0.200         | U               | GAM  |

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|                             |
|-----------------------------|
| Lab id <u>EBRLNE</u>        |
| Protocol <u>CHPRC</u>       |
| Version <u>Ver 1.0</u>      |
| Form <u>DVD-DS</u>          |
| Version <u>3.06</u>         |
| Report date <u>02/12/10</u> |

EBERLINE ANALYTICAL / RICHMOND  
SAMPLE DELIVERY GROUP H4153

7763-003

Method Blank

BLANK, cont.

|                                   |                                      |                  |
|-----------------------------------|--------------------------------------|------------------|
| SDG <u>7763</u>                   | Client/Case no <u>CHPRC</u>          | SDG <u>H4153</u> |
| Contact <u>N. Joseph Verville</u> | Contract <u>No. 33677</u>            |                  |
| Lab sample id <u>S002031-03</u>   | Client sample id <u>Method Blank</u> |                  |
| Dept sample id <u>7763-003</u>    | Material/Matrix <u>LIQUID</u>        |                  |
|                                   | SAF No <u>F10-021</u>                |                  |

|                 |
|-----------------|
| QC-BLANK #72284 |
|-----------------|

|                             |
|-----------------------------|
| Lab id <u>EBRLNE</u>        |
| Protocol <u>CHPRC</u>       |
| Version <u>Ver 1.0</u>      |
| Form <u>DVD-DS</u>          |
| Version <u>3.06</u>         |
| Report date <u>02/12/10</u> |

EBERLINE ANALYTICAL / RICHMOND  
 SAMPLE DELIVERY GROUP H4153

7763-006

Method Blank

METHOD BLANK

|                                   |                                      |                  |
|-----------------------------------|--------------------------------------|------------------|
| SDG <u>7763</u>                   | Client/Case no <u>CHPRC</u>          | SDG <u>H4153</u> |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>            |                  |
| Lab sample id <u>S002031-06</u>   | Client sample id <u>Method Blank</u> |                  |
| Dept sample id <u>7763-006</u>    | Material/Matrix <u>LIQUID</u>        |                  |
|                                   | SAF No <u>F10-021</u>                |                  |

| ANALYTE     | CAS NO     | RESULT<br>pCi/mL | 2 $\sigma$ ERR<br>(COUNT) | MDA<br>pCi/mL | RDL<br>pCi/mL | QUALI-<br>FIERS | TEST |
|-------------|------------|------------------|---------------------------|---------------|---------------|-----------------|------|
| Thorium 228 | 14274-82-9 | 0                | 0.19                      | 0.382         | 1.00          | U               | TH   |
| Thorium 230 | 14269-63-7 | 0.093            | 0.31                      | 0.593         | 1.00          | U               | TH   |
| Thorium 232 | TH-232     | -0.031           | 0.062                     | 0.238         | 1.00          | U               | TH   |

QC-BLANK #72307

|                             |
|-----------------------------|
| Lab id <u>EBRLNE</u>        |
| Protocol <u>CHPRC</u>       |
| Version <u>Ver 1.0</u>      |
| Form <u>DVD-DS</u>          |
| Version <u>3.06</u>         |
| Report date <u>02/12/10</u> |

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

7763-002

Lab Control Sample

LAB CONTROL SAMPLE

|                                   |  |                  |
|-----------------------------------|--|------------------|
| SDG <u>7763</u>                   | Client/Case no <u>CHPRC</u>                | <u>SDG H4153</u> |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>                  |                  |
| Lab sample id <u>S002031-02</u>   | Client sample id <u>Lab Control Sample</u> |                  |
| Dept sample id <u>7763-002</u>    | Material/Matrix <u>LIQUID</u>              |                  |
|                                   | SAF No <u>F10-021</u>                      |                  |

| ANALYTE           | RESULT<br>pCi/mL | 2σ ERR<br>(COUNT) | MDA<br>pCi/mL | RDL<br>pCi/mL | QUALI-<br>FIERS | TEST | ADDED<br>pCi/mL | 2σ ERR<br>pCi/mL | REC<br>% | 3σ LMDS<br>(TOTAL) | PROTOCOL<br>LIMITS |
|-------------------|------------------|-------------------|---------------|---------------|-----------------|------|-----------------|------------------|----------|--------------------|--------------------|
| Gross Alpha       | 96.7             | 12                | 3.38          | 10.0          |                 | 93A  | 91.8            | 3.7              | 105      | 62-138             | 70-130             |
| Gross Beta        | 76.4             | 6.7               | 5.86          | 15.0          |                 | 93B  | 81.4            | 3.3              | 94       | 79-121             | 70-130             |
| Tritium           | 10200            | 240               | 82.0          | 400           |                 | H    | 11200           | 450              | 91       | 85-115             | 80-120             |
| Nickel 63         | 198              | 5.7               | 2.53          | 30.0          |                 | NI_L | 218             | 8.7              | 91       | 83-117             | 80-120             |
| Total Strontium   | 8.99             | 0.53              | 0.246         | 1.00          |                 | SR   | 8.06            | 0.32             | 112      | 79-121             | 80-120             |
| Technetium 99     | 82.0             | 1.8               | 0.327         | 15.0          |                 | TC   | 73.6            | 2.9              | 111      | 77-123             | 80-120             |
| Uranium 233/234   | 8.71             | 1.4               | 0.799         | 1.00          |                 | U    | 9.87            | 0.39             | 88       | 76-124             | 80-120             |
| Uranium 235       | 6.93             | 1.3               | 0.325         | 1.00          |                 | U    | 8.02            | 0.32             | 86       | 73-127             | 80-120             |
| Uranium 238       | 9.56             | 1.5               | 0.759         | 1.00          |                 | U    | 10.7            | 0.43             | 89       | 76-124             | 80-120             |
| Americium 241     | 8.33             | 1.0               | 0.252         |               |                 | TP   | 8.82            | 0.35             | 94       | 79-121             | 80-120             |
| Curium 243/244    | 6.94             | 0.94              | 0.252         | 1.00          |                 | TP   | 7.51            | 0.30             | 92       | 77-123             | 80-120             |
| Plutonium 238     | 10.2             | 1.7               | 0.340         | 1.00          |                 | PU   | 10.1            | 0.40             | 101      | 71-129             | 80-120             |
| Plutonium 239/240 | 9.87             | 1.7               | 0.340         | 1.00          |                 | PU   | 11.5            | 0.46             | 86       | 75-125             | 80-120             |
| Plutonium 241     | 266              | 17                | <u>18.2</u>   | 15.0          |                 | PU_L | 292             | 12               | 91       | 80-120             | 80-120             |
| Cobalt 60         | 2.47             | 0.12              | <u>0.070</u>  | 0.050         |                 | GAM  | 2.31            | 0.092            | 107      | 85-115             | 80-120             |
| Cesium 137        | 2.42             | 0.10              | <u>0.074</u>  | 0.050         |                 | GAM  | 2.25            | 0.090            | 108      | 86-114             | 80-120             |

QC-LCS #72283

|                             |
|-----------------------------|
| Lab id <u>EBRLNE</u>        |
| Protocol <u>CHPRC</u>       |
| Version <u>Ver 1.0</u>      |
| Form <u>DVD-LCS</u>         |
| Version <u>3.06</u>         |
| Report date <u>02/12/10</u> |

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

7763-005

Lab Control Sample

LAB CONTROL SAMPLE

|                                   |  |                  |
|-----------------------------------|--|------------------|
| SDG <u>7763</u>                   | Client/Case no <u>CHPRC</u>                | <u>SDG H4153</u> |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>                  |                  |
| Lab sample id <u>S002031-05</u>   | Client sample id <u>Lab Control Sample</u> |                  |
| Dept sample id <u>7763-005</u>    | Material/Matrix <u>LIQUID</u>              |                  |
|                                   | SAF No <u>F10-021</u>                      |                  |

| ANALYTE     | RESULT<br>pCi/mL | 2σ ERR<br>(COUNT) | MDA<br>pCi/mL | RDL<br>pCi/mL | QUALI-<br>FIERS | TEST | ADDED<br>pCi/mL | 2σ ERR<br>pCi/mL | REC<br>% | 3σ LMITS<br>(TOTAL) | PROTOCOL<br>LIMITS |
|-------------|------------------|-------------------|---------------|---------------|-----------------|------|-----------------|------------------|----------|---------------------|--------------------|
| Thorium 230 | 18.4             | 2.2               | 0.634         | 1.00          |                 | TH   | 16.9            | 0.68             | 109      | 76-124              | 80-120             |

QC-LCS #72306

|                             |
|-----------------------------|
| Lab id <u>EBRLNE</u>        |
| Protocol <u>CHPRC</u>       |
| Version <u>Ver 1.0</u>      |
| Form <u>DVD-LCS</u>         |
| Version <u>2.06</u>         |
| Report date <u>02/12/10</u> |

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

7763-004

B23K14

DUPLICATE

|                                   |                                 |   |
|-----------------------------------|---------------------------------|---|
| SDG <u>7763</u>                   | Client/Case no <u>CHPRC</u>     | SDG <u>H4153</u>  |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>       |   |
| DUPLICATE                         | ORIGINAL                        |   |
| Lab sample id <u>S002031-04</u>   | Lab sample id <u>S002031-01</u> | Client sample id <u>B23K14</u>                            |
| Dept sample id <u>7763-004</u>    | Dept sample id <u>7763-001</u>  | Location/Matrix <u>Uppr&amp;LowrAleBld;Kitchen LIQUID</u> |
|                                   | Received <u>02/05/10</u>        | Collected/Volume <u>02/04/10 16:57 620 mL</u>             |
|                                   |                                 | Custody/SAF No <u>F10-021-025 F10-021</u>                 |

| ANALYTE           | DUPLICATE<br>pCi/mL | 2σ ERR<br>(COUNT) | MDA<br>pCi/mL | RDL<br>pCi/mL | QUALI-<br>FIERS | TEST | ORIGINAL<br>pCi/mL | 2σ ERR<br>(COUNT) | MDA<br>pCi/mL | QUALI-<br>FIERS | RPD<br>% | 3σ<br>TOT | DER<br>σ |
|-------------------|---------------------|-------------------|---------------|---------------|-----------------|------|--------------------|-------------------|---------------|-----------------|----------|-----------|----------|
| Gross Alpha       | 0.101               | 0.85              | 1.70          | 10.0          | U               | 93A  | 0.450              | 0.99              | 1.76          | U               | -        |           | 0.5      |
| Gross Beta        | 22.9                | 4.0               | 4.78          | 15.0          |                 | 93B  | 19.0               | 3.7               | 4.38          |                 | 19       | 46        | 1.2      |
| Tritium           | -1.29               | 46                | 79.2          | 400           | U               | H    | 10.0               | 45                | 77.1          | U               | -        |           | 0.4      |
| Nickel 63         | -0.033              | 1.3               | 2.19          | 30.0          | U               | NI_L | 1.09               | 1.3               | 2.19          | U               | -        |           | 1.2      |
| Total Strontium   | 0.258               | 0.17              | 0.297         | 1.00          | U               | SR   | 0.215              | 0.14              | 0.243         | U               | -        |           | 0.4      |
| Technetium 99     | -0.019              | 0.094             | 0.251         | 15.0          | U               | TC   | -0.073             | 0.080             | 0.255         | U               | -        |           | 0.9      |
| Uranium 233/234   | 0                   | 0.043             | 0.165         | 1.00          | U               | U    | -0.022             | 0.044             | 0.169         | U               | -        |           | 0.7      |
| Uranium 235       | 0.026               | 0.052             | 0.200         | 1.00          | U               | U    | 0                  | 0.053             | 0.204         | U               | -        |           | 0.7      |
| Uranium 238       | 0.043               | 0.043             | 0.165         | 1.00          | U               | U    | 0                  | 0.044             | 0.169         | U               | -        |           | 1.4      |
| Americium 241     | 0.088               | 0.13              | 0.242         |               | U               | TP   | 0                  | 0.092             | 0.255         | U               | -        |           | 1.1      |
| Curium 242        | -0.023              | 0.045             | 0.173         | 1.00          | U               | TP   | 0.024              | 0.095             | 0.182         | U               | -        |           | 0.9      |
| Curium 243/244    | 0                   | 0.088             | 0.210         | 1.00          | U               | TP   | 0                  | 0.092             | 0.221         | U               | -        |           | 0        |
| Plutonium 238     | -0.055              | 0.22              | 0.526         | 1.00          | U               | PU   | 0.043              | 0.087             | 0.331         | U               | -        |           | 0.8      |
| Plutonium 239/240 | 0.110               | 0.22              | 0.420         | 1.00          | U               | PU   | 0.130              | 0.17              | 0.331         | U               | -        |           | 0.1      |
| Plutonium 241     | -6.97               | 12                | <u>20.0</u>   | 15.0          | U               | PU_L | 0.812              | 11                | <u>19.1</u>   | U               | -        |           | 1.0      |
| Tin 126           | U                   |                   | 0.035         |               | U               | GAM  | U                  |                   | 0.043         | U               | -        |           | 0.3      |
| Beryllium 7       | U                   |                   | 0.269         |               | U               | GAM  | U                  |                   | 0.321         | U               | -        |           | 0.2      |
| Potassium 40      | 9.88                | 0.75              | 0.400         |               |                 | GAM  | 11.0               | 0.88              | 0.445         |                 | 11       | 22        | 1.4      |
| Cobalt 60         | U                   |                   | 0.041         | 0.050         | U               | GAM  | U                  |                   | <u>0.052</u>  | U               | -        |           | 0.3      |
| Ruthenium 106     | U                   |                   | 0.276         |               | U               | GAM  | U                  |                   | 0.358         | U               | -        |           | 0.4      |
| Antimony 125      | U                   |                   | 0.083         |               | U               | GAM  | U                  |                   | 0.096         | U               | -        |           | 0.2      |
| Cesium 134        | U                   |                   | 0.043         |               | U               | GAM  | U                  |                   | 0.053         | U               | -        |           | 0.3      |
| Cesium 137        | U                   |                   | 0.034         | 0.050         | U               | GAM  | U                  |                   | 0.044         | U               | -        |           | 0.4      |
| Europium 152      | U                   |                   | 0.098         | 0.100         | U               | GAM  | U                  |                   | 0.096         | U               | -        |           | 0        |
| Europium 154      | U                   |                   | <u>0.125</u>  | 0.100         | U               | GAM  | U                  |                   | <u>0.168</u>  | U               | -        |           | 0.4      |
| Europium 155      | U                   |                   | 0.076         | 0.100         | U               | GAM  | U                  |                   | 0.083         | U               | -        |           | 0.1      |
| Niobium 94        | U                   |                   | 0.034         |               | U               | GAM  | U                  |                   | 0.040         | U               | -        |           | 0.2      |
| Radium 226        | U                   |                   | 0.076         | 0.100         | U               | GAM  | U                  |                   | 0.082         | U               | -        |           | 0.1      |

DUPLICATES

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| Lab id <u>EBERLINE</u>      |
| Protocol <u>CHPRC</u>       |
| Version <u>Ver 1.0</u>      |
| Form <u>DVD-DUP</u>         |
| Version <u>3.05</u>         |
| Report date <u>02/12/10</u> |

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

7763-004

B23K14

DUPLICATE, cont.

|                                   |                                 |   |
|-----------------------------------|---------------------------------|---|
| SDG <u>7763</u>                   | Client/Case no <u>CHPRC</u>     | SDG <u>H4153</u>  |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>       |   |
| DUPLICATE                         | ORIGINAL                        |   |
| Lab sample id <u>S002031-04</u>   | Lab sample id <u>S002031-01</u> | Client sample id <u>B23K14</u>                                  |
| Dept sample id <u>7763-004</u>    | Dept sample id <u>7763-001</u>  | Location/Matrix <u>Upr&amp;LowrAleBld;Kitchen</u> <u>LIQUID</u> |
|                                   | Received <u>02/05/10</u>        | Collected/Volume <u>02/04/10 10:57</u> <u>620 mL</u>            |
|                                   |                                 | Custody/SAF No <u>F10-021-025</u> <u>F10-021</u>                |

| ANALYTE    | DUPLICATE<br>pCi/mL | 2σ ERR<br>(COUNT) | MDA<br>pCi/mL | RDL<br>pCi/mL | QUALI-<br>FIERS | TEST | ORIGINAL<br>pCi/mL | 2σ ERR<br>(COUNT) | MDA<br>pCi/mL | QUALI-<br>FIERS | RPD<br>% | 3σ<br>TOT | DER<br>σ |
|------------|---------------------|-------------------|---------------|---------------|-----------------|------|--------------------|-------------------|---------------|-----------------|----------|-----------|----------|
| Radium 228 | U                   |                   | 0.146         | 0.200         | U               | GAM  | U                  |                   | 0.199         | U               | -        |           | 0.4      |

QC DUP#1 72285

ARRA Upper & Lower ALE Building Science Laboratory -  
Other Liquids

DUPLICATES

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SUMMARY DATA SECTION

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|                             |
|-----------------------------|
| Lab id <u>EBRLNE</u>        |
| Protocol <u>CHPRC</u>       |
| Version <u>Ver 1.0</u>      |
| Form <u>DVD-DUP</u>         |
| Version <u>3.06</u>         |
| Report date <u>02/12/10</u> |

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

7763-007

B23K14

DUPLICATE

|                                   |                                 |   |
|-----------------------------------|---------------------------------|---|
| SDG <u>7763</u>                   | Client/Case no <u>CHPRC</u>     | SDG <u>H4153</u>  |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>       |   |
| DUPLICATE                         | ORIGINAL                        |   |
| Lab sample id <u>S002031-07</u>   | Lab sample id <u>S002031-01</u> | Client sample id <u>B23K14</u>                              |
| Dept sample id <u>7763-007</u>    | Dept sample id <u>7763-001</u>  | Location/Matrix <u>Upper&amp;LowerAleBld;Kitchen LIQUID</u> |
|                                   | Received <u>02/05/10</u>        | Collected/Volume <u>02/04/10 10:57 620 mL</u>               |
|                                   |                                 | Custody/SAF No <u>F10-021-025 F10-021</u>                   |

| ANALYTE     | DUPLICATE<br>pCi/mL | 2σ ERR<br>(COUNT) | MDA<br>pCi/mL | RDL<br>pCi/mL | QUALI-<br>FIERS | TEST | ORIGINAL<br>pCi/mL | 2σ ERR<br>(COUNT) | MDA<br>pCi/mL | QUALI-<br>FIERS | RPD<br>% | 3σ<br>TOT | DER<br>σ |
|-------------|---------------------|-------------------|---------------|---------------|-----------------|------|--------------------|-------------------|---------------|-----------------|----------|-----------|----------|
| Thorium 228 | 0.043               | 0.26              | 0.532         | 1.00          | U               | TH   | 0.024              | 0.14              | 0.295         | U               | -        |           | 0.5      |
| Thorium 230 | 0.087               | 0.35              | 0.766         | 1.00          | U               | TH   | 0.215              | 0.29              | 0.503         | U               | -        |           | 0.6      |
| Thorium 232 | 0.043               | 0.17              | 0.331         | 1.00          | U               | TH   | -0.024             | 0.048             | 0.183         | U               | -        |           | 0.8      |

QC-DUP#1 72308

ARRA Upper & Lower ALE Building Science Laboratory -  
Other Liquids

DUPLICATES

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SUMMARY DATA SECTION

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|                             |
|-----------------------------|
| Lab id <u>EBRLNE</u>        |
| Protocol <u>CHPRC</u>       |
| Version <u>Ver 1.0</u>      |
| Form <u>DVD-DUP</u>         |
| Version <u>3.06</u>         |
| Report date <u>02/12/10</u> |

EBERLINE ANALYTICAL / RICHMOND  
SAMPLE DELIVERY GROUP H4153

7763-001

B23K14

DATA SHEET

|                                   |  |                  |
|-----------------------------------|--|------------------|
| SDG <u>7763</u>                   | Client/Case no <u>CHPRC</u>                        | SDG <u>H4153</u> |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>                          |                  |
| Lab sample id <u>S002031-01</u>   | Client sample id <u>B23K14</u>                     |                  |
| Dept sample id <u>7763-001</u>    | Location/Matrix <u>Uppr&amp;LowrAleBld;Kitchen</u> | <u>LIQUID</u>    |
| Received <u>02/05/10</u>          | Collected/Volume <u>02/04/10 10:57</u>             | <u>620 mL</u>    |
|                                   | Custody/SAF No <u>F10-021-025</u>                  | <u>F10-021</u>   |

| ANALYTE           | CAS NO     | RESULT<br>pCi/mL | 2σ ERR<br>(COUNT) | MDA<br>pCi/mL | RDL<br>pCi/mL | QUALI-<br>FIERS | TEST |
|-------------------|------------|------------------|-------------------|---------------|---------------|-----------------|------|
| Gross Alpha       | 12587-46-1 | 0.450            | 0.99              | 1.76          | 10.0          | U               | 93A  |
| Gross Beta        | 12587-47-2 | 19.0             | 3.7               | 4.38          | 15.0          |                 | 93B  |
| Tritium           | 10028-17-8 | 10.0             | 45                | 77.1          | 400           | U               | H    |
| Nickel 63         | 13981-37-8 | 1.09             | 1.3               | 2.19          | 30.0          | U               | NI_L |
| Total Strontium   | SR-RAD     | 0.215            | 0.14              | 0.243         | 1.00          | U               | SR   |
| Technetium 99     | 14133-76-7 | -0.073           | 0.080             | 0.255         | 15.0          | U               | TC   |
| Thorium 228       | 14274-82-9 | -0.024           | 0.14              | 0.295         | 1.00          | U               | TH   |
| Thorium 230       | 14269-63-7 | 0.215            | 0.29              | 0.503         | 1.00          | U               | TH   |
| Thorium 232       | TH-232     | -0.024           | 0.048             | 0.183         | 1.00          | U               | TH   |
| Uranium 233/234   | U-233/234  | -0.022           | 0.044             | 0.169         | 1.00          | U               | U    |
| Uranium 235       | 15117-96-1 | 0                | 0.053             | 0.204         | 1.00          | U               | U    |
| Uranium 238       | U-238      | 0                | 0.044             | 0.169         | 1.00          | U               | U    |
| Americium 241     | 14596-10-2 | 0                | 0.092             | 0.255         |               | U               | TP   |
| Curium 242        | 15510-73-3 | 0.024            | 0.095             | 0.182         | 1.00          | U               | TP   |
| Curium 243/244    | CM-243/244 | 0                | 0.092             | 0.221         | 1.00          | U               | TP   |
| Plutonium 238     | 13981-16-3 | 0.043            | 0.087             | 0.331         | 1.00          | U               | PU   |
| Plutonium 239/240 | PU-239/240 | 0.130            | 0.17              | 0.331         | 1.00          | U               | PU   |
| Plutonium 241     | 14119-32-5 | 0.812            | 11                | <u>19.1</u>   | 15.0          | U               | PU_L |
| Tin 126           | 15832-50-5 | U                |                   | 0.043         |               | U               | GAM  |
| Beryllium 7       | 13966-02-4 | U                |                   | 0.321         |               | U               | GAM  |
| Potassium 40      | 13966-00-2 | 11.0             | 0.88              | 0.445         |               |                 | GAM  |
| Cobalt 60         | 10198-40-0 | U                |                   | <u>0.052</u>  | 0.050         | U               | GAM  |
| Ruthenium 106     | 13967-48-1 | U                |                   | 0.358         |               | U               | GAM  |
| Antimony 125      | 14234-35-6 | U                |                   | 0.096         |               | U               | GAM  |
| Cesium 134        | 13967-70-9 | U                |                   | 0.053         |               | U               | GAM  |
| Cesium 137        | 10045-97-3 | U                |                   | 0.044         | 0.050         | U               | GAM  |
| Europium 152      | 14683-23-9 | U                |                   | 0.096         | 0.100         | U               | GAM  |
| Europium 154      | 15585-10-1 | U                |                   | <u>0.168</u>  | 0.100         | U               | GAM  |

DATA SHEETS  
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SUMMARY DATA SECTION  
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|                             |
|-----------------------------|
| Lab id <u>EBRLNE</u>        |
| Protocol <u>CHPRC</u>       |
| Version <u>Ver 1.0</u>      |
| Form <u>DVD-DS</u>          |
| Version <u>3.06</u>         |
| Report date <u>02/12/10</u> |

EBERLINE ANALYTICAL / RICHMOND  
SAMPLE DELIVERY GROUP H4153

7763-001

B23K14

DATA SHEET, cont

|                                   |  |                  |
|-----------------------------------|--|------------------|
| SDG <u>7763</u>                   | Client/Case no <u>CHPRC</u>                        | SDG <u>H4153</u> |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>                          |                  |
| Lab sample id <u>S002031-01</u>   | Client sample id <u>B23K14</u>                     |                  |
| Dept sample id <u>7763-001</u>    | Location/Matrix <u>Uppr&amp;LowrAleBld;Kitchen</u> | <u>LIQUID</u>    |
| Received <u>02/05/10</u>          | Collected/Volume <u>02/04/10 10:57</u>             | <u>620 mL</u>    |
|                                   | Custody/SAF No <u>F10-021-025</u>                  | <u>F10-021</u>   |

| ANALYTE      | CAS NO     | RESULT<br>pCi/mL | 2σ ERR<br>(COUNT) | MDA<br>pCi/mL | RDL<br>pCi/mL | QUALI-<br>FIERS | TEST |
|--------------|------------|------------------|-------------------|---------------|---------------|-----------------|------|
| Europium 155 | 14391-16-3 | U                |                   | 0.083         | 0.100         | U               | GAM  |
| Niobium 94   | 14681-63-1 | U                |                   | 0.040         |               | U               | GAM  |
| Radium 226   | 13982-63-3 | U                |                   | 0.082         | 0.100         | U               | GAM  |
| Radium 228   | 15262-20-1 | U                |                   | 0.199         | 0.200         | U               | GAM  |

ARRA Upper & Lower ALE Building Science Laboratory -  
Other Liquids

|                             |
|-----------------------------|
| Lab id <u>EBRLNE</u>        |
| Protocol <u>CHPRC</u>       |
| Version <u>Ver 1.0</u>      |
| Form <u>DVD-DS</u>          |
| Version <u>3.06</u>         |
| Report date <u>02/12/10</u> |

**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP H4153

Test: PJ Matrix LIQUID  
 SDG 7763  
 Contact: N. Joseph Verville

**LAB METHOD SUMMARY**

PLUTONIUM-238,239/240, LIQUID

ALPHA SPECTROSCOPY

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4153

**RESULTS**

| LAB                                   | RAW      | SUF-     |                        | Plutonium | Plutonium |
|---------------------------------------|----------|----------|------------------------|-----------|-----------|
| SAMPLE ID                             | TEST FIX | PLANCHET | CLIENT SAMPLE ID       | 238       | 239/240   |
| Preparation batch 7243-084            |          |          |                        |           |           |
| S002031-01                            |          | 7763-001 | B23K14                 | U         | U         |
| S002031-02                            |          | 7763-002 | Lab Control Sample     | ok        | ok        |
| S002031-03                            |          | 7763-003 | Method Blank           | U         | U         |
| S002031-04                            |          | 7763 004 | Duplicate (S002031-01) | - U       | - U       |
| Nominal values and limits from method |          |          |                        |           |           |
|                                       |          |          | RDLs (pCi/mL)          | 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/mL  | mL    | FAC  | TION  | %      | %   | min   | keV  | KeV   | HELD | PREPARED | YZED  | DETECTOR |
| Preparation batch 7243-084      2σ prep error 8.0 %      Reference Lab Notebook No. 7243 pg 84 |          |                        |         |       |      |       |        |     |       |      |       |      |          |       |          |
| S002031-01   |          | B23K14                 | 0.331   | 0.575 |      |       | 40     |     | 109   |      |       | 7    | 02/10/10 | 02/11 | SS-053   |
| S002031-02   |          | Lab Control Sample     | 0.340   | 0.575 |      |       | 39     |     | 110   |      |       |      | 02/10/10 | 02/11 | SS-054   |
| S002031-03   |          | Method Blank           | 0.558   | 0.575 |      |       | 31     |     | 113   |      |       |      | 02/10/10 | 02/11 | SS-061   |
| S002031-04   |          | Duplicate (S002031-01) | 0.526   | 0.575 |      |       | 32     |     | 113   |      |       | 7    | 02/10/10 | 02/11 | SS-062   |
| Nominal values and limits from method  |          |                        |         |       |      |       |        |     |       |      |       |      |          |       |          |
|  |          |                        | 1.00    | 0.575 |      |       | 30-110 |     | 50    |      |       |      |          |       | 180      |

| PROCEDURES | REFERENCE | PUISO_PLATE_AEA   |
|------------|-----------|---|
|            | SPP-040   | Environmental Water Dissolution, rev 2  |
|            | 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>6.439</u> ± <u>0.240</u> |
| FOR 4 SAMPLES   | YIELD | <u>36</u> ± <u>9</u>        |

METHOD SUMMARIES

Page 1

SUMMARY DATA SECTION

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Lab id EBERLINE  
 Protocol CHPRC  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 02/12/10

**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP H4153

Test TH Matrix LIQUID  
SDG 7763  
Contact N. Joseph Verville

**LAB METHOD SUMMARY**

THORIUM, ISOTOPIC IN LIQUID  
ALPHA SPECTROSCOPY

Client CHPRC  
Contract No. 33677  
Contract SDG H4153

**RESULTS**

| LAB                                   | RAW      | SUF-     |                        |               |             |             |      |  |  |
|---------------------------------------|----------|----------|------------------------|---------------|-------------|-------------|------|--|--|
| SAMPLE ID                             | TEST FIX | PLANCHET | CLIENT SAMPLE ID       | Thorium 228   | Thorium 230 | Thorium 232 |      |  |  |
| Preparation batch 7243-084            |          |          |                        |               |             |             |      |  |  |
| 3002031-01                            |          | 7763-001 | B23K14                 | U             | U           | U           |      |  |  |
| 3002031-05                            |          | 7763-005 | Lab Control Sample     |               | ok          |             |      |  |  |
| 3002031-06                            |          | 7763-006 | Method Blank           | U             | U           | U           |      |  |  |
| 3002031-07                            |          | 7763-007 | Duplicate (S002031-01) | - U           | - U         | - U         |      |  |  |
| Nominal values and limits from method |          |          |                        | RDLs (pCi/mL) | 1.00        | 1.00        | 1.00 |  |  |

**METHOD PERFORMANCE**

| LAB  | RAW      | SUF-                   |  | MAX MDA | ALIQ  | PREP | DISS- | YIELD  | EFF | COUNT | FWHM | DRIFT | DAYS | ANAL-    |       |          |
|--|----------|------------------------|--|---------|-------|------|-------|--------|-----|-------|------|-------|------|----------|-------|----------|
| SAMPLE ID  | TEST FIX | CLIENT SAMPLE ID       |  | pCi/mL  | mL    | FAC  | TION  | %      | %   | min   | keV  | KeV   | HELD | PREPARED | YZED  | DETECTOR |
| Preparation batch 7243-084      2σ prep error 8.0 %      Reference Lab Notebook No. 7243 pg 84 |          |                        |  |         |       |      |       |        |     |       |      |       |      |          |       |          |
| S002031-01   |          | B23K14                 |  | 0.503   | 0.287 |      |       | 102    |     | 163   |      |       | 7    | 02/11/10 | 02/11 | SS-035   |
| S002031-05   |          | Lab Control Sample     |  | 0.634   | 0.280 |      |       | 74     |     | 164   |      |       |      | 02/11/10 | 02/11 | SS-036   |
| S002031-06   |          | Method Blank           |  | 0.593   | 0.280 |      |       | 81     |     | 164   |      |       |      | 02/11/10 | 02/11 | SS-037   |
| S002031-07   |          | Duplicate (S002031-01) |  | 0.766   | 0.287 |      |       | 66     |     | 164   |      |       | 7    | 02/11/10 | 02/11 | SS-038   |
| Nominal values and limits from method  |          |                        |  | 1.00    | 0.280 |      |       | 30-110 |     | 100   | 100  |       | 180  |          |       |          |

| PROCEDURES | REFERENCE | THISO_IE_PLATE_AFA   |
|------------|-----------|--|
| SPP-040    |           | Environmental Water Dissolution, rev 2   |
| CP-900     |           | Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 5 |
| CP-008     |           | Heavy Element Electroplating, rev 13   |

|                 |       |               |
|-----------------|-------|---------------|
| AVERAGES ± 2 SD | MDA   | 0.624 ± 0.219 |
| FOR 4 SAMPLES   | YIELD | 81 ± 31       |

METHOD SUMMARIES

Page 2

SUMMARY DATA SECTION

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Lab id EBRLNE  
Protocol CHPRC  
Version Ver 1.0  
Form DVD-LMS  
Version 3.06  
Report date 02/12/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

LAB METHOD SUMMARY

AMERICIUM 241/CURIUM IN LIQUID

ALPHA SPECTROSCOPY

Test TP Matrix LIQUID  
SDG 7763  
Contact N. Joseph Verville

Client CHPRC  
Contract No. 33677  
Contract SDG H4153

RESULTS

| LAB                                   | RAW      | SUF-     |                        | Americium     | Curium  |
|---------------------------------------|----------|----------|------------------------|---------------|---------|
| SAMPLE ID                             | TEST FIX | PLANCHET | CLIENT SAMPLE ID       | 241           | 243/244 |
| Preparation batch 7243-084            |          |          |                        |               |         |
| S002031-01                            |          | 7763-001 | B23K14                 | U             | U       |
| S002031-02                            |          | 7763-002 | Lab Control Sample     | ok            | ok      |
| S002031-03                            |          | 7763-003 | Method Blank           | U             | U       |
| S002031-04                            |          | 7763-004 | Duplicate (S002031-01) | - U           | - U     |
| Nominal values and limits from method |          |          |                        | RDLs (pCi/mL) | 1.00    |

METHOD PERFORMANCE

| LAB  | RAW      | SUF-                   |           | MAX MDA | ALIQ  | PREP | DILU- | YIELD  | EPF | COUNT | FWHM | DRIFT | DAYS     | ANAL- |          |
|--|----------|------------------------|-----------|---------|-------|------|-------|--------|-----|-------|------|-------|----------|-------|----------|
| SAMPLE ID  | TEST FIX | CLIENT                 | SAMPLE ID | pCi/mL  | mL    | FAC  | TION  | %      | %   | min   | keV  | KeV   | HELD     | YZED  | DETECTOR |
| Preparation batch 7243-084      2σ prep error 8.0 %      Reference Lab Notebook No. 7243 pg 84 |          |                        |           |         |       |      |       |        |     |       |      |       |          |       |          |
| S002031-01   |          | B23K14                 |           | 0.221   | 0.575 |      |       | 73     |     | 120   |      | 7     | 02/11/10 | 02/11 | SS-062   |
| S002031-02   |          | Lab Control Sample     |           | 0.252   | 0.575 |      |       | 73     |     | 119   |      |       | 02/11/10 | 02/11 | SS-063   |
| S002031-03   |          | Method Blank           |           | 0.162   | 0.575 |      |       | 85     |     | 119   |      |       | 02/11/10 | 02/11 | SS-064   |
| S002031-04   |          | Duplicate (S002031-01) |           | 0.210   | 0.575 |      |       | 78     |     | 119   |      | 7     | 02/11/10 | 02/11 | SS-065   |
| Nominal values and limits from method  |          |                        |           | 1.00    | 0.575 |      |       | 30-110 |     | 100   | 100  |       | 180      |       |          |

PROCEDURES REFERENCE AMCMISO\_IE\_PLATE\_AEA  
CP-062 Sample Aliquoting, rev 2  
CP-963 Americium and Curium in Water and Dissolved Samples by Extraction Chromatography, rev 6  
CP-008 Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD MDA 0.211 ± 0.075  
FOR 4 SAMPLES YIELD 77 ± 11

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLINE  
Protocol CHPRC  
Version Ver 1.0  
Form DVD-LMS  
Version 3.06  
Report date 02/12/10

**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP H4153

Test U Matrix LIQUID  
 SDG 7763  
 Contact N. Joseph Verville

**LAB METHOD SUMMARY**

URANIUM IN LIQUID  
 ALPHA SPECTROSCOPY

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4153

**RESULTS**

| LAB                        | RAW | SUF- | SAMPLE ID | TEST FIX | PLANCHET | CLIENT SAMPLE ID       | 1: Uranium |     |     | 2: Uranium |    |     | 3: Uranium |  |  | RESULT RATIOS (%) |  |  |  |
|----------------------------|-----|------|-----------|----------|----------|------------------------|------------|-----|-----|------------|----|-----|------------|--|--|-------------------|--|--|--|
|                            |     |      |           |          |          |                        | 233/234    | 235 | 238 | 1+3        | 2σ | 2+3 | 2σ         |  |  |                   |  |  |  |
| Preparation batch 7243-084 |     |      |           |          |          |                        |            |     |     |            |    |     |            |  |  |                   |  |  |  |
| S002031-01                 |     |      |           |          |          | B23K14                 | U          |     |     | U          |    |     |            |  |  |                   |  |  |  |
| S002031-02                 |     |      |           |          |          | Lab Control Sample     | ok         |     |     | ok         |    |     |            |  |  |                   |  |  |  |
| S002031-03                 |     |      |           |          |          | Method Blank           | U          |     |     | U          |    |     |            |  |  |                   |  |  |  |
| S002031-04                 |     |      |           |          |          | Duplicate (S002031-01) | -          | U   |     | -          | U  |     |            |  |  |                   |  |  |  |

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

**METHOD PERFORMANCE**

| LAB        | RAW | SUF- | SAMPLE ID | TEST FIX | CLIENT SAMPLE ID | MAX MDA<br>pCi/mL | ALIQ<br>mL | PREP<br>FAC | DILU-<br>TION | YIELD<br>% | EFF<br>% | COUNT<br>min | FWHM<br>keV | DRIFT<br>keV | DAYS<br>HELD | ANAL-<br>YZED | DETECTOR |  |
|------------|-----|------|-----------|----------|------------------|-------------------|------------|-------------|---------------|------------|----------|--------------|-------------|--------------|--------------|---------------|----------|--|
|            |     |      |           |          |                  |                   |            |             |               |            |          |              |             |              |              |               |          | Preparation batch 7243-084 2σ prep error 8.0 % Reference Lab Notebook No. 7243 pg 84 |
| S002031-01 |     |      |           |          |                  | 0.204             | 0.575      |             |               | 87         |          | 110          |             |              | 5            | 02/09/10      | 02/09    | SS-033   |
| S002031-02 |     |      |           |          |                  | 0.799             | 0.470      |             |               | 78         |          | 110          |             |              |              | 02/09/10      | 02/09    | SS-034   |
| S002031-03 |     |      |           |          |                  | 0.284             | 0.470      |             |               | 71         |          | 111          |             |              |              | 02/09/10      | 02/09    | SS-039   |
| S002031-04 |     |      |           |          |                  | 0.200             | 0.575      |             |               | 79         |          | 111          |             |              | 5            | 02/09/10      | 02/09    | SS-040   |

| Nominal values and limits from method | 1.00 | 0.470 | 30-110 | 100 | 180 |
|---------------------------------------|------|-------|--------|-----|-----|
|---------------------------------------|------|-------|--------|-----|-----|

| PROCEDURES | REFERENCE | UIISO_PLATE_AEA   |
|------------|-----------|---|
|            | SPP-040   | Environmental Water Dissolution, rev 2  |
|            | CP-921    | Uranium in Water and Dissolved Samples by<br>Extraction Chromatography, rev 5 |
|            | CP-008    | Heavy Element Electroplating, rev 13  |

|                 |       |                             |
|-----------------|-------|-----------------------------|
| AVERAGES ± 2 SD | MDA   | <u>0.372</u> ± <u>0.575</u> |
| FOR 4 SAMPLES   | YIELD | <u>79</u> ± <u>13</u>       |

METHOD SUMMARIES

Page 4

SUMMARY DATA SECTION

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Lab id EBRLNE  
 Protocol CHPRC  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 02/12/10

**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP H4153

**LAB METHOD SUMMARY**

TOTAL STRONTIUM IN LIQUIDS

BETA COUNTING

Test SR Matrix LIQUID  
 SDG 7763  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4153

**RESULTS**

| LAB                        | RAW  | SUF- |          | Total                  |           |
|----------------------------|------|------|----------|------------------------|-----------|
| SAMPLE ID                  | TEST | FIX  | PLANCHET | CLIENT SAMPLE ID       | Strontium |
| Preparation batch 7243-084 |      |      |          |                        |           |
| S002031-01                 |      |      | 7763-001 | B23K14                 | U         |
| S002031-02                 |      |      | 7763-002 | Lab Control Sample     | ok        |
| S002031-03                 |      |      | 7763-003 | Method Blank           | U         |
| S002031-04                 |      |      | 7763-004 | Duplicate (S002031-01) | - U       |

Nominal values and limits from method      RDLs (pCi/mL)      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/mL | mL    | FAC   | TION | %      | %    | min   | keV  | KeV   | HELD     | PREPARED | YZED | DETECTOR |
| Preparation batch 7243-084      2σ prep error 10.4 %      Reference Lab Notebook No. 7243 pg 84 |      |      |                        |           |        |       |       |      |        |      |       |      |       |          |          |      |          |
| S002031-01  |      |      | B23K14                 |           | 0.243  | 1.12  |       |      | 87     | 100  |       |      | 6     | 02/10/10 | 02/10    |      | GRB-224  |
| S002031-02  |      |      | Lab Control Sample     |           | 0.246  | 1.11  |       |      | 93     | 100  |       |      |       | 02/10/10 | 02/10    |      | GRB-225  |
| S002031-03  |      |      | Method Blank           |           | 0.304  | 1.11  |       |      | 93     | 100  |       |      |       | 02/10/10 | 02/10    |      | GRB-231  |
| S002031-04  |      |      | Duplicate (S002031-01) |           | 0.297  | 1.12  |       |      | 91     | 100  |       |      | 6     | 02/10/10 | 02/10    |      | GRB-232  |
| Nominal values and limits from method   |      |      |                        |           | 1.00   | 1.11  |       |      | 40-110 | 100  |       |      | 180   |          |          |      |          |

PROCEDURES      REFERENCE      SRTOT\_SEP\_PRECIP\_GPC  
 SPP-040      Environmental Water Dissolution, rev 2  
 CP-383      Strontium in Dissolved Solid of < 5.0g Aliquot,  
 rev 4

AVERAGES ± 2 SD      MDA 0.272 ± 0.065  
 FOR 4 SAMPLES      YIELD 91 = 6

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE  
 Protocol CHPRC  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 02/12/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

LAB METHOD SUMMARY

TECHNETIUM-99 IN LIQUID

BETA COUNTING

Test TC Matrix LIQUID

SDG 7763

Contact N. Joseph Verville

Client CHPRC

Contract No. 33677

Contract SDG H4153

RESULTS

LAB RAW SUF- Technetium  
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID 99

Preparation batch 7243-084

|            |          |                        |     |
|------------|----------|------------------------|-----|
| S002031-01 | 7763-001 | B23K14                 | U   |
| S002031-02 | 7763-002 | Lab Control Sample     | ok  |
| S002031-03 | 7763-003 | Method Blank           | U   |
| S002031-04 | 7763-004 | Duplicate (S002031-01) | - U |

Nominal values and limits from method RDLs (pCi/mL) 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/mL | mL   | FAC  | TION  | %     | %   | min   | keV  | KeV   | HELD | PREPARED | YZED | DETECTOR |

Preparation batch 7243-084 2σ prep error 13.2 % Reference Lab Notebook No. 7243 pg 84

|            |                        |       |      |    |     |          |          |         |         |
|------------|------------------------|-------|------|----|-----|----------|----------|---------|---------|
| S002031-01 | B23K14                 | 0.255 | 1.48 | 92 | 100 | 6        | 02/06/10 | 02/10   | GRB-202 |
| S002031-02 | Lab Control Sample     | 0.327 | 1.48 | 72 | 100 | 02/06/10 | 02/10    | GRB-203 |         |
| S002031-03 | Method Blank           | 0.294 | 1.48 | 88 | 100 | 02/06/10 | 02/11    | GRB-201 |         |
| S002031-04 | Duplicate (S002031-01) | 0.251 | 1.48 | 85 | 120 | 5        | 02/06/10 | 02/09   | GRB-222 |

Nominal values and limits from method 15.0 1.48 30-110 100 180

|            |           |   |
|------------|-----------|---|
| PROCEDURES | REFERENCE | TC99_TR_SEP_GPC   |
|            | CP-431    | Technetium-99 Purification of Soil or Resin by Extraction Chromatography, rev 8 |
|            | CP-008    | Heavy Element Electroplating, rev 13  |

|                 |       |               |
|-----------------|-------|---------------|
| AVERAGES ± 2 SD | MDA   | 0.282 ± 0.072 |
| FOR 4 SAMPLES   | YIELD | 84 ± 17       |

METHOD SUMMARIES

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SUMMARY DATA SECTION

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|             |          |
|-------------|----------|
| Lab id      | EBRINE   |
| Protocol    | CHPRC    |
| Version     | Ver 1.0  |
| Form        | DVD-LMS  |
| Version     | 3.06     |
| Report date | 02/12/10 |

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

LAB METHOD SUMMARY

GROSS ALPHA IN LIQUID  
GAS PROPORTIONAL COUNTING

Test 93A Matrix LIQUID  
SDG 7763  
Contact N. Joseph Verville

Client CHPRC  
Contract No. 33677  
Contract SDG H4153

RESULTS

| LAB                        | RAW      | SUF-     |                        |           | Gross Alpha |
|----------------------------|----------|----------|------------------------|-----------|-------------|
| SAMPLE ID                  | TEST FIX | PLANCHET | CLIENT                 | SAMPLE ID |             |
| Preparation batch 7243-084 |          |          |                        |           |             |
| S002031-01                 | 93       | 7763-001 | B23K14                 |           | U           |
| S002031-02                 | 93       | 7763-002 | Lab Control Sample     |           | ok          |
| S002031-03                 | 93       | 7763-003 | Method Blank           |           | U           |
| S002031-04                 | 93       | 7763-004 | Duplicate (S002031-01) |           | - U         |

Nominal values and limits from method RDLs (pCi/mL) 10.0

METHOD PERFORMANCE

| LAB   | RAW      | SUF-                   | MDA       | ALIQ   | PREP  | DILU- | RESID | EFF | COUNT | FWHM | DRIFT | DAYS | ANAL- |          |       |          |
|---|----------|------------------------|-----------|--------|-------|-------|-------|-----|-------|------|-------|------|-------|----------|-------|----------|
| SAMPLE ID   | TEST FIX | CLIENT                 | SAMPLE ID | pCi/mL | mL    | FAC   | TION  | mg  | %     | min  | keV   | KeV  | HELD  | PREPARED | YZED  | DETECTOR |
| Preparation batch 7243-084 2σ prep error 20.6 % Reference Lab Notebook No. 7243 pg 84 |          |                        |           |        |       |       |       |     |       |      |       |      |       |          |       |          |
| S002031-01  | 93       | B23K14                 |           | 1.76   | 0.112 |       |       | 4   |       | 100  |       |      | 5     | 02/09/10 | 02/09 | GRB-101  |
| S002031-02  | 93       | Lab Control Sample     |           | 3.38   | 0.110 |       |       | 65  |       | 100  |       |      |       | 02/09/10 | 02/09 | GRB-103  |
| S002031-03  | 93       | Method Blank           |           | 3.80   | 0.110 |       |       | 66  |       | 100  |       |      |       | 02/09/10 | 02/09 | GRB-104  |
| S002031-04  | 93       | Duplicate (S002031-01) |           | 1.70   | 0.112 |       |       | 4   |       | 100  |       |      | 5     | 02/09/10 | 02/09 | GRB-105  |

Nominal values and limits from method 10.0 0.110 5-250 100 180

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
SPP-040 Environmental Water Dissolution, rev 2  
SPP-120 Gross Alpha and Gross Beta in Water, rev 3

AVERAGES + 2 SD MDA 2.66 = 2.18  
FOR 4 SAMPLES RESIDUE 35 = 71

METHOD SUMMARTES

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SUMMARY DATA SECTION

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Lab id EBRLNE  
Protocol CHPRC  
Version Ver 1.0  
Form DVD-LMS  
Version 3.06  
Report date 02/12/10

**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP H4153

**LAB METHOD SUMMARY**

GROSS BETA IN LIQUID

GAS PROPORTIONAL COUNTING

Test 93B Matrix LIQUID  
 SDG 7763  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4153

**RESULTS**

LAB RAW SUF-  
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Gross Beta

Preparation batch 7243-084

|            |    |          |                        |      |
|------------|----|----------|------------------------|------|
| S002031-01 | 93 | 7763-001 | B23K14                 | 19.0 |
| S002031-02 | 93 | 7763-002 | Lab Control Sample     | ok   |
| S002031-03 | 93 | 7763-003 | Method Blank           | U    |
| S002031-04 | 93 | 7763-004 | Duplicate (S002031-01) | ok   |

Nominal values and limits from method RDI.s (pCi/mL) 15.0

**METHOD PERFORMANCE**

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

Preparation batch 7243-084 2σ prep error 11.0 % Reference Lab Notebook No. 7243 pg 84

|            |    |                        |      |       |    |     |   |          |       |         |
|------------|----|------------------------|------|-------|----|-----|---|----------|-------|---------|
| S002031-01 | 93 | B23K14                 | 4.38 | 0.112 | 4  | 100 | 5 | 02/09/10 | 02/09 | GRB-101 |
| S002031-02 | 93 | Lab Control Sample     | 5.86 | 0.110 | 65 | 100 |   | 02/09/10 | 02/09 | GRB-103 |
| S002031-03 | 93 | Method Blank           | 4.52 | 0.110 | 66 | 100 |   | 02/09/10 | 02/09 | GRB-104 |
| S002031-04 | 93 | Duplicate (S002031-01) | 4.78 | 0.112 | 4  | 100 | 5 | 02/09/10 | 02/09 | GRB-105 |

Nominal values and limits from method 15.0 0.110 5-250 100 180

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
 SPP-040 Environmental Water Dissolution, rev 2  
 SPP-120 Gross Alpha and Gross Beta in Water, rev 3

AVERAGES ± 2 SD MDA 4.88 ± 1.34  
 FOR 4 SAMPLES RESIDUE 35 ± 71

METHOD SUMMARIES

Page 8

SUMMARY DATA SECTION

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Lab id EBRLNE  
 Protocol CHPRC  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 02/12/10



EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

LAB METHOD SUMMARY

TRITIUM IN LIQUID

LIQUID SCINTILLATION COUNTING

Test H      Matrix LIQUID  
 SDG 7763  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4153

RESULTS

| LAB                        | RAW      | SUF-     |                        |  |         |
|----------------------------|----------|----------|------------------------|--|---------|
| SAMPLE ID                  | TEST FIX | PLANCHET | CLIENT SAMPLE ID       |  | Tritium |
| Preparation batch 7243-084 |          |          |                        |  |         |
| S002031-01                 |          | 7763-001 | B23K14                 |  | U       |
| S002031-02                 |          | 7763-002 | Lab Control Sample     |  | ok      |
| S002031-03                 |          | 7763-003 | Method Blank           |  | U       |
| S002031-04                 |          | 7763-004 | Duplicate (S002031-01) |  | - U     |

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

METHOD PERFORMANCE

| LAB   | RAW      | SUF-                   | MDA    | ALIQ   | PREP | DILU- | YIELD | EFF | COUNT | FWHM | DRIFT | DAYS | ANAL-    |       |          |
|---|----------|------------------------|--------|--------|------|-------|-------|-----|-------|------|-------|------|----------|-------|----------|
| SAMPLE ID   | TEST FIX | CLIENT SAMPLE ID       | pCi/mL | mL     | FAC  | TION  | %     | %   | min   | keV  | KeV   | HELD | PREPARED | YZED  | DETECTOR |
| Preparation batch 7243-084 2σ prep error 10.0 % Reference Lab Notebook No. 7243 pg 84 |          |                        |        |        |      |       |       |     |       |      |       |      |          |       |          |
| S002031-01  |          | B23K14                 | 77.1   | 0.0216 |      |       | 100   |     | 50    |      |       | 4    | 02/08/10 | 02/08 | LSC-004  |
| S002031-02  |          | Lab Control Sample     | 82.0   | 0.0200 |      |       | 100   |     | 50    |      |       |      | 02/08/10 | 02/08 | LSC-004  |
| S002031-03  |          | Method Blank           | 84.6   | 0.0200 |      |       | 100   |     | 50    |      |       |      | 02/08/10 | 02/08 | LSC-004  |
| S002031-04  |          | Duplicate (S002031-01) | 79.2   | 0.0210 |      |       | 100   |     | 50    |      |       | 4    | 02/08/10 | 02/08 | LSC-004  |

Nominal values and limits from method 400 0.0200 5 180

PROCEDURES REFERENCE TRITIUM\_COX\_LSC  
 CP 251 Tritium/Carbon-14 Oxidation, rev 11

AVERAGES ± 2 SD MDA 80.7 ± 6.54  
 FOR 4 SAMPLES YIELD 100 ± 0

METHOD SUMMARIES

Page 10

SUMMARY DATA SECTION

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Lab id EBRLINE  
 Protocol CHPRC  
 Version Ver 1.0  
 Form DVD LMS  
 Version 3.06  
 Report date 02/12/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4153

LAB METHOD SUMMARY

NICKEL-63 IN LIQUID

LIQUID SCINTILLATION COUNTING

Test NI L Matrix LIQUID  
 SDG 7763  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4153

RESULTS

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

Preparation batch 7243-084

|            |          |                        |    |
|------------|----------|------------------------|----|
| S002031-01 | 7763-001 | B23K14                 | U  |
| S002031-02 | 7763-002 | Lab Control Sample     | ok |
| S002031-03 | 7763-003 | Method Blank           | U  |
| S002031-04 | 7763-004 | Duplicate (S002031-01) | U  |

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

METHOD PERFORMANCE

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

Preparation batch 7243-084 2σ prep error 11.2 % Reference Lab Notebook No. 7243 pg 84

|            |                        |      |       |    |    |   |          |       |         |
|------------|------------------------|------|-------|----|----|---|----------|-------|---------|
| S002031-01 | B23K14                 | 2.19 | 0.575 | 99 | 50 | 5 | 02/09/10 | 02/09 | LSC-005 |
| S002031-02 | Lab Control Sample     | 2.53 | 0.500 | 98 | 50 |   | 02/09/10 | 02/09 | LSC-005 |
| S002031-03 | Method Blank           | 2.53 | 0.500 | 98 | 50 |   | 02/09/10 | 02/09 | LSC-005 |
| S002031-04 | Duplicate (S002031-01) | 2.19 | 0.575 | 98 | 50 | 5 | 02/09/10 | 02/09 | LSC-005 |

Nominal values and limits from method 30.0 0.500 40-110 10 180

PROCEDURES REFERENCE NI63\_LSC  
 SPP-062 Sample Aliquoting, rev 1  
 CP-280 Nickel-63 Purification, rev 5

AVERAGES ± 2 SD MDA 2.36 ± 0.393  
 FOR 4 SAMPLES YIELD 98 ± 1

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNR  
 Protocol CHPRC  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 02/12/10

**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP H4153

Test PU L Matrix LIQUID  
 SDG 7763  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4153

**LAB METHOD SUMMARY**

PLUTONIUM 241 IN LIQUIDS  
 LIQUID SCINTILLATION COUNTING

**RESULTS**

|                  |                 |                 |                         |                  |
|------------------|-----------------|-----------------|-------------------------|------------------|
| <b>LAB</b>       | <b>RAW</b>      | <b>SUF-</b>     |                         | <b>Plutonium</b> |
| <b>SAMPLE ID</b> | <b>TEST FIX</b> | <b>PLANCHET</b> | <b>CLIENT SAMPLE ID</b> | <b>241</b>       |

Preparation batch 7243-084

|            |          |                        |  |     |
|------------|----------|------------------------|--|-----|
| S002031-01 | 7763-001 | B23K14                 |  | U   |
| S002031-02 | 7763-002 | Lab Control Sample     |  | ok  |
| S002031-03 | 7763-003 | Method Blank           |  | U   |
| S002031-04 | 7763-004 | Duplicate (S002031-01) |  | - U |

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

**METHOD PERFORMANCE**

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

Preparation batch 7243-084      2σ prep error 12.4 %      Reference Lab Notebook No. 7243 pg 84

|            |                        |  |             |       |  |  |  |    |  |    |  |  |   |          |       |         |
|------------|------------------------|--|-------------|-------|--|--|--|----|--|----|--|--|---|----------|-------|---------|
| S002031-01 | B23K14                 |  | <u>19.1</u> | 0.575 |  |  |  | 36 |  | 50 |  |  | 6 | 02/10/10 | 02/10 | LSC-004 |
| S002031-02 | Lab Control Sample     |  | <u>18.2</u> | 0.575 |  |  |  | 37 |  | 50 |  |  |   | 02/10/10 | 02/10 | LSC-004 |
| S002031-03 | Method Blank           |  | <u>16.9</u> | 0.575 |  |  |  | 40 |  | 50 |  |  |   | 02/10/10 | 02/10 | LSC-004 |
| S002031-04 | Duplicate (S002031-01) |  | <u>20.0</u> | 0.575 |  |  |  | 34 |  | 50 |  |  | 6 | 02/10/10 | 02/10 | LSC-004 |

Nominal values and limits from method      15.0      0.575      30-110      50      180

|                   |   |                     |
|-------------------|---|---------------------|
| <b>PROCEDURES</b> | <b>REFERENCE</b>  | <b>PU241_IE_LSC</b> |
| SPP-071           | 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                         |                     |

|                        |              |             |          |             |
|------------------------|--------------|-------------|----------|-------------|
| <b>AVERAGES ± 2 SD</b> | <b>MDA</b>   | <u>18.6</u> | <b>±</b> | <u>2.65</u> |
| <b>FOR 4 SAMPLES</b>   | <b>YIELD</b> | <u>37</u>   | <b>±</b> | <u>5</u>    |

**METHOD SUMMARIES**

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**SUMMARY DATA SECTION**

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|             |                 |
|-------------|-----------------|
| Lab id      | <u>EBRLNE</u>   |
| Protocol    | <u>CHPRC</u>    |
| Version     | <u>Ver 1.0</u>  |
| Form        | <u>DVD-LMS</u>  |
| Version     | <u>3.06</u>     |
| Report date | <u>02/12/10</u> |

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4153

SDG 7763  
 Contact N. Joseph Verville

R E P O R T G U I D E

Client CHPRC  
 Contract No. 33677  
 Case no SDG\_H4153

S A M P L E S U M M A R Y

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 CHPRC  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/12/10

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4153

SDG 7763  
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC  
 Contract No. 33677  
 Case no SDG\_H4153

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE  
 Protocol CHPRC  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/12/10

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4153

SDG 7763  
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC  
 Contract No. 33677  
 Case no SDG H4153

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.

REPORT GUIDES

Page 3

SUMMARY DATA SECTION

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Lab id EBRLNE  
 Protocol CHPRC  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/12/10

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4153

SDG 7763  
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC  
 Contract No. 33677  
 Case no SDG H4153

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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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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- \* 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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METHOD SUMMARY

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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| CHAIN OF CUSTODY / SAMPLE ANALYSIS REQUEST   |  | PAGE 1 OF 1  |
| <b>COLLECTOR</b><br>CH2M Hill Plateau Remediation Company<br>AL McIntyre   | <b>COMPANY CONTACT</b><br>WIDRIG, DL<br>H4153  | <b>F10-021-025</b><br>PRICE CODE 9B<br>AIR QUALITY <input type="checkbox"/>  |
| <b>SAMPLING LOCATION</b><br>Upper & Lower Ale Build; Kitchen<br>605-121  | <b>TELEPHONE NO.</b><br>376-2858 (7763)  | <b>DATA TURNAROUND</b><br>7 Days / 15 Days   |
| <b>ICE CHEST NO.</b><br>605-121  | <b>PROJECT DESIGNATION</b><br>ARRA Upper & Lower Ale Building Science Laboratory - Other Liquids | <b>METHOD OF SHIPMENT</b><br>GOVERNMENT VEHICLE  |
| <b>SHIPPED TO</b><br>Ebeeline<br>Waste Sampling & Characterization   | <b>FIELD LOGBOOK NO.</b><br>HNF-N-507-8  | <b>COA</b><br>302228ES10   |
| <b>MATRIX*</b><br>A=Air<br>DL=Drum<br>L=Liquid<br>DS=Drum<br>S=Soil<br>SE=Sediment<br>T=Tissue<br>V=Vegetation<br>W=Water<br>WI=Wipe<br>X=Other  | <b>OFFSITE PROPERTY NO.</b><br>HNF-N-507-8<br>HNF-N-2410 00727                                   | <b>BILL OF LADING/AIR BILL NO.</b><br>HNF-N-2410 7883 6540 5780  |
| <b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b><br>Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993) | <b>PRESERVATION</b><br>None  | None   |
| <b>SPECIAL HANDLING AND/OR STORAGE</b>   | <b>TYPE OF CONTAINER</b><br>P  | G/P  |
| <b>SAMPLE NO.</b><br>B23K14  | <b>NO. OF CONTAINER(S)</b><br>1  | 1  |
| <b>MATRIX*</b><br>OTHER LIQUID   | <b>VOLUME</b><br>60ml  | 500ml  |
| <b>SPECIAL HANDLING AND/OR STORAGE</b>   | <b>SAMPLE ANALYSIS</b>   | pH (Soil) - 9045; SEE ITEM (1) IN SPECIAL INSTRUCTIONS   |
| <b>CHAIN OF POSSESSION</b>   | <b>SIGN/ PRINT NAMES</b>   | <b>SPECIAL INSTRUCTIONS</b>  |
| RELINQUISHED BY/REMOVED FROM<br>AR McIntyre  | RECEIVED BY/STORED IN<br>Fed Ex  | ** The CACN for all analytical work at WSCF laboratory is 401587.  |
| DATE/TIME<br>3/4/10 1400   | DATE/TIME<br>03/05/10 0915   | ** The analyses are listed on the SAF in the order that they should be performed. If you have questions, contact the SMR Project Coordinator.  |
| RELINQUISHED BY/REMOVED FROM<br>Fed Ex   | RECEIVED BY/STORED IN<br>HNF-N-2410 00727  | (1) Gamma Spectroscopy {Europium-152, Cesium-137, Europium-154, Europium-152, Cobalt-60} Gamma Spec - Add-on {Americium-241, Radium-228, Sodium-22} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238} Strontium-89,90 -- Total Sr; Technetium-99; Americium-241/Curium-244 {Curium-244} Plutonium-244; C.J.H. 1-18-10 |
| DATE/TIME<br>3/4/10 1400   | DATE/TIME<br>03/05/10 0915   | {Plutonium-244} Tritium - H3 {Tritium} RADISO_ICPMS {Thorium-232}  |
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| DATE/TIME<br>3/4/10 1400   | DATE/TIME<br>03/05/10 0915   | DATE/TIME  |
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| DATE/TIME<br>3/4/10 1400   | DATE/TIME<br>03/05/10 0915   | DATE/TIME  |
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|  |  |  |

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-021-026 PAGE 1 OF 1

PRICE CODE 9B DATA TURNAROUND 7 Days / 15 Days

PROJECT COORDINATOR WIDRIG, DL  
 SAF NO. F10-021  
 COA 302228E510  
 METHOD OF SHIPMENT FEDERAL EXPRESS

BILL OF LADING/AIR BILL NO. SEPT 24 240 7983 6540 5740

COMPANY CONTACT 44153  
 TELEPHONE NO. 376-2858 (7763)  
 PROJECT DESIGNATION ARRA Upper & Lower ALE Building Science Laboratory - Other Liquids  
 ACTUAL SAMPLE DEPTH  
 FIELD LOGBOOK NO. HNF-N-507-8  
 OFFSITE PROPERTY NO. SEE PTR 2-4-10 00727

PRESERVATION None  
 TYPE OF CONTAINER G/P  
 NO. OF CONTAINER(S) 1  
 VOLUME 125ml  
 SAMPLE ANALYSIS Nickel-63

POSSIBLE SAMPLE HAZARDS/ REMARKS  
 Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

SAMPLE NO. B23K14 MATRIX\* OTHER LIQUID

SIGN/ PRINT NAMES

| RELINQUISHED BY/REMOVED FROM | DATE/TIME   | RECEIVED BY/STORED IN | DATE/TIME |
|------------------------------|-------------|-----------------------|-----------|
| AR McIntyre                  | 2/4/10 1400 | Fed Ex                |           |
|                              |             | RECEIVED BY/STORED IN | DATE/TIME |
|                              |             | RECEIVED BY/STORED IN | DATE/TIME |
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|                              |             | RECEIVED BY/STORED IN | DATE/TIME |
|                              |             | RECEIVED BY/STORED IN | DATE/TIME |

SPECIAL INSTRUCTIONS  
 \*\* Ni-63 analyses shall be performed with minimum QC to meet RDLs as previously agreed.

LABORATORY SECTION RECEIVED BY  
 FINAL SAMPLE DISPOSITION DISPOSAL METHOD



# RICHMOND, CA LABORATORY

## SAMPLE RECEIPT CHECKLIST

Client: CHPRC City RICHMOND State WA  
 Date/Time received 07/05/10 0915 CoC No. F10-021-025, 026  
 Container I.D. No. GWS-121 Requested TAT (Days) 2/15 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 []
6. Number of samples in shipping container: 1 Sample Matrix X LIQUID
7. Number of containers per sample: 2 (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 N/A Preservative \_\_\_\_\_
13. Describe any anomalies:  
\_\_\_\_\_  
\_\_\_\_\_
14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date \_\_\_\_\_
15. Inspected by [Signature] Date: 07/05/10 Time: 1230

| Customer Sample No. | Beta/Gamma cpm | Ion Chamber mR/hr | Wipe | Customer Sample No. | Beta/Gamma cpm | Ion Chamber mR/hr | wipe |
|---------------------|----------------|-------------------|------|---------------------|----------------|-------------------|------|
| <u>B23K1A</u>       | <u>660</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 05 AUG 09