



**EBERLINE**  
SERVICES

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EBERLINE ANALYTICAL CORPORATION  
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February 12, 2010

0089329

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 S0-02-030-7762, SDG H4152

Dear Mr. Neely:

Enclosed is a data report for one water sample designated under SAF No. F10-023 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/jjb

Enclosure: Case Narrative

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## 1.0 GENERAL

CH2M Hill Plateau Remediation Company (CHPRC) Sample Delivery Group H4152 was composed of one water sample designated under SAF No. F10-023 with a Project Designation of: ARRA Upper & Lower ALE Building Science Laboratory – QC.

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

Per the request of CHPRC (Dana Widrig), Eberline Analytical performed all the rad analyses listed in SAF F10-023.

## 2.0 ANALYSIS NOTES

### 2.1 Gross Alpha and Gross Beta 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.

### 2.2 Tritium Analysis

The tritium QC MS analysis data sheet denotes an "X" qualifier, which indicates that some data was manually entered and may need to be double checked; in this case the "added amount" was manually entered, and subsequently double checked. 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**

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.

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

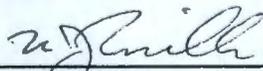
The results for both the original and duplicate analyses were less than their respective MDA's, therefore no RPD is calculated, and there is no associated control limit. No problems were encountered during the course of the analyses.

**2.10 Gamma Spectroscopy**

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.

**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 H4152

SDG 7762  
Contact N. Joseph Verville

Client CHPRC  
Contract No. 33677  
Case no SDG H4152

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

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Prepared by \_\_\_\_\_

Reviewed by *N. Joseph Verville*

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

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4152

SDG 7762  
Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC  
Contract No. 33677  
Case no SDG H4152

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 H4152

SDG 7762  
Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC  
Contract No. 33677  
Case no SDG H4152

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

Page 2

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 H4152

**LAB SAMPLE SUMMARY**

SDG 7762  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Case no SDG H4152

| LAB<br>SAMPLE ID | CLIENT SAMPLE ID       | LOCATION | MATRIX | LEVEL | SAF NO  | CHAIN OF<br>CUSTODY | COLLECTED      |
|------------------|------------------------|----------|--------|-------|---------|---------------------|----------------|
| S002030-01       | B23K51                 | FT8      | WATER  |       | F10-023 | F10-023-002         | 02/04/10 08:00 |
| S002030-02       | Lab Control Sample     |          | WATER  |       | F10-023 |                     |                |
| S002030-03       | Method Blank           |          | WATER  |       | F10-023 |                     |                |
| S002030-04       | Duplicate (S002030-01) | FT8      | WATER  |       | F10-023 |                     | 02/04/10 08:00 |
| S002030-05       | Spike (S002030-01)     | FT8      | WATER  |       | F10-023 |                     | 02/04/10 08:00 |
| S002030-06       | Lab Control Sample     |          | WATER  |       | F10-023 |                     |                |
| S002030-07       | Method Blank           |          | WATER  |       | F10-023 |                     |                |
| S002030-08       | Duplicate (S002030-01) | FT8      | WATER  |       | F10-023 |                     | 02/04/10 08:00 |

LAB SUMMARY

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SUMMARY DATA SECTION

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

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4152

SDG 7762  
 Contact N. Joseph Verville

QC SUMMARY

Client CHPRC  
 Contract No. 33677  
 Case no SDG H4152

| QC BATCH | CHAIN OF CUSTODY | CLIENT SAMPLE ID       | MATRIX | SOLIDS | SAMPLE AMOUNT | BASIS AMOUNT | DAYS SINCE RECEIVED | LAB COLL | LAB SAMPLE ID | DEPARTMENT SAMPLE ID |
|----------|------------------|------------------------|--------|--------|---------------|--------------|---------------------|----------|---------------|----------------------|
| 7762     | F10-023-002      | B23K51                 | WATER  |        | 6.0 L         |              | 02/05/10            | 1        | S002030-01    | 7762-001             |
|          |                  | Method Blank           | WATER  |        |               |              |                     |          | S002030-03    | 7762-003             |
|          |                  | Method Blank           | WATER  |        |               |              |                     |          | S002030-07    | 7762-007             |
|          |                  | Lab Control Sample     | WATER  |        |               |              |                     |          | S002030-02    | 7762-002             |
|          |                  | Lab Control Sample     | WATER  |        |               |              |                     |          | S002030-06    | 7762-006             |
|          |                  | Duplicate (S002030-01) | WATER  |        | 6.0 L         |              | 02/05/10            | 1        | S002030-04    | 7762-004             |
|          |                  | Duplicate (S002030-01) | WATER  |        | 6.0 L         |              | 02/05/10            | 1        | S002030-08    | 7762-008             |
|          |                  | Spike (S002030-01)     | WATER  |        | 6.0 L         |              | 02/05/10            | 1        | S002030-05    | 7762-005             |

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 Protocol CHPRC  
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 Version 3.06  
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**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP H4152

SDG 7762  
Contact N. Joseph Verville

**PREP BATCH SUMMARY**

Client CHPRC  
Contract No. 33677  
Case no SDG H4152

| TEST                                 | MATRIX | METHOD                       | PREPARATION ERROR |      | PLANCHETS ANALYZED |      |    |       | QUALI- |           |
|--------------------------------------|--------|------------------------------|-------------------|------|--------------------|------|----|-------|--------|-----------|
|                                      |        |                              | BATCH             | 2σ % | CLIENT             | MORE | RE | BLANK |        | LCS       |
| <b>Alpha Spectroscopy</b>            |        |                              |                   |      |                    |      |    |       |        |           |
| PU                                   | WATER  | Plutonium, Isotopic in Water | 7240-143          | 8.0  | 1                  |      |    | 1     | 1      | 1/1       |
| TH                                   | WATER  | Thorium, Isotopic in Water   | 7240-143          | 8.0  | 1                  |      |    | 1     | 1      | 1/1       |
| TP                                   | WATER  | Americium 241/Curium         | 7240-143          | 8.0  | 1                  |      |    | 1     | 1      | 1/1       |
| U                                    | WATER  | Uranium, Isotopic in Water   | 7240-143          | 8.0  | 1                  |      |    | 1     | 1      | 1/1       |
| <b>Beta Counting</b>                 |        |                              |                   |      |                    |      |    |       |        |           |
| SR                                   | WATER  | Total Strontium in Water     | 7240-143          | 10.4 | 1                  |      |    | 1     | 1      | 1/1       |
| TC                                   | WATER  | Technetium 99 in Water       | 7240-143          | 13.2 | 1                  |      |    | 1     | 1      | 1/1       |
| <b>Gas Proportional Counting</b>     |        |                              |                   |      |                    |      |    |       |        |           |
| 93A                                  | WATER  | Gross Alpha in Water         | 7240-143          | 20.6 | 1                  |      |    | 1     | 1      | 1/1       |
| 93B                                  | WATER  | Gross Beta in Water          | 7240-143          | 11.0 | 1                  |      |    | 1     | 1      | 1/1       |
| <b>Gamma Spectroscopy</b>            |        |                              |                   |      |                    |      |    |       |        |           |
| GAM                                  | WATER  | Gamma Emitters               | 7240-143          | 7.0  | 1                  |      |    | 1     | 1      | 1/1       |
| <b>Liquid Scintillation Counting</b> |        |                              |                   |      |                    |      |    |       |        |           |
| H                                    | WATER  | Tritium in Water             | 7240-143          | 10.0 | 1                  |      |    | 1     | 1      | 1/1 1/1 X |
| NI_L                                 | WATER  | Nickel-63 in Liquid          | 7240-143          | 11.2 | 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 EBRLNE  
Protocol CHPRC  
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Form DVD-PBS  
Version 3.06  
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**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP H4152

**LAB WORK SUMMARY**

SDG 7762  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Case no SDG H4152

| LAB SAMPLE | CLIENT SAMPLE ID       |         |          |        |     |          |          |     |                              |  |  |
|------------|------------------------|---------|----------|--------|-----|----------|----------|-----|------------------------------|--|--|
| COLLECTED  | LOCATION               | MATRIX  | SUF-     |        |     |          |          |     |                              |  |  |
| RECEIVED   | CUSTODY                | SAF No  | PLANCHET | TEST   | FIX | ANALYZED | REVIEWED | BY  | METHOD                       |  |  |
| S002030-01 | B23K51                 |         | 7762-001 | 93A/93 |     | 02/09/10 | 02/11/10 | BW  | Gross Alpha in Water         |  |  |
| 02/04/10   | FT8                    |         | 7762-001 | 93B/93 |     | 02/09/10 | 02/11/10 | BW  | Gross Beta in Water          |  |  |
| 02/05/10   | F10-023-002            | F10-023 | 7762-001 | GAM    |     | 02/08/10 | 02/11/10 | CSS | Gamma Emitters               |  |  |
|            |                        |         | 7762-001 | H      |     | 02/08/10 | 02/11/10 | BW  | Tritium in Water             |  |  |
|            |                        |         | 7762-001 | NI_L   |     | 02/10/10 | 02/11/10 | BW  | Nickel-63 in Liquid          |  |  |
|            |                        |         | 7762-001 | PU     |     | 02/11/10 | 02/11/10 | BW  | Plutonium, Isotopic in Water |  |  |
|            |                        |         | 7762-001 | SR     |     | 02/10/10 | 02/12/10 | BW  | Total Strontium in Water     |  |  |
|            |                        |         | 7762-001 | TC     |     | 02/09/10 | 02/11/10 | BW  | Technetium 99 in Water       |  |  |
|            |                        |         | 7762-001 | TH     |     | 02/11/10 | 02/11/10 | BW  | Thorium, Isotopic in Water   |  |  |
|            |                        |         | 7762-001 | TP     |     | 02/11/10 | 02/12/10 | BW  | Americium 241/Curium         |  |  |
|            |                        |         | 7762-001 | U      |     | 02/10/10 | 02/11/10 | BW  | Uranium, Isotopic in Water   |  |  |
| S002030-02 | Lab Control Sample     |         | 7762-002 | 93A/93 |     | 02/09/10 | 02/11/10 | BW  | Gross Alpha in Water         |  |  |
|            |                        |         | 7762-002 | 93B/93 |     | 02/09/10 | 02/11/10 | BW  | Gross Beta in Water          |  |  |
|            |                        | F10-023 | 7762-002 | GAM    |     | 02/08/10 | 02/11/10 | CSS | Gamma Emitters               |  |  |
|            |                        |         | 7762-002 | H      |     | 02/08/10 | 02/11/10 | BW  | Tritium in Water             |  |  |
|            |                        |         | 7762-002 | NI_L   |     | 02/10/10 | 02/11/10 | BW  | Nickel-63 in Liquid          |  |  |
|            |                        |         | 7762-002 | TC     |     | 02/09/10 | 02/11/10 | BW  | Technetium 99 in Water       |  |  |
|            |                        |         | 7762-002 | TP     |     | 02/11/10 | 02/12/10 | BW  | Americium 241/Curium         |  |  |
|            |                        |         | 7762-002 | U      |     | 02/10/10 | 02/11/10 | BW  | Uranium, Isotopic in Water   |  |  |
| S002030-03 | Method Blank           |         | 7762-003 | 93A/93 |     | 02/10/10 | 02/11/10 | BW  | Gross Alpha in Water         |  |  |
|            |                        |         | 7762-003 | 93B/93 |     | 02/10/10 | 02/11/10 | BW  | Gross Beta in Water          |  |  |
|            |                        | F10-023 | 7762-003 | GAM    |     | 02/08/10 | 02/11/10 | CSS | Gamma Emitters               |  |  |
|            |                        |         | 7762-003 | H      |     | 02/08/10 | 02/11/10 | BW  | Tritium in Water             |  |  |
|            |                        |         | 7762-003 | NI_L   |     | 02/10/10 | 02/11/10 | BW  | Nickel-63 in Liquid          |  |  |
|            |                        |         | 7762-003 | TC     |     | 02/10/10 | 02/11/10 | BW  | Technetium 99 in Water       |  |  |
|            |                        |         | 7762-003 | TP     |     | 02/11/10 | 02/12/10 | BW  | Americium 241/Curium         |  |  |
|            |                        |         | 7762-003 | U      |     | 02/10/10 | 02/11/10 | BW  | Uranium, Isotopic in Water   |  |  |
| S002030-04 | Duplicate (S002030-01) |         | 7762-004 | 93A/93 |     | 02/09/10 | 02/11/10 | BW  | Gross Alpha in Water         |  |  |
| 02/04/10   | FT8                    |         | 7762-004 | 93B/93 |     | 02/09/10 | 02/11/10 | BW  | Gross Beta in Water          |  |  |
| 02/05/10   |                        | F10-023 | 7762-004 | GAM    |     | 02/10/10 | 02/11/10 | CSS | Gamma Emitters               |  |  |
|            |                        |         | 7762-004 | H      |     | 02/08/10 | 02/11/10 | BW  | Tritium in Water             |  |  |
|            |                        |         | 7762-004 | NI_L   |     | 02/10/10 | 02/11/10 | BW  | Nickel-63 in Liquid          |  |  |
|            |                        |         | 7762-004 | TC     |     | 02/09/10 | 02/11/10 | BW  | Technetium 99 in Water       |  |  |
|            |                        |         | 7762-004 | TP     |     | 02/11/10 | 02/12/10 | BW  | Americium 241/Curium         |  |  |
|            |                        |         | 7762-004 | U      |     | 02/10/10 | 02/11/10 | BW  | Uranium, Isotopic in Water   |  |  |

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 H4152

**WORK SUMMARY, cont.**

SDG 7762  
Contact N. Joseph Verville

Client CHPRC  
Contract No. 33677  
Case no SDG H4152

| LAB SAMPLE | CLIENT SAMPLE ID       | COLLECTED | LOCATION | MATRIX | SUF- | RECEIVED | CUSTODY | SAF No  | PLANCHET | TEST | FLX | ANALYZED | REVIEWED | BY | METHOD                       |
|------------|------------------------|-----------|----------|--------|------|----------|---------|---------|----------|------|-----|----------|----------|----|------------------------------|
| S002030-05 | Spike (S002030-01)     |           |          |        |      |          |         |         | 7762-005 | H    |     | 02/08/10 | 02/11/10 | BW | Tritium in Water             |
|            |                        | 02/04/10  | FT8      | WATER  |      |          |         |         |          |      |     |          |          |    |                              |
|            |                        | 02/05/10  |          |        |      |          |         | F10-023 |          |      |     |          |          |    |                              |
| S002030-06 | Lab Control Sample     |           |          |        |      |          |         |         | 7762-006 | PU   |     | 02/11/10 | 02/11/10 | BW | Plutonium, Isotopic in Water |
|            |                        |           |          | WATER  |      |          |         |         | 7762-006 | SR   |     | 02/10/10 | 02/12/10 | BW | Total Strontium in Water     |
|            |                        |           |          |        |      |          |         | F10-023 | 7762-006 | TH   |     | 02/11/10 | 02/11/10 | BW | Thorium, Isotopic in Water   |
| S002030-07 | Method Blank           |           |          |        |      |          |         |         | 7762-007 | PU   |     | 02/11/10 | 02/11/10 | BW | Plutonium, Isotopic in Water |
|            |                        |           |          | WATER  |      |          |         |         | 7762-007 | SR   |     | 02/10/10 | 02/12/10 | BW | Total Strontium in Water     |
|            |                        |           |          |        |      |          |         | F10-023 | 7762-007 | TH   |     | 02/11/10 | 02/11/10 | BW | Thorium, Isotopic in Water   |
| S002030-08 | Duplicate (S002030-01) |           |          |        |      |          |         |         | 7762-008 | PU   |     | 02/11/10 | 02/11/10 | BW | Plutonium, Isotopic in Water |
|            |                        | 02/04/10  | FT8      | WATER  |      |          |         |         | 7762-008 | SR   |     | 02/10/10 | 02/12/10 | BW | Total Strontium in Water     |
|            |                        | 02/05/10  |          |        |      |          |         | F10-023 | 7762-008 | TH   |     | 02/11/10 | 02/11/10 | BW | Thorium, Isotopic in Water   |

**COUNTS OF TESTS BY SAMPLE TYPE**

| TEST          | SAF No  | METHOD                       | REFERENCE            | CLIENT    | MORE | RE | BLANK     | LCS       | DUP       | SPIKE    | TOTAL     |
|---------------|---------|------------------------------|----------------------|-----------|------|----|-----------|-----------|-----------|----------|-----------|
| 93A/93        | F10-023 | Gross Alpha in Water         | 900.0_ALPHABETA_GPC  | 1         |      |    | 1         | 1         | 1         |          | 4         |
| 93B/93        | F10-023 | Gross Beta in Water          | 900.0_ALPHABETA_GPC  | 1         |      |    | 1         | 1         | 1         |          | 4         |
| GAM           | F10-023 | Gamma Emitters               | GAMMA_GS             | 1         |      |    | 1         | 1         | 1         |          | 4         |
| H             | F10-023 | Tritium in Water             | 906.0_H3_LSC         | 1         |      |    | 1         | 1         | 1         | 1        | 5         |
| NI_L          | F10-023 | Nickel-63 in Liquid          | NI63_LSC             | 1         |      |    | 1         | 1         | 1         |          | 4         |
| PU            | F10-023 | Plutonium, Isotopic in Water | PUISO_PLATE_AEA      | 1         |      |    | 1         | 1         | 1         |          | 4         |
| SR            | F10-023 | Total Strontium in Water     | SRTOT_SEP_PRECIP_GPC | 1         |      |    | 1         | 1         | 1         |          | 4         |
| TC            | F10-023 | Technetium 99 in Water       | TC99_TR_SEP_GPC      | 1         |      |    | 1         | 1         | 1         |          | 4         |
| TH            | F10-023 | Thorium, Isotopic in Water   | THISO_IE_PLATE_AEA   | 1         |      |    | 1         | 1         | 1         |          | 4         |
| TP            | F10-023 | Americium 241/Curium         | AMCMISO_IE_PLATE_AEA | 1         |      |    | 1         | 1         | 1         |          | 4         |
| U             | F10-023 | Uranium, Isotopic in Water   | UIISO_PLATE_AEA      | 1         |      |    | 1         | 1         | 1         |          | 4         |
| <b>TOTALS</b> |         |                              |                      | <b>11</b> |      |    | <b>11</b> | <b>11</b> | <b>11</b> | <b>1</b> | <b>45</b> |

**WORK SUMMARY**

Page 2

**SUMMARY DATA SECTION**

Page 7

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 H4152

7762-003

Method Blank

METHOD BLANK

|                                   |                                      |                  |
|-----------------------------------|--------------------------------------|------------------|
| SDG <u>7762</u>                   | Client/Case no <u>CHPRC</u>          | SDG <u>H4152</u> |
| Contact <u>N. Joseph Verville</u> | Contract <u>No. 33677</u>            |                  |
| Lab sample id <u>S002030-03</u>   | Client sample id <u>Method Blank</u> |                  |
| Dept sample id <u>7762-003</u>    | Material/Matrix <u>WATER</u>         |                  |
|                                   | SAF No <u>F10-023</u>                |                  |

| ANALYTE         | CAS NO     | RESULT<br>pCi/L | 2σ ERR<br>(COUNT) | MDA<br>pCi/L | RDL<br>pCi/L | QUALI-<br>FIERS | TEST |
|-----------------|------------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Gross Alpha     | 12587-46-1 | 0.346           | 0.90              | 1.73         | 3.00         | U               | 93A  |
| Gross Beta      | 12587-47-2 | 0.088           | 1.5               | 2.57         | 4.00         | U               | 93B  |
| Tritium         | 10028-17-8 | -15.1           | 86                | 146          | 400          | U               | H    |
| Nickel 63       | 13981-37-8 | -0.038          | 1.6               | 2.83         | 15.0         | U               | NI_L |
| Technetium 99   | 14133-76-7 | -1.47           | 1.8               | 4.88         | 15.0         | U               | TC   |
| Uranium 233/234 | U-233/234  | -0.019          | 0.031             | 0.069        | 1.00         | U               | U    |
| Uranium 235     | 15117-96-1 | 0               | 0.015             | 0.036        | 1.00         | U               | U    |
| Uranium 238     | U-238      | -0.003          | 0.006             | 0.030        | 1.00         | U               | U    |
| Americium 241   | 14596-10-2 | -0.046          | 0.046             | 0.256        | 1.00         | U               | TP   |
| Curium 242      | 15510-73-3 | 0               | 0.046             | 0.177        | 1.00         | U               | TP   |
| Curium 243/244  | CM-243/244 | 0.046           | 0.093             | 0.177        | 1.00         | U               | TP   |
| Tin 126         | 15832-50-5 | U               |                   | 12.7         |              | U               | GAM  |
| Beryllium 7     | 13966-02-4 | U               |                   | 54.3         |              | U               | GAM  |
| Potassium 40    | 13966-00-2 | U               |                   | 103          |              | U               | GAM  |
| Cobalt 60       | 10198-40-0 | U               |                   | 8.87         | 25.0         | U               | GAM  |
| Ruthenium 106   | 13967-48-1 | U               |                   | 69.3         |              | U               | GAM  |
| Antimony 125    | 14234-35-6 | U               |                   | 18.7         |              | U               | GAM  |
| Cesium 134      | 13967-70-9 | U               |                   | 10.2         |              | U               | GAM  |
| Cesium 137      | 10045-97-3 | U               |                   | 8.72         | 15.0         | U               | GAM  |
| Europium 152    | 14683-23-9 | U               |                   | 21.4         | 50.0         | U               | GAM  |
| Europium 154    | 15585-10-1 | U               |                   | 26.5         | 50.0         | U               | GAM  |
| Europium 155    | 14391-16-3 | U               |                   | 17.0         | 50.0         | U               | GAM  |
| Niobium 94      | 14681-63-1 | U               |                   | 8.09         |              | U               | GAM  |
| Radium 226      | 13982-63-3 | U               |                   | 14.6         |              | U               | GAM  |
| Radium 228      | 15262-20-1 | U               |                   | 33.0         |              | U               | GAM  |

QC-BLANK #72281

|                             |
|-----------------------------|
| 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 H4152**

7762-007

Method Blank

**METHOD BLANK**

|                                   |                                      |                  |
|-----------------------------------|--------------------------------------|------------------|
| <u>SDG 7762</u>                   | <u>Client/Case no CHPRC</u>          | <u>SDG H4152</u> |
| <u>Contact N. Joseph Verville</u> | <u>Contract No. 33677</u>            |                  |
| <u>Lab sample id S002030-07</u>   | <u>Client sample id Method Blank</u> |                  |
| <u>Dept sample id 7762-007</u>    | <u>Material/Matrix WATER</u>         |                  |
|                                   | <u>SAF No F10-023</u>                |                  |

| ANALYTE           | CAS NO     | RESULT<br>pCi/L | 2σ ERR<br>(COUNT) | MDA<br>pCi/L | RDL<br>pCi/L | QUALI-<br>FIERS | TEST |
|-------------------|------------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Total Strontium   | SR-RAD     | -0.016          | 0.33              | 0.669        | 2.00         | U               | SR   |
| Thorium 228       | 14274-82-9 | 0.042           | 0.084             | 0.202        |              | U               | TH   |
| Thorium 230       | 14269-63-7 | 0.210           | 0.21              | 0.388        | 1.00         | U               | TH   |
| Thorium 232       | TH-232     | 0               | 0.042             | 0.161        | 1.00         | U               | TH   |
| Plutonium 238     | 13981-16-3 | 0               | 0.14              | 0.342        | 1.00         | U               | PU   |
| Plutonium 239/240 | PU-239/240 | 0               | 0.071             | 0.273        | 1.00         | U               | PU   |

QC-BLANK #72304

|                             |
|-----------------------------|
| 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 H4152

7762-004

B23K51

DUPLICATE

|                                   |                                 |   |
|-----------------------------------|---------------------------------|---|
| SDG <u>7762</u>                   | Client/Case no <u>CHPRC</u>     | <u>SDG H4152</u>                                    |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>       |   |
| DUPLICATE                         | ORIGINAL                        |   |
| Lab sample id <u>S002030-04</u>   | Lab sample id <u>S002030-01</u> | Client sample id <u>B23K51</u>                      |
| Dept sample id <u>7762-004</u>    | Dept sample id <u>7762-001</u>  | Location/Matrix <u>FT8</u> <u>WATER</u>             |
|                                   | Received <u>02/05/10</u>        | Collected/Volume <u>02/04/10 08:00</u> <u>6.0 L</u> |
|                                   |                                 | Custody/SAF No <u>F10-023-002</u> <u>F10-023</u>    |

| ANALYTE         | DUPLICATE |                   | MDA<br>pCi/L | RDL<br>pCi/L | QUALI-<br>FIERS | TEST | ORIGINAL |                   | MDA<br>pCi/L | QUALI-<br>FIERS | RPD<br>% | 3σ<br>TOT | DER<br>σ |
|-----------------|-----------|-------------------|--------------|--------------|-----------------|------|----------|-------------------|--------------|-----------------|----------|-----------|----------|
|                 | pCi/L     | 2σ ERR<br>(COUNT) |              |              |                 |      | pCi/L    | 2σ ERR<br>(COUNT) |              |                 |          |           |          |
| Gross Alpha     | 0.180     | 0.43              | 0.781        | 3.00         | U               | 93A  | 0.405    | 0.52              | 0.808        | U               | -        | -         | 0.7      |
| Gross Beta      | 1.14      | 1.4               | 2.27         | 4.00         | U               | 93B  | 2.98     | 1.4               | 2.08         | U               | 89       | 146       | 1.8      |
| Tritium         | 22.6      | 87                | 145          | 400          | U               | H    | 90.7     | 91                | 150          | U               | -        | -         | 1.1      |
| Nickel 63       | 1.60      | 1.8               | 2.97         | 15.0         | U               | NI_L | 1.73     | 1.7               | 2.85         | U               | -        | -         | 0.1      |
| Technetium 99   | 0.029     | 1.9               | 5.34         | 15.0         | U               | TC   | 0.528    | 2.0               | 4.94         | U               | -        | -         | 0.4      |
| Uranium 233/234 | -0.029    | 0.029             | 0.073        | 1.00         | U               | U    | -0.020   | 0.023             | 0.056        | U               | -        | -         | 0.5      |
| Uranium 235     | 0.026     | 0.026             | 0.041        | 1.00         | U               | U    | -0.010   | 0.014             | 0.042        | U               | -        | -         | 2.4      |
| Uranium 238     | -0.021    | 0.021             | 0.058        | 1.00         | U               | U    | -0.006   | 0.011             | 0.038        | U               | -        | -         | 1.3      |
| Americium 241   | -0.023    | 0.090             | 0.278        | 1.00         | U               | TP   | 0.100    | 0.13              | 0.320        | U               | -        | -         | 1.6      |
| Curium 242      | 0.023     | 0.093             | 0.178        | 1.00         | U               | TP   | 0        | 0.069             | 0.264        | U               | -        | -         | 0.4      |
| Curium 243/244  | 0.045     | 0.090             | 0.216        | 1.00         | U               | TP   | 0.033    | 0.13              | 0.256        | U               | -        | -         | 0.2      |
| Tin 126         | U         |                   | 11.3         |              | U               | GAM  | U        |                   | 13.7         | U               | -        | -         | 0.3      |
| Beryllium 7     | U         |                   | 45.0         |              | U               | GAM  | U        |                   | 49.9         | U               | -        | -         | 0.1      |
| Potassium 40    | U         |                   | 111          |              | U               | GAM  | U        |                   | 129          | U               | -        | -         | 0.2      |
| Cobalt 60       | U         |                   | 5.16         | 25.0         | U               | GAM  | U        |                   | 6.37         | U               | -        | -         | 0.3      |
| Ruthenium 106   | U         |                   | 45.0         |              | U               | GAM  | U        |                   | 56.8         | U               | -        | -         | 0.3      |
| Antimony 125    | U         |                   | 13.4         |              | U               | GAM  | U        |                   | 16.6         | U               | -        | -         | 0.3      |
| Cesium 134      | U         |                   | 6.51         |              | U               | GAM  | U        |                   | 8.00         | U               | -        | -         | 0.3      |
| Cesium 137      | U         |                   | 5.09         | 15.0         | U               | GAM  | U        |                   | 6.30         | U               | -        | -         | 0.3      |
| Europium 152    | U         |                   | 17.8         | 50.0         | U               | GAM  | U        |                   | 19.5         | U               | -        | -         | 0.1      |
| Europium 154    | U         |                   | 14.4         | 50.0         | U               | GAM  | U        |                   | 19.2         | U               | -        | -         | 0.4      |
| Europium 155    | U         |                   | 18.5         | 50.0         | U               | GAM  | U        |                   | 20.5         | U               | -        | -         | 0.1      |
| Niobium 94      | U         |                   | 4.68         |              | U               | GAM  | U        |                   | 5.25         | U               | -        | -         | 0.2      |
| Radium 226      | U         |                   | 12.0         |              | U               | GAM  | U        |                   | 14.0         | U               | -        | -         | 0.2      |
| Radium 228      | U         |                   | 25.1         |              | U               | GAM  | U        |                   | 28.3         | U               | -        | -         | 0.2      |

DUPLICATES

Page 1

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 H4152

7762-004

B23K51

DUPLICATE, cont.

|                                   |                                 |   |
|-----------------------------------|---------------------------------|---|
| SDG <u>7762</u>                   | Client/Case no <u>CHPRC</u>     | <u>SDG H4152</u>                                    |
| Contact <u>N. Joseph Verville</u> | Contract <u>No. 33677</u>       |   |
| <u>DUPLICATE</u>                  | <u>ORIGINAL</u>                 |   |
| Lab sample id <u>S002030-04</u>   | Lab sample id <u>S002030-01</u> | Client sample id <u>B23K51</u>                      |
| Dept sample id <u>7762-004</u>    | Dept sample id <u>7762-001</u>  | Location/Matrix <u>FT8</u> <u>WATER</u>             |
|                                   | Received <u>02/05/10</u>        | Collected/Volume <u>02/04/10 08:00</u> <u>6.0 L</u> |
|                                   |                                 | Custody/SAF No <u>F10-023-002</u> <u>F10-023</u>    |

QC-DUP#1 72282

ARRA Upper&Lower ALE Building Science Laboratory-QC

DUPLICATES

Page 2

SUMMARY DATA SECTION

Page 13

|                             |
|-----------------------------|
| 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 H4152

7762-008

B23K51

DUPLICATE

|                                   |                                 |   |
|-----------------------------------|---------------------------------|---|
| SDG <u>7762</u>                   | Client/Case no <u>CHPRC</u>     | <u>SDG H4152</u>                                    |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>       |   |
| <b>DUPLICATE</b>                  | <b>ORIGINAL</b>                 |   |
| Lab sample id <u>S002030-08</u>   | Lab sample id <u>S002030-01</u> | Client sample id <u>B23K51</u>                      |
| Dept sample id <u>7762-008</u>    | Dept sample id <u>7762-001</u>  | Location/Matrix <u>FTB</u> <u>WATER</u>             |
|                                   | Received <u>02/05/10</u>        | Collected/Volume <u>02/04/10 08:00</u> <u>6.0 L</u> |
|                                   |                                 | Custody/SAF No <u>F10-023-002</u> <u>F10-023</u>    |

| ANALYTE           | DUPLICATE<br>pCi/L | 2σ ERR<br>(COUNT) | MDA<br>pCi/L | RDL<br>pCi/L | QUALI-<br>FIERS | TEST | ORIGINAL<br>pCi/L | 2σ ERR<br>(COUNT) | MDA<br>pCi/L | QUALI-<br>FIERS | RPD<br>% | 3σ<br>TOT | DER<br>σ |
|-------------------|--------------------|-------------------|--------------|--------------|-----------------|------|-------------------|-------------------|--------------|-----------------|----------|-----------|----------|
| Total Strontium   | 0.273              | 0.31              | 0.560        | 2.00         | U               | SR   | 0.118             | 0.34              | 0.656        | U               | -        | 0.7       |          |
| Thorium 228       | 0                  | 0.094             | 0.225        |              | U               | TH   | 0                 | 0.11              | 0.269        | U               | -        | 0         |          |
| Thorium 230       | 0.094              | 0.24              | 0.433        | 1.00         | U               | TH   | 0.224             | 0.28              | 0.476        | U               | -        | 0.7       |          |
| Thorium 232       | 0                  | 0.047             | 0.180        | 1.00         | U               | TH   | 0                 | 0.056             | 0.215        | U               | -        | 0         |          |
| Plutonium 238     | 0.071              | 0.14              | 0.338        | 1.00         | U               | PU   | 0.080             | 0.16              | 0.384        | U               | -        | 0.1       |          |
| Plutonium 239/240 | 0                  | 0.071             | 0.270        | 1.00         | U               | PU   | 0                 | 0.080             | 0.307        | U               | -        | 0         |          |

QC-DUP#1 72305

ARRA Upper&Lower ALE Building Science Laboratory-QC

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

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4152

7762-005

B23K51

MATRIX SPIKE

|                                   |                                 |   |
|-----------------------------------|---------------------------------|---|
| SDG <u>7762</u>                   | Client/Case no <u>CHPRC</u>     | <u>SDG H4152</u>                                    |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>       |   |
| MATRIX SPIKE                      | ORIGINAL                        |   |
| Lab sample id <u>S002030-05</u>   | Lab sample id <u>S002030-01</u> | Client sample id <u>B23K51</u>                      |
| Dept sample id <u>7762-005</u>    | Dept sample id <u>7762-001</u>  | Location/Matrix <u>FT8</u> <u>WATER</u>             |
|                                   | Received <u>02/05/10</u>        | Collected/Volume <u>02/04/10 08:00</u> <u>6.0 L</u> |
|                                   |                                 | Custody/SAF No <u>F10-023-002</u> <u>F10-023</u>    |

| ANALYTE | SPIKE<br>pCi/L | 2σ ERR<br>(COUNT) | MDA<br>pCi/L | RDL<br>pCi/L | QUALI-<br>FIERS TEST | ADDED<br>pCi/L | 2σ ERR<br>pCi/L | ORIGINAL<br>pCi/L | 2σ ERR<br>(COUNT) | REC %<br>(TOTAL) | 3σ LMTS<br>(TOTAL) | PROTOCOL<br>LIMITS |
|---------|----------------|-------------------|--------------|--------------|----------------------|----------------|-----------------|-------------------|-------------------|------------------|--------------------|--------------------|
| Tritium | 13900          | 280               | 147          | 400          | X H                  | 14300          | 570             | 90.7              | 91                | 97               | 84-116             | 60-140             |

QC-MS#1 72299

ARRA Upper&Lower ALE Building Science Laboratory-QC

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

**EBERLINE ANALYTICAL / RICHMOND**  
**SAMPLE DELIVERY GROUP H4152**

7762-001

B23K51

**DATA SHEET**

|                                   |  |                  |
|-----------------------------------|--|------------------|
| SDG <u>7762</u>                   | Client/Case no <u>CHPRC</u>            | SDG <u>H4152</u> |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>              |                  |
| Lab sample id <u>S002030-01</u>   | Client sample id <u>B23K51</u>         |                  |
| Dept sample id <u>7762-001</u>    | Location/Matrix <u>FTB</u>             | <u>WATER</u>     |
| Received <u>02/05/10</u>          | Collected/Volume <u>02/04/10 08:00</u> | <u>6.0 L</u>     |
|                                   | Custody/SAF No <u>F10-023-002</u>      | <u>F10-023</u>   |

| ANALYTE           | CAS NO     | RESULT<br>pCi/L | 2σ ERR<br>(COUNT) | MDA<br>pCi/L | RDL<br>pCi/L | QUALI-<br>FIERS | TEST |
|-------------------|------------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Gross Alpha       | 12587-46-1 | 0.405           | 0.52              | 0.808        | 3.00         | U               | 93A  |
| Gross Beta        | 12587-47-2 | 2.98            | 1.4               | 2.08         | 4.00         |                 | 93B  |
| Tritium           | 10028-17-8 | 90.7            | 91                | 150          | 400          | U               | H    |
| Nickel 63         | 13981-37-8 | 1.73            | 1.7               | 2.85         | 15.0         | U               | NI_L |
| Total Strontium   | SR-RAD     | 0.118           | 0.34              | 0.656        | 2.00         | U               | SR   |
| Technetium 99     | 14133-76-7 | 0.528           | 2.0               | 4.94         | 15.0         | U               | TC   |
| Thorium 228       | 14274-82-9 | 0               | 0.11              | 0.269        |              | U               | TH   |
| Thorium 230       | 14269-63-7 | 0.224           | 0.28              | 0.476        | 1.00         | U               | TH   |
| Thorium 232       | TH-232     | 0               | 0.056             | 0.215        | 1.00         | U               | TH   |
| Uranium 233/234   | U-233/234  | -0.020          | 0.023             | 0.056        | 1.00         | U               | U    |
| Uranium 235       | 15117-96-1 | -0.010          | 0.014             | 0.042        | 1.00         | U               | U    |
| Uranium 238       | U-238      | -0.006          | 0.011             | 0.038        | 1.00         | U               | U    |
| Americium 241     | 14596-10-2 | 0.100           | 0.13              | 0.320        | 1.00         | U               | TP   |
| Curium 242        | 15510-73-3 | 0               | 0.069             | 0.264        | 1.00         | U               | TP   |
| Curium 243/244    | CM-243/244 | 0.033           | 0.13              | 0.256        | 1.00         | U               | TP   |
| Plutonium 238     | 13981-16-3 | 0.080           | 0.16              | 0.384        | 1.00         | U               | PU   |
| Plutonium 239/240 | PU-239/240 | 0               | 0.080             | 0.307        | 1.00         | U               | PU   |
| Tin 126           | 15832-50-5 | U               |                   | 13.7         |              | U               | GAM  |
| Beryllium 7       | 13966-02-4 | U               |                   | 49.9         |              | U               | GAM  |
| Potassium 40      | 13966-00-2 | U               |                   | 129          |              | U               | GAM  |
| Cobalt 60         | 10198-40-0 | U               |                   | 6.37         | 25.0         | U               | GAM  |
| Ruthenium 106     | 13967-48-1 | U               |                   | 56.8         |              | U               | GAM  |
| Antimony 125      | 14234-35-6 | U               |                   | 16.6         |              | U               | GAM  |
| Cesium 134        | 13967-70-9 | U               |                   | 8.00         |              | U               | GAM  |
| Cesium 137        | 10045-97-3 | U               |                   | 6.30         | 15.0         | U               | GAM  |
| Europium 152      | 14683-23-9 | U               |                   | 19.5         | 50.0         | U               | GAM  |
| Europium 154      | 15585-10-1 | U               |                   | 19.2         | 50.0         | U               | GAM  |
| Europium 155      | 14391-16-3 | U               |                   | 20.5         | 50.0         | U               | GAM  |

|                             |
|-----------------------------|
| 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 H4152

7762-001

B23K51

DATA SHEET, cont

|                                   |  |                  |
|-----------------------------------|--|------------------|
| SDG <u>7762</u>                   | Client/Case no <u>CHPRC</u>            | SDG <u>H4152</u> |
| Contact <u>N. Joseph Verville</u> | Contract No. <u>33677</u>              |                  |
| Lab sample id <u>S002030-01</u>   | Client sample id <u>B23K51</u>         |                  |
| Dept sample id <u>7762-001</u>    | Location/Matrix <u>FT8</u>             | <u>WATER</u>     |
| Received <u>02/05/10</u>          | Collected/Volume <u>02/04/10 08:00</u> | <u>6.0 L</u>     |
|                                   | Custody/SAP No <u>F10-023-002</u>      | <u>F10-023</u>   |

| ANALYTE    | CAS NO     | RESULT<br>pCi/L | 2σ ERR<br>(COUNT) | MDA<br>pCi/L | RDL<br>pCi/L | QUALI-<br>FIERS | TEST |
|------------|------------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Niobium 94 | 14681-63-1 | U               |                   | 5.25         |              | U               | GAM  |
| Radium 226 | 13982-63-3 | U               |                   | 14.0         |              | U               | GAM  |
| Radium 228 | 15262-20-1 | U               |                   | 28.3         |              | U               | GAM  |

ARRA Upper&Lower ALE Building Science Laboratory-QC

**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP H4152

**LAB METHOD SUMMARY**

PLUTONIUM, ISOTOPIC IN WATER  
ALPHA SPECTROSCOPY

Test PU Matrix WATER  
SDG 7762  
Contact N. Joseph Verville

Client CHPRC  
Contract No. 33677  
Contract SDG H4152

**RESULTS**

| LAB                                   | RAW  | SUF- |              | Plutonium              | Plutonium |         |
|---------------------------------------|------|------|--------------|------------------------|-----------|---------|
| SAMPLE ID                             | TEST | FIX  | PLANCHET     | CLIENT SAMPLE ID       | 238       | 239/240 |
| Preparation batch 7240-143            |      |      |              |                        |           |         |
| S002030-01                            |      |      | 7762-001     | B23K51                 | U         | U       |
| S002030-06                            |      |      | 7762-006     | Lab Control Sample     | ok        | ok      |
| S002030-07                            |      |      | 7762-007     | Method Blank           | U         | U       |
| S002030-08                            |      |      | 7762-008     | Duplicate (S002030-01) | - U       | - U     |
| Nominal values and limits from method |      |      | RDLs (pCi/L) | 1.00                   | 1.00      |         |

**METHOD PERFORMANCE**

| LAB                                   | RAW  | SUF- |                        | MAX MDA                                | ALIQU | PREP | DILU- | YIELD  | EFF | COUNT | FWHM | DRIFT | DAYS | ANAL-    |       |          |
|---------------------------------------|------|------|------------------------|--|-------|------|-------|--------|-----|-------|------|-------|------|----------|-------|----------|
| SAMPLE ID                             | TEST | FIX  | CLIENT SAMPLE ID       | pCi/L                                  | L     | FAC  | TION  | %      | %   | min   | keV  | KeV   | HELD | PREPARED | YZED  | DETECTOR |
| Preparation batch 7240-143            |      |      | 2σ prep error 8.0 %    | Reference Lab Notebook No. 7243 pg 143 |       |      |       |        |     |       |      |       |      |          |       |          |
| S002030-01                            |      |      | B23K51                 | 0.384                                  | 0.400 |      |       | 65     | 109 |       |      |       | 7    | 02/11/10 | 02/11 | SS-063   |
| S002030-06                            |      |      | Lab Control Sample     | 0.291                                  | 0.400 |      |       | 74     | 109 |       |      |       |      | 02/11/10 | 02/11 | SS-064   |
| S002030-07                            |      |      | Method Blank           | 0.342                                  | 0.400 |      |       | 74     | 110 |       |      |       |      | 02/11/10 | 02/11 | SS-065   |
| S002030-08                            |      |      | Duplicate (S002030-01) | 0.338                                  | 0.400 |      |       | 75     | 110 |       |      |       | 7    | 02/11/10 | 02/11 | SS-061   |
| Nominal values and limits from method |      |      |                        | 1.00                                   | 0.400 |      |       | 30-110 | 100 | 100   |      |       | 180  |          |       |          |

| PROCEDURES | REFERENCE | PUIISO_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>0.339</u> ± <u>0.076</u> |
| FOR 4 SAMPLES   | YIELD | <u>72</u> ± <u>9</u>        |

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 H4152

**LAB METHOD SUMMARY**

THORIUM, ISOTOPIC IN WATER

ALPHA SPECTROSCOPY

Test TH Matrix WATER  
 SDG 7762  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4152

**RESULTS**

LAB RAW SUF-  
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Thorium 228 Thorium 230 Thorium 232

Preparation batch 7240-143

|            |          |                        |   |   |    |   |
|------------|----------|------------------------|---|---|----|---|
| S002030-01 | 7762-001 | B23K51                 |   | U | U  | U |
| S002030-06 | 7762-006 | Lab Control Sample     |   |   | ok |   |
| S002030-07 | 7762-007 | Method Blank           |   | U | U  | U |
| S002030-08 | 7762-008 | Duplicate (S002030-01) | - | U | -  | U |

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

Preparation batch 7240-143 2σ prep error 8.0 % Reference Lab Notebook No. 7243 pg 143

|            |                        |       |       |    |     |   |          |       |        |
|------------|------------------------|-------|-------|----|-----|---|----------|-------|--------|
| S002030-01 | B23K51                 | 0.476 | 0.400 | 77 | 164 | 7 | 02/11/10 | 02/11 | SS-031 |
| S002030-06 | Lab Control Sample     | 0.431 | 0.400 | 92 | 164 |   | 02/11/10 | 02/11 | SS-032 |
| S002030-07 | Method Blank           | 0.388 | 0.400 | 88 | 164 |   | 02/11/10 | 02/11 | SS-033 |
| S002030-08 | Duplicate (S002030-01) | 0.433 | 0.400 | 92 | 165 | 7 | 02/11/10 | 02/11 | SS-034 |

Nominal values and limits from method 1.00 0.400 30-110 150 100 180

| PROCEDURES | REFERENCE | THISO_IE_PLATE_AEA   |
|------------|-----------|--|
| SPP-062    |           | Sample Aliquoting, rev 1   |
| 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   | <u>0.432 ± 0.072</u> |
| FOR 4 SAMPLES   | YIELD | <u>87 ± 14</u>       |

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 H4152

LAB METHOD SUMMARY

AMERICIUM 241/CURIUM  
ALPHA SPECTROSCOPY

Test TP Matrix WATER  
SDG 7762  
Contact N. Joseph Verville

Client CHPRC  
Contract No. 33677  
Contract SDG H4152

RESULTS

| LAB                                   | RAW      | SUF-     |                        | Americium | Curium  |
|---------------------------------------|----------|----------|------------------------|-----------|---------|
| SAMPLE ID                             | TEST FIX | PLANCHET | CLIENT SAMPLE ID       | 241       | 243/244 |
| Preparation batch 7240-143            |          |          |                        |           |         |
| S002030-01                            |          | 7762-001 | B23K51                 | U         | U       |
| S002030-02                            |          | 7762-002 | Lab Control Sample     | ok        | ok      |
| S002030-03                            |          | 7762-003 | Method Blank           | U         | U       |
| S002030-04                            |          | 7762-004 | Duplicate (S002030-01) | - U       | - U     |
| Nominal values and limits from method |          |          | RDLs (pCi/L)           | 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/L               | L     | FAC                                    | TION  | %      | %   | min   | keV  | KeV   | HELD | PREPARED | YZED  | DETECTOR |
| Preparation batch 7240-143            |          |                        | 2σ prep error 8.0 % |       | Reference Lab Notebook No. 7243 pg 143 |       |        |     |       |      |       |      |          |       |          |
| S002030-01                            |          | B23K51                 | 0.320               | 0.500 |  |       | 58     | 118 |       |      |       | 7    | 02/11/10 | 02/11 | SS-055   |
| S002030-02                            |          | Lab Control Sample     | 0.285               | 0.500 |  |       | 82     | 119 |       |      |       |      | 02/11/10 | 02/11 | SS-056   |
| S002030-03                            |          | Method Blank           | 0.256               | 0.500 |  |       | 81     | 119 |       |      |       |      | 02/11/10 | 02/11 | SS-058   |
| S002030-04                            |          | Duplicate (S002030-01) | 0.278               | 0.500 |  |       | 87     | 119 |       |      |       | 7    | 02/11/10 | 02/11 | SS-061   |
| Nominal values and limits from method |          |                        | 1.00                | 0.500 |  |       | 30-110 | 100 | 100   |      |       | 180  |          |       |          |

| PROCEDURES | REFERENCE | AMCMISO_IE_PLATE_AEA  |
|------------|-----------|---|
| CP-002     |           | Q.C. Preparation, rev 9   |
| CP-003     |           | Addition of Carriers and Tracers, rev 9                           |
| CP-040     |           | Environmental Water Dissolution, rev 9                            |
| CP-961     |           | Am-Cm Purification, Large Aliquot by Oxalate Precipitation, rev 5 |
| CP-008     |           | Heavy Element Electroplating, rev 13                              |

|                 |       |                             |
|-----------------|-------|-----------------------------|
| AVERAGES ± 2 SD | MDA   | <u>0.285</u> ± <u>0.053</u> |
| FOR 4 SAMPLES   | YIELD | <u>77</u> ± <u>26</u>       |

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 H4152

**LAB METHOD SUMMARY**

URANIUM, ISOTOPIC IN WATER  
ALPHA SPECTROSCOPY

Test U Matrix WATER  
SDG 7762  
Contact N. Joseph Verville

Client CHPRC  
Contract No. 33677  
Contract SDG H4152

**RESULTS**

| LAB                                   | RAW      | SUF-     |                        | 1: Uranium   | 2: Uranium | 3: Uranium | RESULT RATIOS (%) |     |     |    |
|---------------------------------------|----------|----------|------------------------|--------------|------------|------------|-------------------|-----|-----|----|
| SAMPLE ID                             | TEST FIX | PLANCHET | CLIENT SAMPLE ID       | 233/234      | 235        | 238        | 1+3               | 2σ  | 2+3 | 2σ |
| Preparation batch 7240-143            |          |          |                        |              |            |            |                   |     |     |    |
| S002030-01                            |          | 7762-001 | B23K51                 | U            | U          | U          |                   |     |     |    |
| S002030-02                            |          | 7762-002 | Lab Control Sample     | ok           | ok         | ok         |                   |     |     |    |
| S002030-03                            |          | 7762-003 | Method Blank           | U            | U          | U          |                   |     |     |    |
| S002030-04                            |          | 7762-004 | Duplicate (S002030-01) | - U          | - U        | - U        |                   |     |     |    |
| Nominal values and limits from method |          |          |                        | RDLs (pCi/L) | 1.00       | 1.00       | 1.00              | 100 |     | 4  |
| Averages                              |          |          |                        |              |            |            |                   |     |     |    |

**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/L               | L     | FAC                                    | TION  | %      | %   | min   | keV  | KeV   | HELD | PREPARED | YZED  | DETECTOR |
| Preparation batch 7240-143            |          |                        |  | 2σ prep error 8.0 % |       | Reference Lab Notebook No. 7243 pg 143 |       |        |     |       |      |       |      |          |       |          |
| S002030-01                            |          | B23K51                 |  | 0.056               | 0.500 |  |       | 101    |     | 815   |      |       | 6    | 02/10/10 | 02/10 | SS-035   |
| S002030-02                            |          | Lab Control Sample     |  | 0.220               | 0.500 |  |       | 98     |     | 815   |      |       |      | 02/10/10 | 02/10 | SS-036   |
| S002030-03                            |          | Method Blank           |  | 0.069               | 0.500 |  |       | 91     |     | 815   |      |       |      | 02/10/10 | 02/10 | SS-037   |
| S002030-04                            |          | Duplicate (S002030-01) |  | 0.073               | 0.500 |  |       | 93     |     | 815   |      |       | 6    | 02/10/10 | 02/10 | SS-038   |
| Nominal values and limits from method |          |                        |  | 1.00                | 0.500 |  |       | 30-110 |     | 100   | 100  |       | 180  |          |       |          |

PROCEDURES REFERENCE UIISO\_PLATE\_AEA  
SPP-062 Sample Aliquoting, rev 1  
CP-921 Uranium in Water and Dissolved Samples by  
Extraction Chromatography, rev 5  
CP-008 Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD MDA 0.104 ± 0.155  
FOR 4 SAMPLES YIELD 96 ± 9

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 H4152

**LAB METHOD SUMMARY**

TOTAL STRONTIUM IN WATER

BETA COUNTING

Test SR Matrix WATER  
 SDG 7762  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4152

**RESULTS**

| LAB                                   | RAW  | SUF- |          | Total                  |                   |
|---------------------------------------|------|------|----------|------------------------|-------------------|
| SAMPLE ID                             | TEST | FIX  | PLANCHET | CLIENT SAMPLE ID       | Strontium         |
| Preparation batch 7240-143            |      |      |          |                        |                   |
| S002030-01                            |      |      | 7762-001 | B23K51                 | U                 |
| S002030-06                            |      |      | 7762-006 | Lab Control Sample     | ok                |
| S002030-07                            |      |      | 7762-007 | Method Blank           | U                 |
| S002030-08                            |      |      | 7762-008 | Duplicate (S002030-01) | - U               |
| Nominal values and limits from method |      |      |          |                        | RDLs (pCi/L) 2.00 |

**METHOD PERFORMANCE**

| LAB  | RAW  | SUF- | MDA                    | ALIQ      | PREP  | DILU- | YIELD | EFF  | COUNT  | FWHM | DRIFT | DAYS | ANAL- |          |          |      |          |
|--|------|------|------------------------|-----------|-------|-------|-------|------|--------|------|-------|------|-------|----------|----------|------|----------|
| SAMPLE ID  | TEST | FIX  | CLIENT                 | SAMPLE ID | pCi/L | L     | FAC   | TION | %      | %    | min   | keV  | KeV   | HELD     | PREPARED | YZED | DETECTOR |
| Preparation batch 7240-143 2σ prep error 10.4 % Reference Lab Notebook No. 7243 pg 143 |      |      |                        |           |       |       |       |      |        |      |       |      |       |          |          |      |          |
| S002030-01   |      |      | B23K51                 |           | 0.656 | 0.500 |       |      | 93     | 100  |       |      | 6     | 02/10/10 | 02/10    |      | GRB-225  |
| S002030-06   |      |      | Lab Control Sample     |           | 0.548 | 0.500 |       |      | 91     | 100  |       |      |       | 02/10/10 | 02/10    |      | GRB-221  |
| S002030-07   |      |      | Method Blank           |           | 0.669 | 0.500 |       |      | 90     | 100  |       |      |       | 02/10/10 | 02/10    |      | GRB-227  |
| S002030-08   |      |      | Duplicate (S002030-01) |           | 0.560 | 0.500 |       |      | 86     | 100  |       |      | 6     | 02/10/10 | 02/10    |      | GRB-223  |
| Nominal values and limits from method  |      |      |                        |           |       |       |       |      |        |      |       |      |       |          |          |      |          |
|  |      |      |                        |           | 2.00  | 0.500 |       |      | 40-110 | 100  |       |      | 180   |          |          |      |          |

PROCEDURES REFERENCE SRTOT\_SEP\_PRECIP\_GPC  
 SPP-062 Sample Aliquoting, rev 1  
 CP-380 Strontium in Water Samples, rev 5

AVERAGES ± 2 SD MDA 0.608 ± 0.126  
 FOR 4 SAMPLES YIELD 90 ± 6

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 H4152

**LAB METHOD SUMMARY**

TECHNETIUM 99 IN WATER

BETA COUNTING

Test TC Matrix WATER  
 SDG 7762  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4152

**RESULTS**

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

Preparation batch 7240-143

|            |          |                        |     |
|------------|----------|------------------------|-----|
| S002030-01 | 7762-001 | B23K51                 | U   |
| S002030-02 | 7762-002 | Lab Control Sample     | ok  |
| S002030-03 | 7762-003 | Method Blank           | U   |
| S002030-04 | 7762-004 | Duplicate (S002030-01) | - U |

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

Preparation batch 7240-143 2σ prep error 13.2 % Reference Lab Notebook No. 7243 pg 143

|            |                        |      |       |    |     |   |          |       |         |
|------------|------------------------|------|-------|----|-----|---|----------|-------|---------|
| S002030-01 | B23K51                 | 4.94 | 0.100 | 70 | 100 | 5 | 02/06/10 | 02/09 | GRB-202 |
| S002030-02 | Lab Control Sample     | 4.07 | 0.100 | 91 | 100 |   | 02/06/10 | 02/09 | GRB-204 |
| S002030-03 | Method Blank           | 4.88 | 0.100 | 77 | 100 |   | 02/06/10 | 02/10 | GRB-207 |
| S002030-04 | Duplicate (S002030-01) | 5.34 | 0.100 | 70 | 100 | 5 | 02/06/10 | 02/09 | GRB-207 |

Nominal values and limits from method 15.0 0.100 30-110 50 180

|            |           |   |
|------------|-----------|---|
| PROCEDURES | REFERENCE | TC99_TR_SEP_GPC   |
|            | SPP-062   | Sample Aliquoting, rev 1  |
|            | 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   | <u>4.81</u> ± <u>1.06</u> |
| FOR 4 SAMPLES   | YIELD | <u>77</u> ± <u>20</u>     |

METHOD SUMMARIES  
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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 H4152

**LAB METHOD SUMMARY**

GROSS ALPHA IN WATER

GAS PROPORTIONAL COUNTING

Test 93A Matrix WATER  
 SDG 7762  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4152

**RESULTS**

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

Preparation batch 7240-143

|            |    |  |          |                        |     |
|------------|----|--|----------|------------------------|-----|
| S002030-01 | 93 |  | 7762-001 | B23K51                 | U   |
| S002030-02 | 93 |  | 7762-002 | Lab Control Sample     | ok  |
| S002030-03 | 93 |  | 7762-003 | Method Blank           | U   |
| S002030-04 | 93 |  | 7762-004 | Duplicate (S002030-01) | - U |

Nominal values and limits from method RDLs (pCi/L) 3.00

**METHOD PERFORMANCE**

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

Preparation batch 7240-143 2σ prep error 20.6 % Reference Lab Notebook No. 7243 pg 143

|            |    |  |                        |       |       |  |    |     |  |   |          |       |         |
|------------|----|--|------------------------|-------|-------|--|----|-----|--|---|----------|-------|---------|
| S002030-01 | 93 |  | B23K51                 | 0.808 | 0.235 |  | 0  | 100 |  | 5 | 02/09/10 | 02/09 | GRB-101 |
| S002030-02 | 93 |  | Lab Control Sample     | 1.77  | 0.200 |  | 60 | 100 |  |   | 02/09/10 | 02/09 | GRB-103 |
| S002030-03 | 93 |  | Method Blank           | 1.73  | 0.200 |  | 63 | 100 |  |   | 02/09/10 | 02/10 | GRB-101 |
| S002030-04 | 93 |  | Duplicate (S002030-01) | 0.781 | 0.235 |  | 0  | 100 |  | 5 | 02/09/10 | 02/09 | GRB-105 |

Nominal values and limits from method 3.00 0.200 5-250 100 180

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
 SPP-007 Aqueous Sample Receipt by Chemistry Laboratory, rev 1  
 SPP-120 Gross Alpha and Gross Beta in Water, rev 3

AVERAGES ± 2 SD MDA 1.27 ± 1.10  
 FOR 4 SAMPLES RESIDUE 31 ± 71

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 H4152

**LAB METHOD SUMMARY**

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

Test 93B Matrix WATER  
 SDG 7762  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4152

**RESULTS**

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

Preparation batch 7240-143

|            |    |          |                        |      |
|------------|----|----------|------------------------|------|
| S002030-01 | 93 | 7762-001 | B23K51                 | 2.98 |
| S002030-02 | 93 | 7762-002 | Lab Control Sample     | ok   |
| S002030-03 | 93 | 7762-003 | Method Blank           | U    |
| S002030-04 | 93 | 7762-004 | Duplicate (S002030-01) | ok U |

Nominal values and limits from method RDLs (pCi/L) 4.00

**METHOD PERFORMANCE**

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

Preparation batch 7240-143 2σ prep error 11.0 % Reference Lab Notebook No. 7243 pg 143

|            |    |                        |      |       |    |     |   |          |       |         |
|------------|----|------------------------|------|-------|----|-----|---|----------|-------|---------|
| S002030-01 | 93 | B23K51                 | 2.08 | 0.235 | 0  | 100 | 5 | 02/09/10 | 02/09 | GRB-101 |
| S002030-02 | 93 | Lab Control Sample     | 3.21 | 0.200 | 60 | 100 |   | 02/09/10 | 02/09 | GRB-103 |
| S002030-03 | 93 | Method Blank           | 2.57 | 0.200 | 63 | 100 |   | 02/09/10 | 02/10 | GRB-101 |
| S002030-04 | 93 | Duplicate (S002030-01) | 2.27 | 0.235 | 0  | 100 | 5 | 02/09/10 | 02/09 | GRB-105 |

Nominal values and limits from method 4.00 0.200 5-250 100 180

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
 SPP-007 Aqueous Sample Receipt by Chemistry Laboratory, rev 1  
 SPP-120 Gross Alpha and Gross Beta in Water, rev 3

AVERAGES ± 2 SD MDA 2.53 ± 0.989  
 FOR 4 SAMPLES RESIDUE 31 ± 71

METHOD SUMMARIES

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SUMMARY DATA SECTION

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

**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP H4152

Test GAM Matrix WATER  
 SDG 7762  
 Contact N. Joseph Verville

**LAB METHOD SUMMARY**

GAMMA EMITTERS  
 GAMMA SPECTROSCOPY

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4152

**RESULTS**

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

Preparation batch 7240-143

|            |          |                        |  |     |     |
|------------|----------|------------------------|--|-----|-----|
| S002030-01 | 7762-001 | B23K51                 |  | U   | U   |
| S002030-02 | 7762-002 | Lab Control Sample     |  | ok  | ok  |
| S002030-03 | 7762-003 | Method Blank           |  | U   | U   |
| S002030-04 | 7762-004 | Duplicate (S002030-01) |  | - U | - U |

Nominal values and limits from method RDLs (pCi/L) 25.0 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/L L FAC TION % % min keV KeV HELD PREPARED YZED DETECTOR

Preparation batch 7240-143 2σ prep error 7.0 % Reference Lab Notebook No. 7243 pg 143

|            |                        |  |      |       |  |  |  |  |     |  |   |          |       |          |
|------------|------------------------|--|------|-------|--|--|--|--|-----|--|---|----------|-------|----------|
| S002030-01 | B23K51                 |  | 41.4 | 0.500 |  |  |  |  | 505 |  | 4 | 02/06/10 | 02/08 | 01,02,00 |
| S002030-02 | Lab Control Sample     |  | 21.9 | 0.500 |  |  |  |  | 506 |  |   | 02/06/10 | 02/08 | MB,05,00 |
| S002030-03 | Method Blank           |  | 33.1 | 0.500 |  |  |  |  | 506 |  |   | 02/06/10 | 02/08 | 01,04,00 |
| S002030-04 | Duplicate (S002030-01) |  | 34.3 | 0.500 |  |  |  |  | 732 |  | 6 | 02/06/10 | 02/10 | 01,02,00 |

Nominal values and limits from method 15.0 0.500 100 180

PROCEDURES REFERENCE GAMMA\_GS  
 SPP-007 Aqueous Sample Receipt by Chemistry Laboratory,  
 rev 1  
 SPP-100 Preparation of Sample for Gamma Spectroscopy,  
 rev 0

AVERAGES ± 2 SD MDA 32.7 ± 16.1  
 FOR 4 SAMPLES YIELD \_\_\_\_\_ ± \_\_\_\_\_

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE  
 Protocol CHPRC  
 Version Ver 1.0  
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 Version 3.06  
 Report date 02/12/10

**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP H4152

**LAB METHOD SUMMARY**

TRITIUM IN WATER

LIQUID SCINTILLATION COUNTING

Test H Matrix WATER  
 SDG 7762  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4152

**RESULTS**

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

Preparation batch 7240-143

|            |          |                        |      |
|------------|----------|------------------------|------|
| S002030-01 | 7762-001 | B23K51                 | U    |
| S002030-02 | 7762-002 | Lab Control Sample     | ok   |
| S002030-03 | 7762-003 | Method Blank           | U    |
| S002030-04 | 7762-004 | Duplicate (S002030-01) | - U  |
| S002030-05 | 7762-005 | Spike (S002030-01)     | ok X |

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

Preparation batch 7240-143 2σ prep error 10.0 % Reference Lab Notebook No. 7243 pg 143

|            |                        |     |        |     |     |   |          |       |         |
|------------|------------------------|-----|--------|-----|-----|---|----------|-------|---------|
| S002030-01 | B23K51                 | 150 | 0.0100 | 100 | 200 | 4 | 02/08/10 | 02/08 | LSC-006 |
| S002030-02 | Lab Control Sample     | 146 | 0.100  | 10  | 200 |   | 02/08/10 | 02/08 | LSC-006 |
| S002030-03 | Method Blank           | 146 | 0.100  | 10  | 200 |   | 02/08/10 | 02/08 | LSC-006 |
| S002030-04 | Duplicate (S002030-01) | 145 | 0.0100 | 100 | 200 | 4 | 02/08/10 | 02/08 | LSC-006 |
| S002030-05 | Spike (S002030-01)     | 147 | 0.0500 | 20  | 200 | 4 | 02/08/10 | 02/08 | LSC-006 |

Nominal values and limits from method 400 0.0100 25 180

PROCEDURES REFERENCE 906.0\_H3\_LSC  
 CP-210 Tritium in Water Samples by Distillation, rev 11

AVERAGES ± 2 SD MDA 147 ± 3.85  
 FOR 5 SAMPLES YIELD 48 ± 95

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 H4152

**LAB METHOD SUMMARY**

NICKEL-63 IN LIQUID

LIQUID SCINTILLATION COUNTING

Test NI L Matrix WATER  
 SDG 7762  
 Contact N. Joseph Verville

Client CHPRC  
 Contract No. 33677  
 Contract SDG H4152

**RESULTS**

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

Preparation batch 7240-143

|            |          |                        |     |
|------------|----------|------------------------|-----|
| S002030-01 | 7762-001 | B23K51                 | U   |
| S002030-02 | 7762-002 | Lab Control Sample     | ok  |
| S002030-03 | 7762-003 | Method Blank           | U   |
| S002030-04 | 7762-004 | Duplicate (S002030-01) | - U |

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

Preparation batch 7240-143 2σ prep error 11.2 % Reference Lab Notebook No. 7243 pg 143

|            |                        |      |       |     |    |   |          |       |         |
|------------|------------------------|------|-------|-----|----|---|----------|-------|---------|
| S002030-01 | B23K51                 | 2.85 | 0.500 | 101 | 50 | 6 | 02/10/10 | 02/10 | LSC-006 |
| S002030-02 | Lab Control Sample     | 2.81 | 0.500 | 101 | 50 |   | 02/10/10 | 02/10 | LSC-006 |
| S002030-03 | Method Blank           | 2.83 | 0.500 | 100 | 50 |   | 02/10/10 | 02/10 | LSC-006 |
| S002030-04 | Duplicate (S002030-01) | 2.97 | 0.500 | 95  | 50 | 6 | 02/10/10 | 02/10 | LSC-006 |

Nominal values and limits from method 15.0 0.500 40-110 50 180

PROCEDURES REFERENCE NI63\_LSC  
 SPP-040 Environmental Water Dissolution, rev 2  
 CP-280 Nickel-63 Purification, rev 5

AVERAGES ± 2 SD MDA 2.86 ± 0.144  
 FOR 4 SAMPLES YIELD 99 ± 6

METHOD SUMMARIES

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4152

SDG 7762  
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC  
 Contract No. 33677  
 Case no SDG\_H4152

SAMPLE SUMMARY

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

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

The following notes apply to these reports:

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

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

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

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 Version 3.06  
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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4152

SDG 7762  
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC  
 Contract No. 33677  
 Case no SDG\_H4152

PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

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

These qualifiers should be reviewed as follows:

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

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

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 Protocol CHPRC  
 Version Ver 1.0  
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SAMPLE DELIVERY GROUP H4152

SDG 7762  
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC  
 Contract No. 33677  
 Case no SDG\_H4152

WORK SUMMARY

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

The following notes apply to this report:

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

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SUMMARY DATA SECTION

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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4152

SDG 7762  
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC  
 Contract No. 33677  
 Case no SDG H4152

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).

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 H4152

SDG 7762  
 Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC  
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 Case no SDG H4152

DATA SHEET

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

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

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

The following values are underlined to indicate possible problems:

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

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP H4152

SDG 7762  
Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC  
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DATA SHEET

- \* 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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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4152

SDG 7762  
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC  
 Contract No. 33677  
 Case no SDG\_H4152

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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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4152

SDG 7762  
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC  
 Contract No. 33677  
 Case no SDG\_H4152

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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EBERLINE ANALYTICAL / RICHMOND

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SDG 7762  
 Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC  
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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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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4152

SDG 7762  
 Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC  
 Contract No. 33677  
 Case no SDG\_H4152

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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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4152

SDG 7762  
Contact N. Joseph Verville

GUIDE, c'ont.

Client CHPRC  
Contract No. 33677  
Case no SDG\_H4152

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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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP H4152

SDG 7762  
Contact N. Joseph Verville

REPORT GUIDE

Client CHPRC  
Contract No. 33677  
Case no SDG\_H4152

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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SAMPLE DELIVERY GROUP H4152

SDG 7762  
 Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC  
 Contract No. 33677  
 Case no SDG H4152

METHOD SUMMARY

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.

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 H4152

SDG 7762  
 Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC  
 Contract No. 33677  
 Case no SDG\_H4152

METHOD SUMMARY

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

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

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

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

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

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

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 H4152

SDG 7762  
 Contact N. Joseph Verville

GUIDE, cont.

Client CHPRC  
 Contract No. 33677  
 Case no SDG\_H4152

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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

| CH2MHill Plateau Remediation Company   |  | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST                                       |  |   |  |   |                | F10-023-002   | PAGE 1 OF 1  |  |                        |
|--|--|--|--|---|--|---|----------------|---|--|--|------------------------|
| COLLECTOR<br><i>AL McIntyre</i>  |  | COMPANY CONTACT<br>WIDRIG, DL <i>H452</i>                                      |  | TELEPHONE NO.<br>376-2858 <i>(7762)</i> |  | PROJECT COORDINATOR<br>WIDRIG, DL                               |                | PRICE CODE<br>7B  | DATA<br>TURNAROUND<br>7 Days / 15 Days   |  |                        |
| SAMPLING LOCATION<br>FTB   |  | PROJECT DESIGNATION<br>ARRA Upper & Lower ALE Building Science Laboratory - QC |  |   |  | SAF NO.<br>F10-023  |                | AIR QUALITY<br><input type="checkbox"/>   |  |  |                        |
| ICE CHEST NO.<br><i>GWS-121</i>  |  | FIELD LOGBOOK NO.<br><i>HNF-N-507-8</i>  |  | ACTUAL SAMPLE DEPTH                     |  | COA<br>302228ES10   |                | METHOD OF SHIPMENT<br>GOVERNMENT VEHICLE  |  |  |                        |
| SHIPPED TO<br>Waste Sampling & Characterization <i>Eberline</i>  |  | OFFSITE PROPERTY NO.<br><i>N/A 2-410 00727</i>                                 |  |   |  | BILL OF LADING/AIR BILL NO.<br><i>N/A 2-4-10 7983 6540 5740</i> |                |   |  |  |                        |
| MATRIX*<br>A=Air<br>DL=Drum<br>Liquids<br>DS=Drum<br>Solids<br>L=Liquid<br>O=Oil<br>S=Soil<br>SE=Sediment<br>T=Tissue<br>V=Vegetation<br>W=Water<br>WI=Wipe<br>X=Other | <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>HNO3 to pH <2<br>HNO3 to pH <2<br>HNO3 to pH <2 |   | HNO3 to pH <2<br>HCl to pH <2<br>HNO3 to pH <2       |   | None           |   |  |  |                        |
|  | <b>TYPE OF CONTAINER</b><br>Square Bottle - Poly   |  | G/P<br>G/P   |   | G/P<br>G/P   |   | G/P            |   | G  |  |                        |
|  | <b>NO. OF CONTAINER(S)</b><br>1  |  | 1  |   | 1  |   | 1              |   | 1  |  |                        |
|  | <b>VOLUME</b><br>500mL   |  | 500mL  |   | 1000mL   |   | 1000mL         |   | 250mL  |  |                        |
|  | <b>SPECIAL HANDLING AND/OR STORAGE</b>   |  | <b>SAMPLE ANALYSIS</b><br>SEE ITEM (1) IN SPECIAL INSTRUCTIONS         |   | Gross Alpha (Gross alpha)<br>Gross Beta (Gross beta) |   | Americium-241; |   | SEE ITEM (2) IN SPECIAL INSTRUCTIONS<br>Technetium-99; Americium-241/Curium-244 (Curium-244) |  | Tritium - H3 (Tritium) |
| <b>SAMPLE NO.</b>  |  | <b>MATRIX*</b>   |  | <b>SAMPLE DATE</b>                      |  | <b>SAMPLE TIME</b>  |                |   |  |  |                        |
| B23K51   |  | WATER  |  | <i>2/4/10 0800</i>                      |  | <i>✓ ✓ ✓ ✓ ✓ ✓</i>  |                |   |  |  |                        |
| <b>CHAIN OF POSSESSION</b>   |  |  |  | <b>SIGN/ PRINT NAMES</b>                |  |   |                | <b>SPECIAL INSTRUCTIONS</b>   |  |  |                        |
| RELINQUISHED BY/REMOVED FROM<br><i>AR McIntyre</i>   |  | DATE/TIME<br><i>3/4/10 1400</i>  |  | RECEIVED BY/STORED IN<br><i>Fed RP</i>  |  | DATE/TIME   |                | ** The CACN for all analytical work at WSCF laboratory is 401587.<br>(1)Gamma Spectroscopy {Europium-155, Europium-154, Cesium-137, Europium-152, Cobalt-60}<br>(2)Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238} |  |  |                        |
| RELINQUISHED BY/REMOVED FROM<br><i>Fed Ex</i>  |  | DATE/TIME  |  | RECEIVED BY/STORED IN<br><i>Fed Ex</i>  |  | DATE/TIME<br><i>02/05/10 0915</i>                               |                |    |  |  |                        |
| RELINQUISHED BY/REMOVED FROM   |  | DATE/TIME  |  | RECEIVED BY/STORED IN                   |  | DATE/TIME   |                |   |  |  |                        |
| RELINQUISHED BY/REMOVED FROM   |  | DATE/TIME  |  | RECEIVED BY/STORED IN                   |  | DATE/TIME   |                |   |  |  |                        |
| RELINQUISHED BY/REMOVED FROM   |  | DATE/TIME  |  | RECEIVED BY/STORED IN                   |  | DATE/TIME   |                |   |  |  |                        |
| RELINQUISHED BY/REMOVED FROM   |  | DATE/TIME  |  | RECEIVED BY/STORED IN                   |  | DATE/TIME   |                |   |  |  |                        |
| <b>LABORATORY SECTION</b>  |  | <b>RECEIVED BY</b>   |  |   |  | <b>TITLE</b>  |                |   |  |  |                        |
| <b>FINAL SAMPLE DISPOSITION</b>  |  | <b>DISPOSAL METHOD</b>   |  |   |  | <b>DISPOSED BY</b>  |                |   |  |  |                        |
|  |  |  |  |   |  | <b>DATE/TIME</b>  |                |   |  |  |                        |
|  |  |  |  |   |  | <b>DATE/TIME</b>  |                |   |  |  |                        |

| CH2MHill Plateau Remediation Company   |   | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST                                       |                                   |   |                      | F10-023-003  | PAGE 1 OF 1 |  |                                     |
|--|---|--|-----------------------------------|---|----------------------|--|-------------|--|-------------------------------------|
| COLLECTOR<br><i>AL McIntyre</i>  |   | COMPANY CONTACT<br>WIDRIG, DL <i>HA152</i>                                     |                                   | TELEPHONE NO.<br>376-2858 <i>(7762)</i>   |                      | PROJECT COORDINATOR<br>WIDRIG, DL                        |             | PRICE CODE 7B                            | DATA TURNAROUND<br>7 Days / 15 Days |
| SAMPLING LOCATION<br>FTB   |   | PROJECT DESIGNATION<br>ARRA Upper & Lower ALE Building Science Laboratory - QC |                                   |   |                      | SAF NO.<br>F10-023                                       |             | AIR QUALITY <input type="checkbox"/>     |                                     |
| ICE CHEST NO.<br><i>GWS-121</i>  |   | FIELD LOGBOOK NO.<br><i>HNF-N-507-8</i>  |                                   | ACTUAL SAMPLE DEPTH   |                      | COA<br>302228E510  |             | METHOD OF SHIPMENT<br>GOVERNMENT VEHICLE |                                     |
| SHIPPED TO<br>Eberline Services  |   | OFFSITE PROPERTY NO.<br><i>00727</i>   |                                   |   |                      | BILL OF LADING/AIR BILL NO.<br><i>N/A 7883 6540 5740</i> |             |  |                                     |
| MATRIX*<br>A=Air<br>DL=Drum<br>L=Liquids<br>DS=Drum<br>Solids<br>L=Liquid<br>O=Oil<br>S=Soil<br>SE=Sediment<br>T=Tissue<br>V=Vegetation<br>W=Water<br>WI=Wipe<br>X=Other | POSSIBLE SAMPLE HAZARDS/ REMARKS<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) |  | PRESERVATION                      | HNO3 to pH <2   |                      |  |             |  |                                     |
|  |   |  | TYPE OF CONTAINER                 | G/P   |                      |  |             |  |                                     |
|  |   |  | NO. OF CONTAINER(S)               | 1   |                      |  |             |  |                                     |
|  |   |  | VOLUME                            | 1000mL  |                      |  |             |  |                                     |
|  | SPECIAL HANDLING AND/OR STORAGE   |  | SAMPLE ANALYSIS                   | Nickel-63;  |                      |  |             |  |                                     |
| SAMPLE NO.   | MATRIX*   | SAMPLE DATE  | SAMPLE TIME                       |   |                      |  |             |  |                                     |
| B23K51   | WATER   | 2/4/10   | 0800                              | ✓   |                      |  |             |  |                                     |
| CHAIN OF POSSESSION  |   | SIGN/ PRINT NAMES  |                                   |   | SPECIAL INSTRUCTIONS |  |             |  |                                     |
| RELINQUISHED BY/REMOVED FROM<br><i>AR McIntyre</i>   | DATE/TIME<br><i>2/4/10 1400</i>   | RECEIVED BY/STORED IN<br><i>Fed Ex</i>   | DATE/TIME                         |  |                      |  |             |  |                                     |
| RELINQUISHED BY/REMOVED FROM<br><i>Fed Ex</i>  | DATE/TIME   | RECEIVED BY/STORED IN<br><i>F. KATHAN</i>                                      | DATE/TIME<br><i>02/05/10 0915</i> |   |                      |  |             |  |                                     |
| RELINQUISHED BY/REMOVED FROM   | DATE/TIME   | RECEIVED BY/STORED IN  | DATE/TIME                         |   |                      |  |             |  |                                     |
| RELINQUISHED BY/REMOVED FROM   | DATE/TIME   | RECEIVED BY/STORED IN  | DATE/TIME                         |   |                      |  |             |  |                                     |
| RELINQUISHED BY/REMOVED FROM   | DATE/TIME   | RECEIVED BY/STORED IN  | DATE/TIME                         |   |                      |  |             |  |                                     |
| RELINQUISHED BY/REMOVED FROM   | DATE/TIME   | RECEIVED BY/STORED IN  | DATE/TIME                         |   |                      |  |             |  |                                     |
| LABORATORY SECTION   | RECEIVED BY   | TITLE  |                                   |   | DATE/TIME            |  |             |  |                                     |
| FINAL SAMPLE DISPOSITION   | DISPOSAL METHOD   | DISPOSED BY  |                                   |   | DATE/TIME            |  |             |  |                                     |

7762



# RICHMOND, CA LABORATORY

## SAMPLE RECEIPT CHECKLIST

Client: CHPRC City Richmond State WA  
 Date/Time received 07/05/10 0915 CoC No. Perkins F10-023-002,003  
 Container I.D. No. GWS-121 Requested TAT (Days) 7/15 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 \_\_\_\_\_
7. Number of containers per sample: 9 (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 1 / N/A Preservative HNO3
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>B23K51</u>       | <u>260</u>     |                   |      |                     |                |                   |      |
|                     |                |                   |      |                     |                |                   |      |
|                     |                |                   |      |                     |                |                   |      |
|                     |                |                   |      |                     |                |                   |      |
|                     |                |                   |      |                     |                |                   |      |
|                     |                |                   |      |                     |                |                   |      |
|                     |                |                   |      |                     |                |                   |      |
|                     |                |                   |      |                     |                |                   |      |
|                     |                |                   |      |                     |                |                   |      |

Ion Chamber Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_  
 Alpha Meter Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_  
 Beta/Gamma Meter Ser. No. 100482 Calibration date 05 AUG 09