



EBERLINE SERVICES

0079500

April 1, 2008

Mr. Steve Trent
Fluor Hanford Inc.
1200 Jadwin Avenue
Richland, WA 99352

Reference: **P.O. #33677**
Eberline Services R8-02-195-7045, SDG H3644



Dear Mr. Trent:

Enclosed is a data report for two water samples designated under SAF No. F08-037, received at Eberline Services on February 27, 2008. The samples were analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion
Senior Program Manager

MCM/njv

Enclosure: Data Package

RECEIVED
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EDMC

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

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1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H3644 was composed of two water samples designated under SAF No. F08-037 with a Project Designation of: 200-BP-5 OU Characterization for 299-E33-343-QC Sampling.

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

2.0 ANALYSIS NOTES

2.1 Carbon-14 Analysis

No problems were encountered during the course of the analyses.

2.2 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.3 Iodine-129 Analysis

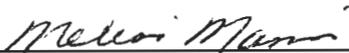
No problems were encountered during the course of the analyses.

2.4 Isotopic Thorium Analysis

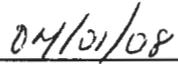
No problems were encountered during the course of the analyses.

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."



Melissa C. Mannion
Senior Program Manager



Date

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3644

SDG 7045
Contact Melissa C. Mannion

Client Hanford
Contract No. 33677
Case no SDG_H3644

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

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

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Prepared by

Melissa Mannion

Reviewed by

Melissa Mannion

Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 33677
Case no SDG_H3644

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
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Form DVD-RG
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 33677
Case no SDG H3644

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-RG
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045

Contact Melissa C. Mannion

LAB SAMPLE SUMMARY

Client Hanford

Contract No. 33677

Case no SDG H3644

| LAB | | | | | | CHAIN OF | |
|------------|------------------------|----------------|--------|-------|---------|-------------|----------------|
| SAMPLE ID | CLIENT SAMPLE ID | LOCATION | MATRIX | LEVEL | SAF NO | CUSTODY | COLLECTED |
| R802195-01 | B1T1T6 | I-118-EB C5858 | WATER | | F08-037 | F08-037-002 | 01/31/08 11:30 |
| R802195-02 | B1T1T7 | I-128-EB C5858 | WATER | | F08-037 | F08-037-04 | 02/20/08 06:00 |
| R802195-03 | Lab Control Sample | | WATER | | F08-037 | | |
| R802195-04 | Method Blank | | WATER | | F08-037 | | |
| R802195-05 | Duplicate (R802195-01) | I-118-EB C5858 | WATER | | F08-037 | | 01/31/08 11:30 |
| R802195-06 | Spike (R802195-02) | I-128-EB C5858 | WATER | | F08-037 | | 02/20/08 06:00 |

LAB SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol Fluor
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 Version 3.06
 Report date 04/01/08

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045

Contact Melissa C. Mannion

QC SUMMARY

Client Hanford

Contract No. 33677

Case no SDG H3644

| IC BATCH | CHAIN OF CUSTODY | CLIENT SAMPLE ID | MATRIX | % SOLIDS | SAMPLE AMOUNT | BASIS AMOUNT | DAYS SINCE RECEIVED | LAB COLL | LAB SAMPLE ID | DEPARTMENT SAMPLE ID |
|----------|------------------|------------------------|--------|----------|---------------|--------------|---------------------|----------|---------------|----------------------|
| 045 | F08-037-002 | B1T1T6 | WATER | | 6.0 L | | 08/27/08 209 | | R802195-01 | 7045-001 |
| | F08-037-04 | B1T1T7 | WATER | | 6.0 L | | 08/27/08 189 | | R802195-02 | 7045-002 |
| | | Method Blank | WATER | | | | | | R802195-04 | 7045-004 |
| | | Lab Control Sample | WATER | | | | | | R802195-03 | 7045-003 |
| | | Duplicate (R802195-01) | WATER | | 6.0 L | | 08/27/08 209 | | R802195-05 | 7045-005 |
| | | Spike (R802195-02) | WATER | | 6.0 L | | 08/27/08 189 | | R802195-06 | 7045-006 |

QC SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE
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 Form DVD-QS
 Version 3.06
 Report date 04/01/08

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
 Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
 Contract No. 33677
 Case no SDG H3644

| TEST | MATRIX | METHOD | PREPARATION ERROR | | PLANCHETS ANALYZED | | | | QUALI- | | |
|-------------------------------|--------|----------------------------|-------------------|------|--------------------|------|----|-------|--------|-----|----------|
| | | | BATCH | 2σ % | CLIENT | MORE | RE | BLANK | | LCS | DUP/ORIG |
| Alpha Spectroscopy | | | | | | | | | | | |
| TH | WATER | Thorium, Isotopic in Water | 6145-093 | 8.0 | 2 | | | 1 | 1 | 1/1 | |
| Gamma Spectroscopy | | | | | | | | | | | |
| I | WATER | Iodine 129 in Water | 6145-093 | 19.4 | 2 | | | 1 | 1 | 1/1 | |
| Liquid Scintillation Counting | | | | | | | | | | | |
| C | WATER | Carbon 14 in Water | 6145-093 | 10.0 | 2 | | | 1 | 1 | 1/1 | 1/1 X |
| NI_L | WATER | Nickel-63 in Liquid | 6145-093 | 11.2 | 2 | | | 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 Fluor
 Version Ver 1.0
 Form DVD-PBS
 Version 3.06
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045

Contact Melissa C. Mannion

Client Hanford

Contract No. 33677

Case no SDG H3644

LAB WORK SUMMARY

| LAB SAMPLE | CLIENT SAMPLE ID | | | | SUF- | | | | | |
|------------|------------------------|---------|----------|------|------|----------|----------|----|----------------------------|--|
| COLLECTED | LOCATION | MATRIX | | | FIX | ANALYZED | REVIEWED | BY | METHOD | |
| RECEIVED | CUSTODY | SAF No | PLANCHET | TEST | | | | | | |
| :802195-01 | B1T1T6 | | 7045-001 | C | | 03/24/08 | 03/26/08 | BW | Carbon 14 in Water | |
| 01/31/08 | I-118-EB C5858 | | 7045-001 | I | | 03/25/08 | 03/27/08 | BW | Iodine 129 in Water | |
| 08/27/08 | F08-037-002 | F08-037 | 7045-001 | NI_L | | 03/27/08 | 03/31/08 | BW | Nickel-63 in Liquid | |
| | | | 7045-001 | TH | | 03/26/08 | 03/26/08 | BW | Thorium, Isotopic in Water | |
| :802195-02 | B1T1T7 | | 7045-002 | C | | 03/24/08 | 03/26/08 | BW | Carbon 14 in Water | |
| 02/20/08 | I-128-EB C5858 | | 7045-002 | I | | 03/25/08 | 03/27/08 | BW | Iodine 129 in Water | |
| 08/27/08 | F08-037-04 | F08-037 | 7045-002 | NI_L | | 03/27/08 | 03/31/08 | BW | Nickel-63 in Liquid | |
| | | | 7045-002 | TH | | 03/26/08 | 03/26/08 | BW | Thorium, Isotopic in Water | |
| :802195-03 | Lab Control Sample | | 7045-003 | C | | 03/24/08 | 03/26/08 | BW | Carbon 14 in Water | |
| | | | 7045-003 | I | | 03/26/08 | 03/27/08 | BW | Iodine 129 in Water | |
| | | F08-037 | 7045-003 | NI_L | | 03/27/08 | 03/31/08 | BW | Nickel-63 in Liquid | |
| | | | 7045-003 | TH | | 03/26/08 | 03/26/08 | BW | Thorium, Isotopic in Water | |
| :802195-04 | Method Blank | | 7045-004 | C | | 03/24/08 | 03/26/08 | BW | Carbon 14 in Water | |
| | | | 7045-004 | I | | 03/26/08 | 03/27/08 | BW | Iodine 129 in Water | |
| | | F08-037 | 7045-004 | NI_L | | 03/27/08 | 03/31/08 | BW | Nickel-63 in Liquid | |
| | | | 7045-004 | TH | | 03/26/08 | 03/26/08 | BW | Thorium, Isotopic in Water | |
| :802195-05 | Duplicate (R802195-01) | | 7045-005 | C | | 03/24/08 | 03/26/08 | BW | Carbon 14 in Water | |
| 01/31/08 | I-118-EB C5858 | | 7045-005 | I | | 03/26/08 | 03/27/08 | BW | Iodine 129 in Water | |
| 08/27/08 | | F08-037 | 7045-005 | NI_L | | 03/27/08 | 03/31/08 | BW | Nickel-63 in Liquid | |
| | | | 7045-005 | TH | | 03/26/08 | 03/26/08 | BW | Thorium, Isotopic in Water | |
| :802195-06 | Spike (R802195-02) | | 7045-006 | C | | 03/24/08 | 03/26/08 | BW | Carbon 14 in Water | |
| 02/20/08 | I-128-EB C5858 | | | | | | | | | |
| 08/27/08 | | F08-037 | | | | | | | | |

WORK SUMMARY

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SUMMARY DATA SECTION

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045

Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford

Contract No. 33677

Case no SDG H3644

COUNTS OF TESTS BY SAMPLE TYPE

| TEST | SAF No | METHOD | REFERENCE | CLIENT | MORE | RE | BLANK | LCS | DUP SPIKE | TOTAL | |
|--------|---------|----------------------------|--------------------|--------|------|----|-------|-----|-----------|-------|----|
| C | F08-037 | Carbon 14 in Water | C14_CHEM_LSC | 2 | | | 1 | 1 | 1 | 1 | 6 |
| I | F08-037 | Iodine 129 in Water | I129_SEP_LEPS_GS | 2 | | | 1 | 1 | 1 | | 5 |
| NI_L | F08-037 | Nickel-63 in Liquid | NI63_LSC | 2 | | | 1 | 1 | 1 | | 5 |
| TH | F08-037 | Thorium, Isotopic in Water | THISO_IE_PLATE_AEA | 2 | | | 1 | 1 | 1 | | 5 |
| TOTALS | | | | 8 | | | 4 | 4 | 4 | 1 | 21 |

WORK SUMMARY

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Version Ver 1.0

Form DVD-LWS

Version 3.06

Report date 04/01/08

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EBERLINE SERVICES / RICHMOND
 SAMPLE DELIVERY GROUP H3644

7045-004

Method Blank

METHOD BLANK

| | | |
|-----------------------------------|--------------------------------------|------------------|
| SDG <u>7045</u> | Client/Case no <u>Hanford</u> | SDG <u>H3644</u> |
| Contact <u>Melissa C. Mannion</u> | Contract No. <u>33677</u> | |
| Lab sample id <u>R802195-04</u> | Client sample id <u>Method Blank</u> | |
| Dept sample id <u>7045-004</u> | Material/Matrix <u>WATER</u> | |
| | SAF No <u>F08-037</u> | |

| ANALYTE | CAS NO | RESULT pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI- FIERS | TEST |
|-------------|------------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Carbon 14 | 14762-75-5 | 18.5 | 35 | 58.9 | 200 | U | C |
| Nickel 63 | 13981-37-8 | -0.278 | 1.7 | 2.96 | 15.0 | U | NI_L |
| Thorium 228 | 14274-82-9 | 0 | 0.14 | 0.342 | | U | TH |
| Thorium 230 | 14269-63-7 | 0.142 | 0.14 | 0.272 | 1.00 | U | TH |
| Thorium 232 | TH-232 | 0 | 0.071 | 0.272 | 1.00 | U | TH |
| Iodine 129 | 15046-84-1 | 0.330 | 2.2 | 4.88 | 5.00 | U | I |

200BP5 OU Charctrztn299E33343QCsampl

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|-----------------|
| QC-BLANK #65011 |
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| Lab id <u>EBRLNE</u> |
| Protocol <u>Fluor</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-DS</u> |
| Version <u>3.06</u> |
| Report date <u>04/01/08</u> |

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3644

7045-003

Lab Control Sample

LAB CONTROL SAMPLE

| | | |
|-----------------------------------|--|------------------|
| SDG <u>7045</u> | Client/Case no <u>Hanford</u> | <u>SDG H3644</u> |
| Contact <u>Melissa C. Mannion</u> | Contract No. <u>33677</u> | |
| Lab sample id <u>R802195-03</u> | Client sample id <u>Lab Control Sample</u> | |
| Dept sample id <u>7045-003</u> | Material/Matrix <u>WATER</u> | |
| | SAF No <u>F08-037</u> | |

| ANALYTE | RESULT pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI- FIERS TEST | ADDED pCi/L | 2σ ERR pCi/L | REC % | 3σ LMITS (TOTAL) | PROTOCOL LIMITS |
|-------------|-----------------|-------------------|--------------|--------------|----------------------|----------------|-----------------|----------|---------------------|--------------------|
| Carbon 14 | 8000 | 280 | 134 | 200 | C | 7970 | 320 | 100 | 83-117 | 80-120 |
| Nickel 63 | 215 | 5.8 | 3.00 | 15.0 | NI_L | 222 | 8.9 | 97 | 82-118 | 80-120 |
| Thorium 230 | 16.8 | 2.9 | 0.390 | 1.00 | TH | 18.2 | 0.73 | 92 | 73-127 | 80-120 |
| Iodine 129 | 246 | 4.1 | <u>5.49</u> | 5.00 | I | 232 | 9.3 | 106 | 68-132 | 80-120 |

200BP5 OU Charctrztn299E33343QCsampl

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|---------------|
| QC-LCS #65010 |
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| Lab id <u>EBRLNE</u> |
| Protocol <u>Fluor</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-LCS</u> |
| Version <u>3.06</u> |
| Report date <u>04/01/08</u> |

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3644

7045-005

B1T1T6

DUPLICATE

| | | |
|-----------------------------------|---------------------------------|---|
| SDG <u>7045</u> | Client/Case no <u>Hanford</u> | <u>SDG H3644</u> |
| Contact <u>Melissa C. Mannion</u> | Contract No. <u>33677</u> | |
| DUPLICATE | ORIGINAL | |
| Lab sample id <u>R802195-05</u> | Lab sample id <u>R802195-01</u> | Client sample id <u>B1T1T6</u> |
| Dept sample id <u>7045-005</u> | Dept sample id <u>7045-001</u> | Location/Matrix <u>I-118-EB C5858</u> <u>WATER</u> |
| | Received <u>08/27/08</u> | Collected/Volume <u>01/31/08 11:30</u> <u>6.0 L</u> |
| | | Custody/SAF No <u>F08-037-002</u> <u>F08-037</u> |

| ANALYTE | DUPLICATE pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI- FIERS | TEST | ORIGINAL pCi/L | 2σ ERR (COUNT) | MDA pCi/L | QUALI- FIERS | RPD % | 3σ TOT | DER σ |
|-------------|--------------------|-------------------|--------------|--------------|-----------------|------|-------------------|-------------------|--------------|-----------------|----------|-----------|----------|
| Carbon 14 | -14.6 | 34 | 58.5 | 200 | U | C | 23.5 | 35 | 58.4 | U | - | 1.6 | |
| Nickel 63 | -1.21 | 1.7 | 2.95 | 15.0 | U | NI_L | -0.174 | 1.7 | 2.97 | U | - | 0.9 | |
| Thorium 228 | -0.034 | 0.14 | 0.374 | | U | TH | 0.141 | 0.23 | 0.346 | U | - | 1.3 | |
| Thorium 230 | 0.034 | 0.20 | 0.322 | 1.00 | U | TH | 0.140 | 0.17 | 0.214 | U | - | 0.8 | |
| Thorium 232 | 0 | 0.067 | 0.258 | 1.00 | U | TH | 0 | 0.056 | 0.214 | U | - | 0 | |
| Iodine 129 | <u>-2.76</u> | 2.6 | <u>5.91</u> | 5.00 | U | I | 0.550 | 1.9 | 4.19 | U | - | 2.0 | |

200BP5 OU Charctrztn299E33343QCsampl

QC-DUP#1 65012

DUPLICATES

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| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>Fluor</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-DUP</u> |
| Version <u>3.06</u> |
| Report date <u>04/01/08</u> |

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3644

7045-006

BIT1T7

MATRIX SPIKE

| | | |
|-----------------------------------|---------------------------------|---|
| SDG <u>7045</u> | Client/Case no <u>Hanford</u> | <u>SDG H3644</u> |
| Contact <u>Melissa C. Mannion</u> | Contract No. <u>33677</u> | |
| MATRIX SPIKE | ORIGINAL | |
| Lab sample id <u>R802195-06</u> | Lab sample id <u>R802195-02</u> | Client sample id <u>BIT1T7</u> |
| Dept sample id <u>7045-006</u> | Dept sample id <u>7045-002</u> | Location/Matrix <u>I-128-EB C5858</u> <u>WATER</u> |
| | Received <u>08/27/08</u> | Collected/Volume <u>02/20/08 06:00</u> <u>6.0 L</u> |
| | | Custody/SAF No <u>F08-037-04</u> <u>F08-037</u> |

| ANALYTE | SPIKE pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI- FIERS TEST | ADDED pCi/L | 2σ ERR pCi/L | ORIGINAL pCi/L | 2σ ERR (COUNT) | REC 3σ % (TOTAL) | LMTS (TOTAL) | PROTOCOL LIMITS |
|-----------|----------------|-------------------|--------------|--------------|----------------------|----------------|-----------------|-------------------|-------------------|---------------------|-----------------|--------------------|
| Carbon 14 | 24900 | 840 | <u>292</u> | 200 | X C | 23900 | 960 | -4.28 | 35 | 104 | 82-118 | 60-140 |

200BP5 OU Charctrztn299E33343QCsampl

QC-MS#2 65013

MATRIX SPIKES

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| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>Fluor</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-MS</u> |
| Version <u>3.06</u> |
| Report date <u>04/01/08</u> |

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3644

7045-001

B1T1T6

DATA SHEET

| | | |
|-----------------------------------|--|------------------|
| SDG <u>7045</u> | Client/Case no <u>Hanford</u> | SDG <u>H3644</u> |
| Contact <u>Melissa C. Mannion</u> | Contract No. <u>33677</u> | |
| Lab sample id <u>R802195-01</u> | Client sample id <u>B1T1T6</u> | |
| Dept sample id <u>7045-001</u> | Location/Matrix <u>I-118-EB C5858</u> | <u>WATER</u> |
| Received <u>08/27/08</u> | Collected/Volume <u>01/31/08 11:30</u> | <u>6.0 L</u> |
| | Custody/SAF No <u>F08-037-002</u> | <u>F08-037</u> |

| ANALYTE | CAS NO | RESULT pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI- FIERS | TEST |
|-------------|------------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Carbon 14 | 14762-75-5 | 23.5 | 35 | 58.4 | 200 | U | C |
| Nickel 63 | 13981-37-8 | -0.174 | 1.7 | 2.97 | 15.0 | U | NI_L |
| Thorium 228 | 14274-82-9 | 0.141 | 0.23 | 0.346 | | U | TH |
| Thorium 230 | 14269-63-7 | 0.140 | 0.17 | 0.214 | 1.00 | U | TH |
| Thorium 232 | TH-232 | 0 | 0.056 | 0.214 | 1.00 | U | TH |
| Iodine 129 | 15046-84-1 | 0.550 | 1.9 | 4.19 | 5.00 | U | I |

200BP5 OU Charctrztn299E33343QCsampl

DATA SHEETS

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SUMMARY DATA SECTION

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| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>Fluor</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-DS</u> |
| Version <u>3.06</u> |
| Report date <u>04/01/08</u> |

00000015

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3644

7045-002

B1T1T7

DATA SHEET

| | | |
|-----------------------------------|--|------------------|
| SDG <u>7045</u> | Client/Case no <u>Hanford</u> | SDG <u>H3644</u> |
| Contact <u>Melissa C. Mannion</u> | Contract No. <u>33677</u> | |
| Lab sample id <u>R802195-02</u> | Client sample id <u>B1T1T7</u> | |
| Dept sample id <u>7045-002</u> | Location/Matrix <u>I-128-EB_C5858</u> | <u>WATER</u> |
| Received <u>08/27/08</u> | Collected/Volume <u>02/20/08 06:00</u> | <u>5.0 L</u> |
| | Custody/SAF No <u>F08-037-04</u> | <u>F08-037</u> |

| ANALYTE | CAS NO | RESULT pCi/L | 2σ ERR (COUNT) | MDA pCi/L | RDL pCi/L | QUALI- FIERS | TEST |
|-------------|------------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Carbon 14 | 14762-75-5 | -4.28 | 35 | 59.1 | 200 | U | C |
| Nickel 63 | 13981-37-8 | -0.458 | 1.7 | 3.00 | 15.0 | U | NI_L |
| Thorium 228 | 14274-82-9 | -0.033 | 0.13 | 0.361 | | U | TH |
| Thorium 230 | 14269-63-7 | 0.228 | 0.20 | 0.249 | 1.00 | U | TH |
| Thorium 232 | TH-232 | 0.033 | 0.065 | 0.249 | 1.00 | U | TH |
| Iodine 129 | 15046-84-1 | -0.842 | 1.3 | 2.97 | 5.00 | U | I |

200BP5 OU Charctrztn299E33343QCsampl

DATA SHEETS

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SUMMARY DATA SECTION

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| |
|-----------------------------|
| Lab id <u>EBRLNE</u> |
| Protocol <u>Fluor</u> |
| Version <u>Ver 1.0</u> |
| Form <u>DVD-DS</u> |
| Version <u>3.06</u> |
| Report date <u>04/01/08</u> |

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3644

Client Hanford
 Contract No. 33677
 Contract SDG H3644

Test TH Matrix WATER
 SDG 7045
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN WATER
 ALPHA SPECTROSCOPY

RESULTS

| LAB | RAW | SUF- | CLIENT SAMPLE ID | Thorium 230 |
|----------------------------|----------|------------------------|------------------|-------------|
| SAMPLE ID | TEST FIX | PLANCHET | | |
| Preparation batch 6145-093 | | | | |
| 802195-01 | 7045-001 | B1T1T6 | | U |
| 802195-02 | 7045-002 | B1T1T7 | | U |
| 802195-03 | 7045-003 | Lab Control Sample | | ok |
| 802195-04 | 7045-004 | Method Blank | | U |
| 802195-05 | 7045-005 | Duplicate (R802195-01) | | - U |

nominal values and limits from method RDLs (pCi/L) 1.00
 00BP5 OU Charctrztn299E33343QCsampl

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 6145-093 | | | 2σ prep error 8.0 % | | | Reference Lab Notebook #6145, pg. 93 | | | | | | | | | |
| 802195-01 | | B1T1T6 | 0.214 | 0.500 | | | 49 | | 164 | | | 55 | 03/25/08 | 03/26 | SS-027 |
| 802195-02 | | B1T1T7 | 0.249 | 0.500 | | | 48 | | 164 | | | 35 | 03/25/08 | 03/26 | SS-028 |
| 802195-03 | | Lab Control Sample | 0.390 | 0.500 | | | 34 | | 164 | | | | 03/25/08 | 03/26 | SS-031 |
| 802195-04 | | Method Blank | 0.272 | 0.500 | | | 46 | | 165 | | | | 03/25/08 | 03/26 | SS-032 |
| 802195-05 | | Duplicate (R802195-01) | 0.322 | 0.500 | | | 42 | | 165 | | | 55 | 03/25/08 | 03/26 | SS-033 |

nominal values and limits from method 1.00 0.500 20-110 150 100 180

| PROCEDURES | REFERENCE | THISO_IE_PLATE_AEA |
|------------|--|--------------------|
| SPP-062 | Sample Aliquoting, rev 0 | |
| SPP-040 | Environmental Water Dissolution, rev 0 | |
| CP-900 | Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 1 | |
| CP-008 | Heavy Element Electroplating, rev 9 | |

AVERAGES ± 2 SD MDA 0.289 ± 0.137
 FOR 5 SAMPLES YIELD 44 ± 12

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol Fluor
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 04/01/08

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3644

Test I Matrix WATER
 SDG 7045
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

IODINE 129 IN WATER
 GAMMA SPECTROSCOPY

Client Hanford
 Contract No. 33677
 Contract SDG H3644

RESULTS

| LAB | RAW | SUF- | CLIENT SAMPLE ID | Iodine 129 |
|----------------------------|----------|----------|------------------------|------------|
| SAMPLE ID | TEST FIX | PLANCHET | | |
| Preparation batch 6145-093 | | | | |
| 802195-01 | | 7045-001 | B1T1T6 | U |
| 802195-02 | | 7045-002 | B1T1T7 | U |
| 802195-03 | | 7045-003 | Lab Control Sample | ok |
| 802195-04 | | 7045-004 | Method Blank | U |
| 802195-05 | | 7045-005 | Duplicate (R802195-01) | - U |

nominal values and limits from method RDLs (pCi/L) 5.00
 00BP5 OU Charctrztn299E33343QCsampl

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 6145-093 2σ prep error 19.4 % Reference Lab Notebook #6145, pg. 93 | | | | | | | | | | | | | | | |
| 802195-01 | | B1T1T6 | 4.19 | 0.500 | | | 41 | | 733 | | | 54 | 03/24/08 | 03/25 | XSPEC-002 |
| 802195-02 | | B1T1T7 | 2.97 | 0.500 | | | 57 | | 732 | | | 34 | 03/24/08 | 03/25 | XSPEC-004 |
| 802195-03 | | Lab Control Sample | <u>5.49</u> | 0.500 | | | 51 | | 639 | | | | 03/24/08 | 03/26 | XSPEC-004 |
| 802195-04 | | Method Blank | 4.88 | 0.500 | | | 40 | | 639 | | | | 03/24/08 | 03/26 | XSPEC-002 |
| 802195-05 | | Duplicate (R802195-01) | <u>5.91</u> | 0.500 | | | 31 | | 786 | | | 55 | 03/24/08 | 03/26 | XSPEC-004 |

nominal values and limits from method 5.00 0.500 20-105 300 100 180

PROCEDURES REFERENCE I129_SEP_LEPS_GS
 SPP-062 Sample Aliquoting, rev 0
 CP-531 Iodine-129, 131 in Water, Large Aliquots, rev 1

AVERAGES ± 2 SD MDA 4.69 ± 2.32
 FOR 5 SAMPLES YIELD 44 ± 20

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol Fluor
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 04/01/08

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3644

LAB METHOD SUMMARY

CARBON 14 IN WATER

LIQUID SCINTILLATION COUNTING

Test C Matrix WATER
 SDG 7045
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 33677
 Contract SDG H3644

RESULTS

| LAB | RAW | SUF- | CLIENT SAMPLE ID | Carbon 14 |
|----------------------------|----------|------|------------------------|-----------|
| Preparation batch 6145-093 | | | | |
| 802195-01 | 7045-001 | | B1T1T6 | U |
| 802195-02 | 7045-002 | | B1T1T7 | U |
| 802195-03 | 7045-003 | | Lab Control Sample | ok |
| 802195-04 | 7045-004 | | Method Blank | U |
| 802195-05 | 7045-005 | | Duplicate (R802195-01) | - U |
| 802195-06 | 7045-006 | | Spike (R802195-02) | ok X |

Nominal values and limits from method RDLs (pCi/L) 200
 00BP5 OU Charctrztn299E33343QCsampl

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 6145-093 2σ prep error 10.0 % Reference Lab Notebook #6145, pg. 93 | | | | | | | | | | | | | | | |
| 802195-01 | | B1T1T6 | 58.4 | 0.0300 | | | 100 | | 50 | | 53 | 03/24/08 | 03/24 | LSC-004 | |
| 802195-02 | | B1T1T7 | 59.1 | 0.0300 | | | 100 | | 50 | | 33 | 03/24/08 | 03/24 | LSC-004 | |
| 802195-03 | | Lab Control Sample | 134 | 0.0300 | | | 100 | | 10 | | | 03/24/08 | 03/24 | LSC-004 | |
| 802195-04 | | Method Blank | 58.9 | 0.0300 | | | 100 | | 50 | | | 03/24/08 | 03/24 | LSC-004 | |
| 802195-05 | | Duplicate (R802195-01) | 58.5 | 0.0300 | | | 100 | | 50 | | 53 | 03/24/08 | 03/24 | LSC-004 | |
| 802195-06 | | Spike (R802195-02) | 292 | 0.0200 | | | 100 | | 5 | | 33 | 03/24/08 | 03/24 | LSC-004 | |

Nominal values and limits from method 200 0.0300 50 180

PROCEDURES REFERENCE C14_CHEM_LSC
 CP-241 Carbon-14 in Aqueous Samples, rev 6

AVERAGES ± 2 SD MDA 110 ± 188
 FOR 6 SAMPLES YIELD 100 ± 0

Lab id EBRLNE
 Protocol Fluor
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 04/01/08

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3644

| | |
|----------|------------------|
| Client | <u>Hanford</u> |
| Contract | <u>No. 33677</u> |
| Contract | <u>SDG H3644</u> |

LAB METHOD SUMMARY

NICKEL-63 IN LIQUID

LIQUID SCINTILLATION COUNTING

| | |
|---------|---------------------------|
| Test | <u>NI L Matrix WATER</u> |
| SDG | <u>7045</u> |
| Contact | <u>Melissa C. Mannion</u> |

RESULTS

| LAB | RAW | SUF- | CLIENT SAMPLE ID | Nickel 63 |
|----------------------------|----------|------------------------|------------------|-----------|
| Preparation batch 6145-093 | | | | |
| 802195-01 | 7045-001 | B1T1T6 | | U |
| 802195-02 | 7045-002 | B1T1T7 | | U |
| 802195-03 | 7045-003 | Lab Control Sample | | ok |
| 802195-04 | 7045-004 | Method Blank | | U |
| 802195-05 | 7045-005 | Duplicate (R802195-01) | | - U |

Nominal values and limits from method RDLs (pCi/L) 15.0
 00BP5 OU Charctrztn299E33343QCsampl

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 6145-093 2σ prep error 11.2 % Reference Lab Notebook #6145, pg. 93 | | | | | | | | | | | | | |
| 802195-01 | | B1T1T6 | 2.97 | 0.500 | | | 96 | | 50 | | 56 | 03/27/08 03/27 | LSC-004 |
| 802195-02 | | B1T1T7 | 3.00 | 0.500 | | | 96 | | 50 | | 36 | 03/27/08 03/27 | LSC-004 |
| 802195-03 | | Lab Control Sample | 3.00 | 0.500 | | | 95 | | 50 | | | 03/27/08 03/27 | LSC-004 |
| 802195-04 | | Method Blank | 2.96 | 0.500 | | | 96 | | 50 | | | 03/27/08 03/27 | LSC-004 |
| 802195-05 | | Duplicate (R802195-01) | 2.95 | 0.500 | | | 96 | | 50 | | 56 | 03/27/08 03/27 | LSC-004 |

Nominal values and limits from method 15.0 0.500 50 180

| | | |
|------------|-----------|--|
| PROCEDURES | REFERENCE | NI63_LSC |
| | SPP-040 | Environmetnal Water Dissolution, rev 0 |
| | CP-280 | Nickel-63 Purification, rev 3 |

| | | |
|-----------------|-------|----------------------------|
| AVERAGES ± 2 SD | MDA | <u>2.98</u> ± <u>0.046</u> |
| FOR 5 SAMPLES | YIELD | <u>96</u> ± <u>1</u> |

METHOD SUMMARIES

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SUMMARY DATA SECTION

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| | |
|-------------|-----------------|
| Lab id | <u>EBRLNE</u> |
| Protocol | <u>Fluor</u> |
| Version | <u>Ver 1.0</u> |
| Form | <u>DVD-LMS</u> |
| Version | <u>3.06</u> |
| Report date | <u>04/01/08</u> |

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 33677
 Case no SDG H3644

SAMPLE SUMMARY

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

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

The following notes apply to these reports:

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

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

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

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol Fluor
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 33677
 Case no SDG H3644

PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

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

These qualifiers should be reviewed as follows:

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

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

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol Fluor
 Version Ver 1.0
 Form DVD-RG
 Version 3.05
 Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 33677
 Case no SDG_H3644

WORK SUMMARY

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

The following notes apply to this report:

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

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol Fluor
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045

Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford

Contract No. 33677

Case no SDG H3644

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

Protocol Fluor

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
 Contract No. 33677
 Case no SDG H3644

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRINE
 Protocol Fluor
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 33677
Case no SDG H3644

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045

Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford

Contract No. 33677

Case no SDG_H3644

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE

Protocol Fluor

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 33677
Case no SDG H3644

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 33677
Case no SDG_H3644

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/01/08

00000029

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 33677
 Case no SDG H3644

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

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol Fluor
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 33677
Case no SDG H3644

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol Fluor
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045

Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford

Contract No. 33677

Case no SDG H3644

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'

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol Fluor
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
 Contract No. 33677
 Case no SDG H3644

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.

REPORT GUIDES

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SUMMARY DATA SECTION

Page 30

Lab id EBRINE
 Protocol Fluor
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 33677
Case no SDG H3644

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
Protocol Fluor
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/01/08

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3644

SDG 7045
Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford
Contract No. 33677
Case no SDG_H3644

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 Fluor
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 04/01/08

00000035

COLLECTOR
NCO Sampler **M. A. White**

COMPANY CONTACT
TRENT, SJ

TELEPHONE NO.
373-5869

PROJECT COORDINATOR
TRENT, SJ

PRICE CODE 7N

DATA
TURNAROUND

SAMPLING LOCATION
I-118-EB **C5858**

PROJECT DESIGNATION
200-BP-5 OU Characterization for 299-E33-343 - QC Sampling
H3644 (7045)

SAF NO.
F08-037

AIR QUALITY

45 Days / 45
Days

ICE CHEST NO.
GRP-03-004

FIELD LOGBOOK NO. ACTUAL SAMPLE DEPTH

COA
123511ES10

METHOD OF SHIPMENT
FEDERAL EXPRESS

SHIPPED TO
Eberline Services

OFFSITE PROPERTY NO.
See PTR

BILL OF LADING/AIR BILL NO.
See PTR
7998-0851-5552

MATRIX* **POSSIBLE SAMPLE HAZARDS/ REMARKS**
A=Air Contains Radioactive Material at concentrations
DL=Drum that are not regulated for transportation per 49
Liquids CFR but are not releasable per DOE Order
DS=Drum 5400.5 (1990/1993)
Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

SPECIAL HANDLING AND/OR STORAGE
Radioactive tie to B1 f1L4

| PRESERVATION | None | None | HNO3 to pH <2 | HNO3 to pH <2 |
|---------------------|------------|-------------|--------------------------------------|---------------|
| TYPE OF CONTAINER | G/P | G/P | G/P | G/P |
| NO. OF CONTAINER(S) | 1 | 4 | 1 | 1 |
| VOLUME | 125mL | 1000mL | 1000mL | 1000mL |
| SAMPLE ANALYSIS | Carbon-14; | Iodine-129; | SEE ITEM (1) IN SPECIAL INSTRUCTIONS | Nickel-63; |

| SAMPLE NO. | MATRIX* | SAMPLE DATE | SAMPLE TIME | | | | |
|------------|---------|-------------|-------------|---|---|---|---|
| B1T1T6 | WATER | 1-31-08 | 1130am | ✓ | ✓ | ✓ | ✓ |

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM **M. A. White** DATE/TIME **1-31-08 1230**

RELINQUISHED BY/REMOVED FROM **MO 745 Ref #1** DATE/TIME **2-26-08 / 0902**

RELINQUISHED BY/REMOVED FROM **Du Webb/Den Webb** DATE/TIME **2-26-08 / 0902**

RELINQUISHED BY/REMOVED FROM **FED EX** DATE/TIME

RELINQUISHED BY/REMOVED FROM DATE/TIME

RELINQUISHED BY/REMOVED FROM DATE/TIME

RELINQUISHED BY/REMOVED FROM DATE/TIME

SIGN/ PRINT NAMES

RECEIVED BY/STORED IN **MO 745** DATE/TIME **1-31-08 1230**

RECEIVED BY/STORED IN **Du Webb/Den Webb** DATE/TIME **2-26-08 / 0902**

RECEIVED BY/STORED IN **FEDEX** DATE/TIME

RECEIVED BY/STORED IN **Alex Keene** DATE/TIME **2/27/08 10:00**

RECEIVED BY/STORED IN DATE/TIME

RECEIVED BY/STORED IN DATE/TIME

RECEIVED BY/STORED IN DATE/TIME

SPECIAL INSTRUCTIONS

(1)Isotopic Thorium {Thorium-228, Thorium-230, Thorium-232}

000000036

LABORATORY SECTION RECEIVED BY
FINAL SAMPLE DISPOSITION DISPOSAL METHOD

TITLE DATE/TIME
DISPOSED BY DATE/TIME

COLLECTOR

NCO Sampler

COMPANY CONTACT

TRENT, SJ

TELEPHONE NO.

373-5869

PROJECT COORDINATOR

TRENT, SJ

PRICE CODE

7N

DATA TURNAROUND

45 Days / 45 Days

SAMPLING LOCATION

I-128-EB C5858

PROJECT DESIGNATION

200-BP-5 OU Characterization for 299-E33-343 - QC Sampling

H3644 (7045)

SAF NO.

F08-037

AIR QUALITY

ICE CHEST NO.

GWO-07-008

FIELD LOGBOOK NO.

HNF-N-503-1+2

ACTUAL SAMPLE DEPTH

COA

123511ES10

METHOD OF SHIPMENT

FEDERAL EXPRESS

SHIPPED TO

Eberline Services

OFFSITE PROPERTY NO.

See PTR

BILL OF LADING/AIR BILL NO.

See PTR

7904 5585 0527

MATRIX* POSSIBLE SAMPLE HAZARDS/ REMARKS

A=Air Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/1993)

DL=Drum Liquids

DS=Drum Solids

L=Liquid

O=Oil

S=Soil

SE=Sediment

T=Tissue

V=Vegetation

W=Water

WI=Wipe

X=Other

PRESERVATION

| | | | |
|------|------|---------------|---------------|
| None | None | HNO3 to pH <2 | HNO3 to pH <2 |
|------|------|---------------|---------------|

TYPE OF CONTAINER

| | | | |
|-----|-----|-----|-----|
| G/P | G/P | G/P | G/P |
|-----|-----|-----|-----|

NO. OF CONTAINER(S)

| | | | |
|---|---|---|---|
| 1 | 4 | 1 | 1 |
|---|---|---|---|

VOLUME

| | | | |
|-------|--------|--------|--------|
| 125mL | 1000mL | 1000mL | 1000mL |
|-------|--------|--------|--------|

SAMPLE ANALYSIS

| | | | |
|------------|-------------|--------------------------------------|------------|
| Carbon-14; | Iodine-129; | SEE ITEM (1) IN SPECIAL INSTRUCTIONS | Nickel-63; |
|------------|-------------|--------------------------------------|------------|

SPECIAL HANDLING AND/OR STORAGE

Radioactive tie to B1T1L5

SAMPLE NO.

MATRIX*

SAMPLE DATE

SAMPLE TIME

B1T1T7

WATER

2/20/08 0600

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
|---|---|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

CHAIN OF POSSESSION

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS

RELINQUISHED BY/REMOVED FROM

DATE/TIME

RECEIVED BY/STORED IN

DATE/TIME

KJ. Young 2/20/08 0900

MO-745 Ref #1 2/20/08 0900

RELINQUISHED BY/REMOVED FROM

DATE/TIME

RECEIVED BY/STORED IN

DATE/TIME

MO 745 Ref #1 2-26-08

D. Parcher 2-26-08

2-26-08

RELINQUISHED BY/REMOVED FROM

DATE/TIME

RECEIVED BY/STORED IN

DATE/TIME

D. Parcher 2-26-08

Fed EX 2/27/08

10:00

RELINQUISHED BY/REMOVED FROM

DATE/TIME

RECEIVED BY/STORED IN

DATE/TIME

FED EX

flex 2/27/08

10:00

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

00000057



RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: FLUOR HANFORD City RICHLAND State WA

Date/Time received 2/27/08 10:00 CoC No. FD8-037-002,004

Container I.D. No. SRP0304 Requested TAT (Days) 45 P.O. Received Yes [] No []

INSPECTION

- 1. Custody seals on shipping container intact? Yes [] No [] N/A []
- 2. Custody seals on shipping container dated & signed? Yes [] No [] N/A []
- 3. Custody seals on sample containers intact? Yes [] No [] N/A []
- 4. Custody seals on sample containers dated & signed? Yes [] No [] N/A []
- 5. Packing material is: Wet [] Dry [] N/A []
- 6. Number of samples in shipping container: 2 Sample Matrix WATER
- 7. Number of containers per sample: 7 (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 2.6 Preservative _____
- 13. Describe any anomalies: 2 x 1.0L 4 x 1.0L 1 x 0.2L

14. Was P.M. notified of any anomalies? Yes [] No [] Date _____

15. Inspected by JK Date 2/27/08 Time 12:30

| Customer Sample No. | Beta/Gamma cpm | Ion Chamber mR/hr | Wipe | Customer Sample No. | Beta/Gamma cpm | Ion Chamber mR/hr | wipe |
|---------------------|----------------|-------------------|------|---------------------|----------------|-------------------|------|
| <u>All Sample</u> | <u><60</u> | | | | | | |
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Ion Chamber Ser. No. _____
 Alpha Meter Ser. No. _____
 Beta/Gamma Meter Ser. No. 100482

Calibration date _____
 Calibration date _____
 Calibration date 9 May 2007