0078868

# SAF-RC-088
# 618-7 Burial Ground – Other Liquids
# FINAL DATA PACKAGE

**COMPLETE COPY OF DATA PACKAGE TO:**

| | | |
|---|---|---|
| Rick Kerkow | L6-06 | KW 10/2/08<br>Initials/Date |
| Kathy Wendt | H4-21 | KW 10/2/08<br>Initials/Date |

**COMMENTS:**

**SDG K1322 SAF-RC-088**

Rad only Chem only X Rad & Chem

X Complete Partial

**WASTE SITE: 618-7 Burial Ground (drums)**

RECEIVED
OCT 08 2008
EDMC

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
2030 Wright Avenue
Richmond, California 94804-3849
Phone (510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

September 23, 2008

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

RECEIVED
SEP 2008

Reference: **P.O. #S00W235A00**
**Eberline Services R8-09-051-7884, SDG K1322**

Dear Ms. Kessner:

Enclosed is the data report for three solid (other solid) samples designated under SAF No. RC-088 received at Eberline Services on September 5, 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 Mannion

Melissa C. Mannion
Senior Program Manager

*MCM/njv*

*Enclosure: Data Package*

## 1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K1322 was composed of three solid (other solid) sample designated under SAF No. RC-088 with a Project Designation of: 618-7 Burial Ground-Other Solid.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on September 23, 2008.

## 2.0 ANALYSIS NOTES

### 2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

### 2.2 Total Strontium Analysis

No problems were encountered during the course of the analyses.

### 2.3 Isotopic Thorium Analysis

No problems were encountered during the course of the analyses.

### 2.4 Isotopic Uranium Analysis

The U-232 tracer yields for sample J178L6-A, and the QC LCS were 109% and 107% respectively, greater than the upper control limit of 105%. No other problems were encountered during the course of the analyses.

### 2.5 Isotopic Plutonium Analysis

No problems were encountered during the course of the analyses.

### 2.6 Americium-241 Analysis

No problems were encountered during the course of the analyses.

### 2.7 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

## 3.0 Case Narrative Certification Statement

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

Melissa Mannion

**Melissa C. Mannion**
**Senior Program Manager**

09/23/8

**Date**

# EBERLINE SERVICES/RICHMOND
## SAMPLE DELIVERY GROUP K1322

| | |
|---|---|
| SDG | 7884 |
| Contact | Melissa C. Mannion |

| | |
|---|---|
| Client | Hanford |
| Contract | No. S00W235A00 |
| Case no | SDG_K1322 |

## SUMMARY DATA SECTION

### TABLE OF CONTENTS


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Prepared by

Melissa Mannion

Reviewed by

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-TOC |
| Version | 3.06 |
| Report date | 09/22/08 |

SDG 7884
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

# 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/22/08

# ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

## LAB SAMPLE SUMMARY

SDG 7884
ontact Melissa C. Mannion

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

| 3 MPLE ID | CLIENT SAMPLE ID | LOCATION | MATRIX | LEVEL | SAF NO | CHAIN OF CUSTODY | COLLECTED |
|---|---|---|---|---|---|---|---|
| )9051-01 | J178L4-A | 618-7 Burial Grnd(drums) | SOLID | | RC-088 | RC-088-062 | 08/18/08 09:00 |
| )9051-02 | J178L5-A | 618-7 Burial Grnd(drums) | SOLID | | RC-088 | RC-088-062 | 08/18/08 09:15 |
| )9051-03 | J178L6-A | 618-7 Burial Grnd(drums) | SOLID | | RC-088 | RC-088-062 | 08/18/08 09:40 |
| )9051-04 | Lab Control Sample | | SOLID | | RC-088 | | |
| )9051-05 | Method Blank | | SOLID | | RC-088 | | |
| 9051-06 | Duplicate (R809051-02) | 618-7 Burial Grnd(drums) | SOLID | | RC-088 | | 08/18/08 09:15 |
| 9051-07 | Duplicate (R809051-02) | 618-7 Burial Grnd(drums) | SOLID | | RC-088 | | 08/18/08 09:15 |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 09/22/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

SDG 7884
ontact Melissa C. Mannion

## QC SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

| ATCH | CHAIN OF CUSTODY | CLIENT SAMPLE ID | MATRIX | % SOLIDS | SAMPLE AMOUNT | BASIS AMOUNT | DAYS SINCE RECEIVED | DAYS SINCE COLL | LAB SAMPLE ID | DEPARTMENT SAMPLE ID |
|---|---|---|---|---|---|---|---|---|---|---|
| | RC-088-062 | J178L4-A | SOLID | 100.0 | 3.40 g | | 09/05/08 | 18 | R809051-01 | 7884-001 |
| | | J178L5-A | SOLID | 100.0 | 4.62 g | | 09/05/08 | 18 | R809051-02 | 7884-002 |
| | | J178L6-A | SOLID | 100.0 | 3.17 g | | 09/05/08 | 18 | R809051-03 | 7884-003 |
| | | Method Blank | SOLID | | | | | | R809051-05 | 7884-005 |
| | | Lab Control Sample | SOLID | | | | | | R809051-04 | 7884-004 |
| | | Duplicate (R809051-02) | SOLID | 100.0 | 4.62 g | | 09/05/08 | 18 | R809051-06 | 7884-006 |
| | | Duplicate (R809051-02) | SOLID | 100.0 | 4.62 g | | 09/05/08 | 18 | R809051-07 | 7884-007 |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 09/22/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

SDG 7884
Contact Melissa C. Mannion

## PREP BATCH SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

| TEST | MATRIX | METHOD | PREPARATION BATCH | ERROR 2σ % | PLANCHETS ANALYZED CLIENT | MORE | RE | BLANK | LCS | DUP/ORIG | MS/ORIG | QUALIFIERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alpha Spectroscopy** | | | | | | | | | | | | |
| AM | SOLID | Americium 241 in Solids | 6160-128 | 8.0 | 3 | | | 1 | 1 | 1/1 | | |
| PU | SOLID | Plutonium, Isotopic in Solids | 6160-128 | 8.0 | 3 | | | 1 | 1 | 1/1 | | |
| TH | SOLID | Thorium, Isotopic in Solids | 6160-128 | 8.0 | 3 | | | 1 | 1 | 1/1 | | |
| U | SOLID | Uranium, Isotopic in Solids | 6160-128 | 8.0 | 3 | | | 1 | 1 | 1/1 | | |
| **Beta Counting** | | | | | | | | | | | | |
| SR | SOLID | Total Strontium in Solids | 6160-128 | 10.4 | 3 | | | 1 | 1 | 1/1 | | |
| **Gas Proportional Counting** | | | | | | | | | | | | |
| 93A | SOLID | Gross Alpha in Solids | 6160-128 | 20.6 | 3 | | | 1 | 1 | 1/1 | | |
| 93B | SOLID | Gross Beta in Solids | 6160-128 | 11.0 | 3 | | | 1 | 1 | 1/1 | | |
| **Gamma Spectroscopy** | | | | | | | | | | | | |
| GAM | SOLID | Gamma Scan | 6160-128 | 7.0 | 3 | | | 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 Hanford1
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 09/22/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

SDG 7884
ntact Melissa C. Mannion

## LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

| AMPLE LECTED CEIVED | CLIENT SAMPLE ID LOCATION CUSTODY | SAF No | MATRIX | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| 51-01 | J178L4-A | | | 7884-001 | 93A/93 | | 09/16/08 | 09/16/08 | BW | Gross Alpha in Solids |
| /18/08 | 618-7 Burial Grnd(drums) | | SOLID | 7884-001 | 93B/93 | | 09/16/08 | 09/16/08 | BW | Gross Beta in Solids |
| /05/08 | RC-088-062 | RC-088 | | 7884-001 | AM | | 09/18/08 | 09/22/08 | BW | Americium 241 in Solids |
| | | | | 7884-001 | GAM | | 09/14/08 | 09/17/08 | CSS | Gamma Scan |
| | | | | 7884-001 | PU | | 09/18/08 | 09/22/08 | BW | Plutonium, Isotopic in Solids |
| | | | | 7884-001 | SR | | 09/10/08 | 09/15/08 | BW | Total Strontium in Solids |
| | | | | 7884-001 | TH | | 09/11/08 | 09/15/08 | BW | Thorium, Isotopic in Solids |
| | | | | 7884-001 | U | | 09/10/08 | 09/12/08 | BW | Uranium, Isotopic in Solids |
| 51-02 | J178L5-A | | | 7884-002 | 93A/93 | | 09/16/08 | 09/16/08 | BW | Gross Alpha in Solids |
| /18/08 | 618-7 Burial Grnd(drums) | | SOLID | 7884-002 | 93B/93 | | 09/16/08 | 09/16/08 | BW | Gross Beta in Solids |
| /05/08 | RC-088-062 | RC-088 | | 7884-002 | AM | | 09/19/08 | 09/22/08 | BW | Americium 241 in Solids |
| | | | | 7884-002 | GAM | | 09/14/08 | 09/17/08 | CSS | Gamma Scan |
| | | | | 7884-002 | PU | | 09/18/08 | 09/22/08 | BW | Plutonium, Isotopic in Solids |
| | | | | 7884-002 | SR | | 09/10/08 | 09/15/08 | BW | Total Strontium in Solids |
| | | | | 7884-002 | TH | | 09/11/08 | 09/15/08 | BW | Thorium, Isotopic in Solids |
| | | | | 7884-002 | U | | 09/10/08 | 09/12/08 | BW | Uranium, Isotopic in Solids |
| 51-03 | J178L6-A | | | 7884-003 | 93A/93 | | 09/16/08 | 09/16/08 | BW | Gross Alpha in Solids |
| /18/08 | 618-7 Burial Grnd(drums) | | SOLID | 7884-003 | 93B/93 | | 09/16/08 | 09/16/08 | BW | Gross Beta in Solids |
| /05/08 | RC-088-062 | RC-088 | | 7884-003 | AM | | 09/18/08 | 09/22/08 | BW | Americium 241 in Solids |
| | | | | 7884-003 | GAM | | 09/16/08 | 09/17/08 | CSS | Gamma Scan |
| | | | | 7884-003 | PU | | 09/18/08 | 09/22/08 | BW | Plutonium, Isotopic in Solids |
| | | | | 7884-003 | SR | | 09/10/08 | 09/15/08 | BW | Total Strontium in Solids |
| | | | | 7884-003 | TH | | 09/11/08 | 09/15/08 | BW | Thorium, Isotopic in Solids |
| | | | | 7884-003 | U | | 09/11/08 | 09/12/08 | BW | Uranium, Isotopic in Solids |
| 51-04 | Lab Control Sample | | | 7884-004 | 93A/93 | | 09/16/08 | 09/16/08 | BW | Gross Alpha in Solids |
| | | | SOLID | 7884-004 | 93B/93 | | 09/16/08 | 09/16/08 | BW | Gross Beta in Solids |
| | | RC-088 | | 7884-004 | AM | | 09/18/08 | 09/22/08 | BW | Americium 241 in Solids |
| | | | | 7884-004 | GAM | | 09/15/08 | 09/17/08 | BW | Gamma Scan |
| | | | | 7884-004 | PU | | 09/18/08 | 09/22/08 | BW | Plutonium, Isotopic in Solids |
| | | | | 7884-004 | SR | | 09/10/08 | 09/15/08 | BW | Total Strontium in Solids |
| | | | | 7884-004 | TH | | 09/12/08 | 09/15/08 | BW | Thorium, Isotopic in Solids |
| | | | | 7884-004 | U | | 09/11/08 | 09/12/08 | BW | Uranium, Isotopic in Solids |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 09/22/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

SDG 7884
ontact Melissa C. Mannion

## WORK SUMMARY, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

| SAMPLE LECTED ECEIVED | CLIENT SAMPLE ID LOCATION CUSTODY | SAF No | MATRIX | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| )51-05 | Method Blank | | | 7884-005 | 93A/93 | | 09/15/08 | 09/16/08 | BW | Gross Alpha in Solids |
| | | | SOLID | 7884-005 | 93B/93 | | 09/15/08 | 09/16/08 | BW | Gross Beta in Solids |
| | | RC-088 | | 7884-005 | AM | | 09/18/08 | 09/22/08 | BW | Americium 241 in Solids |
| | | | | 7884-005 | GAM | | 09/15/08 | 09/17/08 | BW | Gamma Scan |
| | | | | 7884-005 | PU | | 09/19/08 | 09/22/08 | BW | Plutonium, Isotopic in Solids |
| | | | | 7884-005 | SR | | 09/10/08 | 09/15/08 | BW | Total Strontium in Solids |
| | | | | 7884-005 | TH | | 09/11/08 | 09/15/08 | BW | Thorium, Isotopic in Solids |
| | | | | 7884-005 | U | | 09/10/08 | 09/12/08 | BW | Uranium, Isotopic in Solids |
| 51-06 | Duplicate (R809051-02) | | | 7884-006 | 93A/93 | | 09/15/08 | 09/16/08 | BW | Gross Alpha in Solids |
| /18/08 | 618-7 Burial Grnd(drums) | | SOLID | 7884-006 | 93B/93 | | 09/15/08 | 09/16/08 | BW | Gross Beta in Solids |
| /05/08 | | RC-088 | | 7884-006 | AM | | 09/18/08 | 09/22/08 | BW | Americium 241 in Solids |
| | | | | 7884-006 | PU | | 09/18/08 | 09/22/08 | BW | Plutonium, Isotopic in Solids |
| | | | | 7884-006 | SR | | 09/10/08 | 09/15/08 | BW | Total Strontium in Solids |
| | | | | 7884-006 | TH | | 09/11/08 | 09/15/08 | BW | Thorium, Isotopic in Solids |
| | | | | 7884-006 | U | | 09/10/08 | 09/12/08 | BW | Uranium, Isotopic in Solids |
| 51-07 | Duplicate (R809051-02) | | | 7884-007 | GAM | | 09/14/08 | 09/17/08 | CSS | Gamma Scan |
| /18/08 | 618-7 Burial Grnd(drums) | | SOLID | | | | | | | |
| /05/08 | | RC-088 | | | | | | | | |

## COUNTS OF TESTS BY SAMPLE TYPE

| T | SAF No | METHOD | REFERENCE | CLIENT | MORE | RE | BLANK | LCS | DUP SPIKE | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| /93 | RC-088 | Gross Alpha in Solids | 900.0_ALPHABETA_GPC | 3 | | | 1 | 1 | 1 | 6 |
| /93 | RC-088 | Gross Beta in Solids | 900.0_ALPHABETA_GPC | 3 | | | 1 | 1 | 1 | 6 |
| | RC-088 | Americium 241 in Solids | AMCMISO_IE_PLATE_AEA | 3 | | | 1 | 1 | 1 | 6 |
| | RC-088 | Gamma Scan | GAMMA_GS | 3 | | | 1 | 1 | 1 | 6 |
| | RC-088 | Plutonium, Isotopic in Solids | PUISO_PLATE_AEA | 3 | | | 1 | 1 | 1 | 6 |
| | RC-088 | Total Strontium in Solids | SRTOT_SEP_PRECIP_GPC | 3 | | | 1 | 1 | 1 | 6 |
| | RC-088 | Thorium, Isotopic in Solids | THISO_IE_PLATE_AEA | 3 | | | 1 | 1 | 1 | 6 |
| | RC-088 | Uranium, Isotopic in Solids | UISO_PLATE_AEA | 3 | | | 1 | 1 | 1 | 6 |
| ALS | | | | 24 | | | 8 | 8 | 8 | 48 |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 09/22/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7884-005 Method Blank

## METHOD BLANK

| | | | |
|---|---|---|---|
| SDG | 7884 | Client/Case no | Hanford SDG K1322 |
| Contact | Melissa C. Mannion | Contract | No. S00W235A00 |
| Lab sample id | R809051-05 | Client sample id | Method Blank |
| Dept sample id | 7884-005 | Material/Matrix | SOLID |
| | | SAF No | RC-088 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Gross Alpha | 12587-46-1 | -0.440 | 2.6 | 6.22 | 10.0 | U | 93A |
| Gross Beta | 12587-47-2 | 0.427 | 4.3 | 7.38 | 15.0 | U | 93B |
| Total Strontium | SR-RAD | 0.065 | 0.51 | 1.03 | 1.00 | U | SR |
| Americium 241 | 14596-10-2 | 0.250 | 0.40 | 0.615 | 1.00 | U | AM |
| Thorium 228 | 14274-82-9 | 0.231 | 0.31 | 0.555 | 1.00 | U | TH |
| Thorium 230 | 14269-63-7 | 0.039 | 0.15 | 0.295 | 1.00 | U | TH |
| Thorium 232 | TH-232 | 0 | 0.077 | 0.295 | 1.00 | U | TH |
| Uranium 233/234 | U-233/234 | -0.022 | 0.044 | 0.166 | 1.00 | U | U |
| Uranium 235 | 15117-96-1 | 0.053 | 0.053 | 0.201 | 1.00 | U | U |
| Uranium 238 | U-238 | 0.022 | 0.044 | 0.166 | 1.00 | U | U |
| Plutonium 238 | 13981-16-3 | 0.052 | 0.21 | 0.499 | 1.00 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.052 | 0.21 | 0.399 | 1.00 | U | PU |
| Potassium 40 | 13966-00-2 | U | | 101 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 6.18 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 12.4 | 0.100 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 11.7 | 0.100 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 25.0 | 0.200 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 16.0 | 0.100 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 18.0 | 0.100 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 14.1 | 0.100 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 7.86 | | U | GAM |
| Thorium 232 | TH-232 | U | | 25.0 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 20.8 | | U | GAM |
| Uranium 238 | U-238 | U | | 636 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 20.8 | | U | GAM |

618-7 Burial Ground-Other

QC-BLANK #67203

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 09/22/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7884-004

Lab Control Sample

## LAB CONTROL SAMPLE

SDG 7884

Contact Melissa C. Mannion

Client/Case no Hanford SDG K1322

Contract No. S00W235A00

Lab sample id R809051-04

Dept sample id 7884-004

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No RC-088

| ANALYTE | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ADDED pCi/g | 2σ ERR pCi/g | REC % | 3σ LMTS (TOTAL) | PROTOCOL LIMITS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gross Alpha | 110 | 17 | 8.56 | 10.0 | | 93A | 102 | 4.1 | 108 | 58-142 | 70-130 |
| Gross Beta | 81.4 | 8.0 | 8.88 | 15.0 | | 93B | 92.6 | 3.7 | 88 | 80-120 | 80-120 |
| Total Strontium | 34.9 | 1.8 | 0.796 | 1.00 | | SR | 30.9 | 1.2 | 113 | 79-121 | 80-120 |
| Americium 241 | 36.1 | 3.9 | 0.574 | 1.00 | | AM | 34.0 | 1.4 | 106 | 78-122 | 80-120 |
| Thorium 230 | 46.3 | 4.3 | 0.352 | 1.00 | | TH | 47.2 | 1.9 | 98 | 81-119 | 80-120 |
| Uranium 233/234 | 27.8 | 3.0 | 1.39 | 1.00 | | U | 31.0 | 1.2 | 90 | 81-119 | 80-120 |
| Uranium 235 | 22.5 | 2.7 | 0.340 | 1.00 | | U | 25.2 | 1.0 | 89 | 80-120 | 80-120 |
| Uranium 238 | 29.1 | 3.1 | 1.33 | 1.00 | | U | 33.7 | 1.3 | 86 | 82-118 | 80-120 |
| Plutonium 238 | 36.8 | 2.2 | 0.304 | 1.00 | | PU | 39.0 | 1.6 | 94 | 85-115 | 80-120 |
| Plutonium 239/240 | 41.2 | 2.4 | 0.118 | 1.00 | | PU | 44.0 | 1.8 | 94 | 85-115 | 80-120 |
| Cobalt 60 | 228 | 12 | 6.41 | 0.050 | | GAM | 208 | 8.3 | 110 | 84-116 | 80-120 |
| Cesium 137 | 244 | 10 | 7.40 | 0.100 | | GAM | 233 | 9.3 | 105 | 86-114 | 80-120 |

618-7 Burial Ground-Other

QC-LCS #67202

Lab id EBRLNE

Protocol Hanford1

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 09/22/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7884-006 J178L5-A

## DUPLICATE

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7884 | | | Client/Case no | Hanford SDG K1322 |
| Contact | Melissa C. Mannion | | | Contract | No. S00W235A00 |
| | DUPLICATE | | ORIGINAL | | |
| Lab sample id | R809051-06 | Lab sample id | R809051-02 | Client sample id | J178L5-A |
| ept sample id | 7884-006 | Dept sample id | 7884-002 | Location/Matrix | 618-7 Burial Grnd(drums) SOLID |
| | | Received | 09/05/08 | Collected/Weight | 08/18/08 09:15 4.62 g |
| % solids | 100.0 | % solids | 100.0 | Custody/SAF No | RC-088-062 RC-088 |

| NALYTE | DUPLICATE pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ORIGINAL pCi/g | 2σ ERR (COUNT) | MDA pCi/g | QUALI-FIERS | RPD % | 3σ TOT | DER σ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| :ross Alpha | 1.01 | 1.3 | 1.95 | 10.0 | U | 93A | 1.30 | 1.7 | 2.62 | U | - | | 0.3 |
| :ross Beta | 1.62 | 3.0 | 4.94 | 15.0 | U | 93B | 0.638 | 4.7 | 8.26 | U | - | | 0.4 |
| ɔtal Strontium | -0.077 | 0.49 | 1.03 | 1.00 | U | SR | 0.349 | 0.46 | 0.853 | U | - | | 1.3 |
| ıericium 241 | 0.049 | 0.29 | 0.654 | 1.00 | U | AM | 0.203 | 0.41 | 0.748 | U | - | | 0.6 |
| ıorium 228 | -0.067 | 0.13 | 0.412 | 1.00 | U | TH | -0.040 | 0.24 | 0.490 | U | - | | 0.2 |
| ıorium 230 | -0.067 | 0.13 | 0.320 | 1.00 | U | TH | -0.080 | 0.16 | 0.304 | U | - | | 0.1 |
| .orium 232 | 0 | 0.067 | 0.256 | 1.00 | U | TH | 0.119 | 0.16 | 0.304 | U | - | | 1.4 |
| 'anium 233/234 | 0.442 | 0.22 | 0.211 | 1.00 | | U | 0.347 | 0.25 | 0.241 | | 24 | 128 | 0.6 |
| anium 235 | 0 | 0.067 | 0.256 | 1.00 | U | U | 0.076 | 0.077 | 0.292 | U | - | | 1.5 |
| anium 238 | 0.359 | 0.22 | 0.211 | 1.00 | | U | 0.221 | 0.19 | 0.241 | U | 48 | 151 | 0.9 |
| utonium 238 | 0.056 | 0.15 | 0.283 | 1.00 | U | PU | 0.065 | 0.16 | 0.274 | U | - | | 0.1 |
| utonium 239/240 | 0.055 | 0.11 | 0.177 | 1.00 | U | PU | 0 | 0.032 | 0.124 | U | - | | 1.0 |

8-7 Burial Ground-Other

-DUP#2 67204

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DUP |
| Version | 3.06 |
| Report date | 09/22/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7884-007 J178L5-A

## DUPLICATE

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7884 | | | Client/Case no | Hanford SDG K1322 |
| Contact | Melissa C. Mannion | | | Contract | No. S00W235A00 |
| | DUPLICATE | | ORIGINAL | | |
| Lab sample id | R809051-07 | Lab sample id | R809051-02 | Client sample id | J178L5-A |
| Dept sample id | 7884-007 | Dept sample id | 7884-002 | Location/Matrix | 618-7 Burial Grnd(drums) SOLID |
| | | Received | 09/05/08 | Collected/Weight | 08/18/08 09:15 4.62 g |
| % solids | 100.0 | % solids | 100.0 | Custody/SAF No | RC-088-062 RC-088 |

| ALYTE | DUPLICATE pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ORIGINAL pCi/g | 2σ ERR (COUNT) | MDA pCi/g | QUALI-FIERS | RPD % | 3σ TOT | DER σ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| tassium 40 | U | | 82.7 | | U | GAM | U | | 101 | U | - | | 0.3 |
| balt 60 | U | | 4.23 | 0.050 | U | GAM | U | | 4.00 | U | - | | 0.1 |
| sium 137 | U | | 3.20 | 0.100 | U | GAM | U | | 3.95 | U | - | | 0.3 |
| dium 226 | U | | 8.22 | 0.100 | U | GAM | U | | 16.4 | U | - | | 0.9 |
| dium 228 | U | | 15.9 | 0.200 | U | GAM | U | | 21.4 | U | - | | 0.4 |
| ropium 152 | U | | 9.81 | 0.100 | U | GAM | U | | 11.1 | U | - | | 0.2 |
| ropium 154 | U | | 10.6 | 0.100 | U | GAM | U | | 13.2 | U | - | | 0.3 |
| ropium 155 | U | | 9.59 | 0.100 | U | GAM | U | | 11.1 | U | - | | 0.2 |
| orium 228 | U | | 6.75 | | U | GAM | U | | 7.87 | U | - | | 0.2 |
| orium 232 | U | | 15.9 | | U | GAM | U | | 21.4 | U | - | | 0.4 |
| anium 235 | U | | 16.0 | | U | GAM | U | | 19.2 | U | - | | 0.3 |
| anium 238 | U | | 380 | | U | GAM | U | | 769 | U | - | | 0.9 |
| ericium 241 | U | | 8.61 | | U | GAM | U | | 10.0 | U | - | | 0.2 |

8-7 Burial Ground-Other



| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DUP |
| Version | 3.06 |
| Report date | 09/22/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7884-001 J178L4-A

## DATA SHEET

| | | | |
|---|---|---|---|
| SDG | 7884 | Client/Case no | Hanford SDG K1322 |
| Contact | Melissa C. Mannion | Contract | No. S00W235A00 |
| Lab sample id | R809051-01 | Client sample id | J178L4-A |
| Dept sample id | 7884-001 | Location/Matrix | 618-7 Burial Grnd(drums) SOLID |
| Received | 09/05/08 | Collected/Weight | 08/18/08 09:00 3.40 g |
| % solids | 100.0 | Custody/SAF No | RC-088-062 RC-088 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Gross Alpha | 12587-46-1 | 8.17 | 2.9 | 2.26 | 10.0 | | 93A |
| Gross Beta | 12587-47-2 | 6.33 | 4.5 | 7.07 | 15.0 | U | 93B |
| Total Strontium | SR-RAD | 0.106 | 0.27 | 0.519 | 1.00 | U | SR |
| Americium 241 | 14596-10-2 | 0.141 | 0.14 | 0.237 | 1.00 | U | AM |
| Thorium 228 | 14274-82-9 | 0.118 | 0.24 | 0.484 | 1.00 | U | TH |
| Thorium 230 | 14269-63-7 | 0.118 | 0.24 | 0.301 | 1.00 | U | TH |
| Thorium 232 | TH-232 | 0.118 | 0.16 | 0.301 | 1.00 | U | TH |
| Uranium 233/234 | U-233/234 | 3.07 | 0.43 | 0.119 | 1.00 | | U |
| Uranium 235 | 15117-96-1 | 0.301 | 0.12 | 0.115 | 1.00 | | U |
| Uranium 238 | U-238 | 2.25 | 0.37 | 0.119 | 1.00 | | U |
| Plutonium 238 | 13981-16-3 | 0 | 0.086 | 0.164 | 1.00 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.011 | 0.043 | 0.102 | 1.00 | U | PU |
| Potassium 40 | 13966-00-2 | U | | 107 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 8.76 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 6.88 | 0.100 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 19.1 | 0.100 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 36.0 | 0.200 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 21.0 | 0.100 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 24.4 | 0.100 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 14.2 | 0.100 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 13.0 | | U | GAM |
| Thorium 232 | TH-232 | U | | 36.0 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 25.8 | | U | GAM |
| Uranium 238 | U-238 | U | | 915 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 7.71 | | U | GAM |

618-7 Burial Ground-Other

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 09/22/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7884-002 J178L5-A

## DATA SHEET

| | | | |
|---|---|---|---|
| SDG | 7884 | Client/Case no | Hanford SDG K1322 |
| Contact | Melissa C. Mannion | Contract | No. S00W235A00 |
| Lab sample id | R809051-02 | Client sample id | J178L5-A |
| Dept sample id | 7884-002 | Location/Matrix | 618-7 Burial Grnd(drums) SOLID |
| Received | 09/05/08 | Collected/Weight | 08/18/08 09:15 4.62 g |
| % solids | 100.0 | Custody/SAF No | RC-088-062 RC-088 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Gross Alpha | 12587-46-1 | 1.30 | 1.7 | 2.62 | 10.0 | U | 93A |
| Gross Beta | 12587-47-2 | 0.638 | 4.7 | 8.26 | 15.0 | U | 93B |
| Total Strontium | SR-RAD | 0.349 | 0.46 | 0.853 | 1.00 | U | SR |
| Americium 241 | 14596-10-2 | 0.203 | 0.41 | 0.748 | 1.00 | U | AM |
| Thorium 228 | 14274-82-9 | -0.040 | 0.24 | 0.490 | 1.00 | U | TH |
| Thorium 230 | 14269-63-7 | -0.080 | 0.16 | 0.304 | 1.00 | U | TH |
| Thorium 232 | TH-232 | 0.119 | 0.16 | 0.304 | 1.00 | U | TH |
| Uranium 233/234 | U-233/234 | 0.347 | 0.25 | 0.241 | 1.00 | | U |
| Uranium 235 | 15117-96-1 | 0.076 | 0.077 | 0.292 | 1.00 | U | U |
| Uranium 238 | U-238 | 0.221 | 0.19 | 0.241 | 1.00 | U | U |
| Plutonium 238 | 13981-16-3 | 0.065 | 0.16 | 0.274 | 1.00 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0 | 0.032 | 0.124 | 1.00 | U | PU |
| Potassium 40 | 13966-00-2 | U | | 101 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 4.00 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 3.95 | 0.100 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 16.4 | 0.100 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 21.4 | 0.200 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 11.1 | 0.100 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 13.2 | 0.100 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 11.1 | 0.100 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 7.87 | | U | GAM |
| Thorium 232 | TH-232 | U | | 21.4 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 19.2 | | U | GAM |
| Uranium 238 | U-238 | U | | 769 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 10.0 | | U | GAM |

618-7 Burial Ground-Other

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 09/22/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7884-003 J178L6-A

## DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7884 | Client/Case no | Hanford | SDG K1322 | |
| Contact | Melissa C. Mannion | Contract | No. S00W235A00 | | |
| Lab sample id | R809051-03 | Client sample id | J178L6-A | | |
| Dept sample id | 7884-003 | Location/Matrix | 618-7 Burial Grnd(drums) | SOLID | |
| Received | 09/05/08 | Collected/Weight | 08/18/08 09:40 | 3.17 g | |
| % solids | 100.0 | Custody/SAF No | RC-088-062 | RC-088 | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Gross Alpha | 12587-46-1 | 24.8 | 4.8 | 2.85 | 10.0 | | 93A |
| Gross Beta | 12587-47-2 | 14.4 | 4.1 | 5.40 | 15.0 | | 93B |
| Total Strontium | SR-RAD | -0.200 | 0.27 | 0.614 | 1.00 | U | SR |
| Americium 241 | 14596-10-2 | 0.207 | 0.41 | 0.636 | 1.00 | U | AM |
| Thorium 228 | 14274-82-9 | 0 | 0.29 | 0.581 | 1.00 | U | TH |
| Thorium 230 | 14269-63-7 | 0.072 | 0.22 | 0.344 | 1.00 | U | TH |
| Thorium 232 | TH-232 | 0.036 | 0.072 | 0.275 | 1.00 | U | TH |
| Uranium 233/234 | U-233/234 | 12.1 | 1.5 | 0.361 | 1.00 | | U |
| Uranium 235 | 15117-96-1 | 1.55 | 0.44 | 0.232 | 1.00 | | U |
| Uranium 238 | U-238 | 8.54 | 1.2 | 0.336 | 1.00 | | U |
| Plutonium 238 | 13981-16-3 | -0.069 | 0.14 | 0.332 | 1.00 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0 | 0.035 | 0.133 | 1.00 | U | PU |
| Potassium 40 | 13966-00-2 | U | | 74.4 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 3.38 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 3.44 | 0.100 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 7.28 | 0.100 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 14.3 | 0.200 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 9.84 | 0.100 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 9.90 | 0.100 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 8.52 | 0.100 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 5.64 | | U | GAM |
| Thorium 232 | TH-232 | U | | 14.3 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 15.0 | | U | GAM |
| Uranium 238 | U-238 | U | | 394 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 9.79 | | U | GAM |

618-7 Burial Ground-Other

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 09/22/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

| | |
|---|---|
| Test | AM |
| Matrix | SOLID |
| SDG | 7884 |
| ontact | Melissa C. Mannion |

## LAB METHOD SUMMARY

AMERICIUM 241 IN SOLIDS

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client | Hanford |
| Contract | No. S00W235A00 |
| Contract | SDG K1322 |

## SULTS

| LE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Americium 241 | |
|---|---|---|---|---|---|---|
| ıration batch 6160-128 | | | | | | |
| )51-01 | | | 7884-001 | J178L4-A | U | |
| )51-02 | | | 7884-002 | J178L5-A | U | |
| ·51-03 | | | 7884-003 | J178L6-A | U | |
| ·51-04 | | | 7884-004 | Lab Control Sample | ok | |
| 51-05 | | | 7884-005 | Method Blank | U | |
| 51-06 | | | 7884-006 | Duplicate (R809051-02) | - | U |

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

Burial Ground-Other

## 'HOD PERFORMANCE

| ε ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| :ation batch 6160-128 | | | 2σ prep error 8.0 % Reference Lab Notebook #6160, pg. 128 | | | | | | | | | | | | | |
| ;1-01 | | | J178L4-A | 0.237 | 0.500 | | | 46 | | 326 | | | 31 | 09/18/08 | 09/18 | SS-042 |
| ;1-02 | | | J178L5-A | 0.748 | 0.300 | | | 52 | | 105 | | | 32 | 09/18/08 | 09/19 | SS-027 |
| ·1-03 | | | J178L6-A | 0.636 | 0.300 | | | 49 | | 145 | | | 31 | 09/18/08 | 09/18 | SS-027 |
| 1-04 | | | Lab Control Sample | 0.574 | 0.300 | | | 57 | | 145 | | | | 09/18/08 | 09/18 | SS-028 |
| 1-05 | | | Method Blank | 0.615 | 0.300 | | | 52 | | 145 | | | | 09/18/08 | 09/18 | SS-033 |
| 1-06 | | | Duplicate (R809051-02) | 0.654 | 0.300 | | | 54 | | 135 | | | 31 | 09/18/08 | 09/18 | SS-035 |
| 1 values and limits from method | | | | 1.00 | 0.300 | | | 20-105 | | 100 | 100 | | 180 | | | |

| | | |
|---|---|---|
| ΣDURES | REFERENCE | AMCMISO_IE_PLATE_AEA |
| | SPP-061 | Determination of Moisture Content in Solid Samples rev 0 |
| | SPP-073 | Soil Leaching 10-200 g Aliquot, rev 0 |
| | CP-963 | Americium and Curium in Water and Dissolved Samples by Extraction Chromatography, rev 6 |
| | CP-008 | Heavy Element Electroplating, rev 12 |

| | | | |
|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.577 | ± 0.353 |
| FOR 6 SAMPLES | YIELD | 52 | ± 8 |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 09/22/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

Test PU Matrix SOLID
SDG 7884
'ontact Melissa C. Mannion

## LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K1322

## SULTS

| LE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Plutonium 238 | | Plutonium 239/240 | |
|---|---|---|---|---|---|---|---|---|
| ıration batch 6160-128 | | | | | | | | |
| )51-01 | | | 7884-001 | J178L4-A | U | | U | |
| )51-02 | | | 7884-002 | J178L5-A | U | | U | |
| ·51-03 | | | 7884-003 | J178L6-A | U | | U | |
| 51-04 | | | 7884-004 | Lab Control Sample | ok | | ok | |
| 51-05 | | | 7884-005 | Method Blank | U | | U | |
| 51-06 | | | 7884-006 | Duplicate (R809051-02) | - | U | - | U |
| al values and limits from method | | | | RDLs (pCi/g) | 1.00 | | 1.00 | |
| Burial Ground-Other | | | | | | | | |

## HOD PERFORMANCE

| : ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ·ation batch 6160-128 | | | 2σ prep error 8.0 % | Reference Lab Notebook #6160, pg. 128 | | | | | | | | | | | | |
| 1-01 | | | J178L4-A | 0.164 | 0.500 | | | 74 | | 324 | | | 31 | 09/18/08 | 09/18 | SS-028 |
| 1-02 | | | J178L5-A | 0.274 | 0.300 | | | 73 | | 325 | | | 31 | 09/18/08 | 09/18 | SS-033 |
| 1-03 | | | J178L6-A | 0.332 | 0.300 | | | 74 | | 275 | | | 31 | 09/18/08 | 09/18 | SS-035 |
| 1-04 | | | Lab Control Sample | 0.304 | 0.300 | | | 88 | | 275 | | | | 09/18/08 | 09/18 | SS-036 |
| 1-05 | | | Method Blank | 0.499 | 0.300 | | | 80 | | 105 | | | | 09/18/08 | 09/19 | SS-032 |
| 1-06 | | | Duplicate (R809051-02) | 0.283 | 0.300 | | | 70 | | 276 | | | 31 | 09/18/08 | 09/18 | SS-038 |
| l values and limits from method | | | | 1.00 | 0.300 | | | 20-105 | | 100 | 100 | | 180 | | | |

| | | |
|---|---|---|
| DURES | REFERENCE | PUISO_PLATE_AEA |
| | SPP-073 | Soil Leaching 10-200 g Aliquot, rev 0 |
| | CP-941 | Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 3 |
| | CP-008 | Heavy Element Electroplating, rev 12 |

| | | | |
|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.309 | ± 0.218 |
| FOR 6 SAMPLES | YIELD | 76 | ± 13 |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/22/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

Test TH Matrix SOLID
SDG 7884
ntact Melissa C. Mannion

## LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K1322

## SULTS

| E ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Thorium 230 | |
|---|---|---|---|---|---|---|
| ration batch 6160-128 | | | | | | |
| 51-01 | | | 7884-001 | J178L4-A | U | |
| 51-02 | | | 7884-002 | J178L5-A | U | |
| 51-03 | | | 7884-003 | J178L6-A | U | |
| 51-04 | | | 7884-004 | Lab Control Sample | ok | |
| 51-05 | | | 7884-005 | Method Blank | U | |
| 51-06 | | | 7884-006 | Duplicate (R809051-02) | - | U |

al values and limits from method RDLs (pCi/g) 1.00
Burial Ground-Other

## HOD PERFORMANCE

| : ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ation batch 6160-128 | | | 2σ prep error 8.0 % Reference Lab Notebook #6160, pg. 128 | | | | | | | | | | | | | |
| 1-01 | | | J178L4-A | 0.484 | 0.250 | | | 85 | | 158 | | | 24 | 09/11/08 | 09/11 | SS-032 |
| 1-02 | | | J178L5-A | 0.490 | 0.200 | | | 91 | | 159 | | | 24 | 09/11/08 | 09/11 | SS-033 |
| 1-03 | | | J178L6-A | 0.581 | 0.200 | | | 93 | | 158 | | | 24 | 09/11/08 | 09/11 | SS-035 |
| 1-04 | | | Lab Control Sample | 0.352 | 0.200 | | | 98 | | 152 | | | | 09/11/08 | 09/12 | SS-062 |
| 1-05 | | | Method Blank | 0.555 | 0.200 | | | 87 | | 159 | | | | 09/11/08 | 09/11 | SS-038 |
| 1-06 | | | Duplicate (R809051-02) | 0.412 | 0.200 | | | 102 | | 160 | | | 24 | 09/11/08 | 09/11 | SS-062 |
| . values and limits from method | | | | 1.00 | 0.200 | | | 20-105 | | 150 | | | 180 | | | |

| DURES | REFERENCE | THISO_IE_PLATE_AEA |
|---|---|---|
| | SPP-073 | Soil Leaching 10-200 g Aliquot, rev 0 |
| | CP-900 | Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 1 |
| | CP-008 | Heavy Element Electroplating, rev 12 |

AVERAGES ± 2 SD MDA 0.479 ± 0.172
FOR 6 SAMPLES YIELD 93 ± 13

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/22/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

Test U Matrix SOLID
SDG 7884
Contact Melissa C. Mannion

## LAB METHOD SUMMARY

URANIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K1322

## SULTS

| LE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | 1: Uranium 233/234 | 2: Uranium 235 | 3: Uranium 238 | RESULT RATIOS (%) 1÷3 | 2σ | 2÷3 | 2σ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ıration batch 6160-128 | | | | | | | | | | | |
| )51-01 | | | 7884-001 | J178L4-A | 3.07 | 0.301 | 2.25 | 136 | 29 | 13 | 6 |
| )51-02 | | | 7884-002 | J178L5-A | 0.347 | U | U | | | | |
| )51-03 | | | 7884-003 | J178L6-A | 12.1 | 1.55 | 8.54 | 142 | 27 | 18 | 6 |
| )51-04 | | | 7884-004 | Lab Control Sample | ok | ok | ok | | | | |
| 51-05 | | | 7884-005 | Method Blank | U | U | U | | | | |
| 51-06 | | | 7884-006 | Duplicate (R809051-02) | ok | - U | ok | 123 | 97 | 0 | 19 |
| al values and limits from method | | | | RDLs (pCi/g) | 1.00 | 1.00 | 1.00 | 100 | | 4 | |
| Burial Ground-Other | | | | | | | Averages | 134 | | 11 | |

## 'HOD PERFORMANCE

| : ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ·ation batch 6160-128 2σ prep error 8.0 % Reference Lab Notebook #6160, pg. 128 | | | | | | | | | | | | | | | | |
| 1-01 | | | J178L4-A | 0.119 | 0.500 | | | 100 | | 172 | | | 23 | 09/10/08 | 09/10 | SS-051 |
| 1-02 | | | J178L5-A | 0.292 | 0.300 | | | 85 | | 172 | | | 23 | 09/10/08 | 09/10 | SS-034 |
| 1-03 | | | J178L6-A | 0.361 | 0.500 | | | 109 | | 112 | | | 24 | 09/10/08 | 09/11 | SS-040 |
| 1-04 | | | Lab Control Sample | 1.39 | 0.300 | | | 107 | | 113 | | | | 09/10/08 | 09/11 | SS-042 |
| 1-05 | | | Method Blank | 0.201 | 0.300 | | | 95 | | 172 | | | | 09/10/08 | 09/10 | SS-038 |
| 1-06 | | | Duplicate (R809051-02) | 0.256 | 0.300 | | | 93 | | 173 | | | 23 | 09/10/08 | 09/10 | SS-042 |
| l values and limits from method | | | | 1.00 | 0.300 | | | 20-105 | | 100 | 100 | | 180 | | | |

| DURES | REFERENCE | |
|---|---|---|
| | UISO_PLATE_AEA | |
| | SPP-073 | Soil Leaching 10-200 g Aliquot, rev 0 |
| | CP-921 | Uranium in Water and Dissolved Samples by Extraction Chromatography, rev 1 |
| | CP-008 | Heavy Element Electroplating, rev 12 |

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 0.436 ± 0.949
YIELD 98 ± 18

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/22/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

Test SR Matrix SOLID
SDG 7884
ontact Melissa C. Mannion

## LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS

BETA COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K1322

## SULTS

| LE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Total Strontium |
|---|---|---|---|---|---|
| ıration batch 6160-128 | | | | | |
| )51-01 | | | 7884-001 | J178L4-A | U |
| )51-02 | | | 7884-002 | J178L5-A | U |
| )51-03 | | | 7884-003 | J178L6-A | U |
| )51-04 | | | 7884-004 | Lab Control Sample | ok |
| ·51-05 | | | 7884-005 | Method Blank | U |
| ·51-06 | | | 7884-006 | Duplicate (R809051-02) | - U |

al values and limits from method RDLs (pCi/g) 1.00
Burial Ground-Other

## 'HOD PERFORMANCE

| ε ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ration batch 6160-128 | | | 2σ prep error 10.4 % Reference Lab Notebook #6160, pg. 128 | | | | | | | | | | | | | |
| ;1-01 | | | J178L4-A | 0.519 | 0.500 | | | 93 | | 100 | | | 23 | 09/10/08 | 09/10 | GRB-223 |
| ;1-02 | | | J178L5-A | 0.853 | 0.300 | | | 95 | | 100 | | | 23 | 09/10/08 | 09/10 | GRB-224 |
| ;1-03 | | | J178L6-A | 0.614 | 0.500 | | | 94 | | 100 | | | 23 | 09/10/08 | 09/10 | GRB-220 |
| ;1-04 | | | Lab Control Sample | 0.796 | 0.300 | | | 94 | | 120 | | | | 09/10/08 | 09/10 | GRB-221 |
| ;1-05 | | | Method Blank | 1.03 | 0.300 | | | 94 | | 100 | | | | 09/10/08 | 09/10 | GRB-222 |
| ;1-06 | | | Duplicate (R809051-02) | 1.03 | 0.300 | | | 94 | | 100 | | | 23 | 09/10/08 | 09/10 | GRB-223 |
| l values and limits from method | | | | 1.00 | 0.300 | | | 30-105 | | 100 | | | 180 | | | |

| EDURES | REFERENCE | SRTOT_SEP_PRECIP_GPC |
|---|---|---|
| | SPP-073 | Soil Leaching 10-200 g Aliquot, rev 0 |
| | SPP-062 | Sample Aliquoting, rev 0 |
| | CP-381 | Strontium in Solids, rev 1 |

AVERAGES ± 2 SD MDA 0.807 ± 0.421
FOR 6 SAMPLES YIELD 94 ± 1

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/22/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

Test 93A Matrix SOLID
SDG 7884
ontact Melissa C. Mannion

## LAB METHOD SUMMARY

GROSS ALPHA IN SOLIDS
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K1322

## SULTS

| LE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Gross Alpha |
|---|---|---|---|---|---|
| ıration batch 6160-128 | | | | | |
| )51-01 | 93 | | 7884-001 | J178L4-A | 8.17 |
| )51-02 | 93 | | 7884-002 | J178L5-A | U |
| )51-03 | 93 | | 7884-003 | J178L6-A | 24.8 |
| ·51-04 | 93 | | 7884-004 | Lab Control Sample | ok |
| 51-05 | 93 | | 7884-005 | Method Blank | U |
| 51-06 | 93 | | 7884-006 | Duplicate (R809051-02) | - U |

al values and limits from method RDLs (pCi/g) 10.0
Burial Ground-Other

## 'HOD PERFORMANCE

| ; ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | RESID mg | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| :ation batch 6160-128 2σ prep error 20.6 % Reference Lab Notebook #6160, pg. 128 | | | | | | | | | | | | | | | | |
| ;1-01 | 93 | | J178L4-A | 2.26 | 0.100 | | | 3 | | 100 | | | 29 | 09/11/08 | 09/16 | GRB-114 |
| ;1-02 | 93 | | J178L5-A | 2.62 | 0.100 | | | 0 | | 100 | | | 29 | 09/11/08 | 09/16 | GRB-214 |
| ;1-03 | 93 | | J178L6-A | 2.85 | 0.100 | | | 0 | | 100 | | | 29 | 09/11/08 | 09/16 | GRB-216 |
| ·1-04 | 93 | | Lab Control Sample | 8.56 | 0.100 | | | 61 | | 100 | | | | 09/11/08 | 09/16 | GRB-213 |
| 1-05 | 93 | | Method Blank | 6.22 | 0.100 | | | 60 | | 100 | | | | 09/11/08 | 09/15 | GRB-114 |
| 1-06 | 93 | | Duplicate (R809051-02) | 1.95 | 0.100 | | | 0 | | 100 | | | 28 | 09/11/08 | 09/15 | GRB-101 |
| l values and limits from method | | | | 10.0 | 0.100 | | | 5-250 | | 100 | | | 180 | | | |

| | | |
|---|---|---|
| EDURES | REFERENCE | 900.0_ALPHABETA_GPC |
| | SPP-073 | Soil Leaching 10-200 g Aliquot, rev 0 |
| | SPP-125 | Gross Alpha and Gross Beta in Dissolved Solids, rev 0 |

| | | | |
|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 4.08 | ± 5.38 |
| FOR 6 SAMPLES | RESIDUE | 21 | ± 62 |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/22/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

Test 93B Matrix SOLID
SDG 7884
ontact Melissa C. Mannion

## LAB METHOD SUMMARY

GROSS BETA IN SOLIDS

GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K1322

## SULTS

| E ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Gross Beta | |
|---|---|---|---|---|---|---|
| ration batch 6160-128 | | | | | | |
| 51-01 | 93 | | 7884-001 | J178L4-A | U | |
| 51-02 | 93 | | 7884-002 | J178L5-A | U | |
| 51-03 | 93 | | 7884-003 | J178L6-A | 14.4 | |
| 51-04 | 93 | | 7884-004 | Lab Control Sample | ok | |
| 51-05 | 93 | | 7884-005 | Method Blank | U | |
| 51-06 | 93 | | 7884-006 | Duplicate (R809051-02) | - | U |

al values and limits from method RDLs (pCi/g) 15.0
Burial Ground-Other

## HOD PERFORMANCE

| ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | RESID mg | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ation batch 6160-128 | | | 2σ prep error 11.0 % Reference Lab Notebook #6160, pg. 128 | | | | | | | | | | | | | |
| 1-01 | 93 | | J178L4-A | 7.07 | 0.100 | | | 3 | | 100 | | | 29 | 09/11/08 | 09/16 | GRB-114 |
| 1-02 | 93 | | J178L5-A | 8.26 | 0.100 | | | 0 | | 100 | | | 29 | 09/11/08 | 09/16 | GRB-214 |
| 1-03 | 93 | | J178L6-A | 5.40 | 0.100 | | | 0 | | 100 | | | 29 | 09/11/08 | 09/16 | GRB-216 |
| 1-04 | 93 | | Lab Control Sample | 8.88 | 0.100 | | | 61 | | 100 | | | | 09/11/08 | 09/16 | GRB-213 |
| 1-05 | 93 | | Method Blank | 7.38 | 0.100 | | | 60 | | 100 | | | | 09/11/08 | 09/15 | GRB-114 |
| 1-06 | 93 | | Duplicate (R809051-02) | 4.94 | 0.100 | | | 0 | | 100 | | | 28 | 09/11/08 | 09/15 | GRB-101 |
| l values and limits from method | | | | 15.0 | 0.100 | | | 5-250 | | 100 | | | 180 | | | |

| | | |
|---|---|---|
| DURES | REFERENCE | 900.0_ALPHABETA_GPC |
| | SPP-073 | Soil Leaching 10-200 g Aliquot, rev 0 |
| | SPP-125 | Gross Alpha and Gross Beta in Dissolved Solids, rev 0 |

| | | | |
|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 6.99 | ± 3.11 |
| FOR 6 SAMPLES | RESIDUE | 21 | ± 62 |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/22/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

Test GAM Matrix SOLID
SDG 7884
ontact Melissa C. Mannion

## LAB METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K1322

## SULTS

| LE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Cobalt 60 | | Cesium 137 | |
|---|---|---|---|---|---|---|---|---|
| ıration batch 6160-128 | | | | | | | | |
| )51-01 | | | 7884-001 | J178L4-A | U | | U | |
| )51-02 | | | 7884-002 | J178L5-A | U | | U | |
| )51-03 | | | 7884-003 | J178L6-A | U | | U | |
| )51-04 | | | 7884-004 | Lab Control Sample | ok | | ok | |
| )51-05 | | | 7884-005 | Method Blank | U | | U | |
| ·51-07 | | | 7884-007 | Duplicate (R809051-02) | - | U | - | U |
| al values and limits from method | | | | RDLs (pCi/g) | 0.050 | | 0.100 | |

Burial Ground-Other

## :HOD PERFORMANCE

| E ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ration batch 6160-128 | | | 2σ prep error 7.0 % | Reference Lab Notebook #6160, pg. 128 | | | | | | | | | | | | |
| 51-01 | | | J178L4-A | 2460 | 1.03 | | | | | 147 | | | 27 | 09/12/08 | 09/14 | JR,01,00 |
| 51-02 | | | J178L5-A | 1040 | 1.60 | | | | | 147 | | | 27 | 09/12/08 | 09/14 | JR,02,00 |
| 51-03 | | | J178L6-A | 951 | 1.22 | | | | | 1388 | | | 29 | 09/12/08 | 09/16 | JR,04,00 |
| 51-04 | | | Lab Control Sample | 6.41 | 1.00 | | | | | 406 | | | | 09/12/08 | 09/15 | JR,02,00 |
| 51-05 | | | Method Blank | 1540 | 1.00 | | | | | 407 | | | | 09/12/08 | 09/15 | JR,05,00 |
| 51-07 | | | Duplicate (R809051-02) | 790 | 1.60 | | | | | 206 | | | 27 | 09/12/08 | 09/14 | JR,02,00 |
| ıl values and limits from method | | | | 0.050 | 1.00 | | | | | 100 | | | 180 | | | |

| EDURES | REFERENCE | GAMMA_GS |
|---|---|---|
| | SPP-073 | Soil Leaching 10-200 g Aliquot, rev 0 |
| | SPP-100 | Ge(Li) Preparation for Commercial Samples, rev 7 |

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 1130 ± 1640
YIELD ____ ± ____

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/22/08

SDG 7884
Contact Melissa C. Mannion

# REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1322

## 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/22/08

SDG 7884
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1322

# 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/22/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

SDG 7884
Contact Melissa C. Mannion

## REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1322

## 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/22/08

SDG 7884
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1322

# 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).



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/22/08

# 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.

SDG 7884
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG_K1322

# 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/22/08

SDG 7884
Contact Melissa C. Mannion

# REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1322

## 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/22/08

SDG 7884
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1322

# 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/22/08

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.

SDG 7884
Contact Melissa C. Mannion

# REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1322

## 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

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/22/08

# 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.

# 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'

## 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.

* Prepareation 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.

# 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

## 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.

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-088-062 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Collector** B. Lawrence | **Company Contact** Joan Kessner | **Telephone No.** 509-375-4688 | **Project Coordinator** KESSNER, JH |
| **Price Code** | **Data Turnaround** 15 Days | | |
| **Project Designation** 618-7 Burial Ground - Other | **Sampling Location** 618-7 Burial Ground (drums) K1322 (7884) | | **SAF No.** RC-088 |
| **Ice Chest No.** Fiberboard Box | **Field Logbook No.** EL-1395-13 | **COA** RG61878500 | **Method of Shipment** Expedited Ground |
| **Shipped To** EBERLINE SERVICES / LIONVILLE | **Offsite Property No.** see HSMR | | **Bill of Lading/Air Bill No.** see HSMR |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radioactive contamination, potential beryllium contamination*

**Special Handling and/or Storage**

*None*

**SAMPLE ANALYSIS**

other solid MCM 9/8/8

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Preservation** | | | | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | |
| **Type of Container** | | | | aG | aG | aG | P | P | P | | | |
| **No. of Container(s)** | | | | 1 | 1 | 0 | 0 | 0 | 1 | | | |
| **Volume** | | | | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | |
| | | | | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. | | | PINH |
| **Sample No.** | **Matrix *** | **Sample Date** | **Sample Time** | | | | | | | | | |
| J178L4 -A | OTHER | 8/18/08 | 0900 | | | | | | X | | | 5901 |
| J178L5 | OTHER | | 0915 | | | | | | X | | | 5475 |
| J178L6 NP 9/3/08 | OTHER | | 0940 | | | | | | X | | | 5954 |
| J178L7 | OTHER | | 0950 | | | | | | X | | | 5952 |
| J178L8 | OTHER | 8/18/08 | 1020 | | | | | | X | | | 5777 |

PTC 8/18/08

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| B Lawrence | 1300 8-14-08 | R. Fahlberg R. Fahlberg 8-19-08 | 1300 |
| R. Fahlberg R. Fahlberg 8-19-08 | 1500 | R T COFFMAN / R T Coffman 8/19/08 | 1500 |
| R T COFFMAN / R T Coffman 9/3/08 | 1215 | M Stankovich 9/3/08 | 1215 |
| M Stankovich 9/3/08 | 1215 | Ground | |
| HK HARBOR | | Thu 09/05/08 | 14:50 |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Arsenic, Lead, Selenium, Thallium, Tin, Zirconium}; Mercury - 7471 - (CV)

(2) Gross Alpha; Gross Beta; Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Uranium; Isotopic Thorium; Americium-241; Isotopic Plutonium; Strontium-89,90 -- Total Sr

**Matrix ***

S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | Received By | Title | Date/Time |
| **FINAL SAMPLE DISPOSITION** | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-088-062 | Page 1 of 1

| | | | |
|---|---|---|---|
| **Collector** B. Lawrence | **Company Contact** Joan Kessner | **Telephone No.** 509-375-4688 | **Project Coordinator** KESSNER, JH |
| **Price Code** | **Data Turnaround** 15 Days | | |
| **Project Designation** 618-7 Burial Ground - Other | **Sampling Location** 618-7 Burial Ground (drums) K1322 (7884) | | **SAF No.** RC-088 |
| **Ice Chest No.** Fiberboard Box | **Field Logbook No.** EL-1395-13 | **COA** RG61878500 | **Method of Shipment** Expedited Ground |
| **Shipped To** EBERLINE SERVICES / LIONVILLE | **Offsite Property No.** see HSMR | | **Bill of Lading/Air Bill No.** see HSMR |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radioactive contamination, potential beryllium contamination*

**Special Handling and/or Storage**

*None*

**SAMPLE ANALYSIS**

other solid — MCM 9/8/8 — PTC 8/18/08

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Preservation** | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | | | | |
| **Type of Container** | aG | aG | aG | P | P | P | | | | | | |
| **No. of Container(s)** | 1 | 1 | 0 | 0 | 0 | 1 | | | | | | |
| **Volume** | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | | | | |
| | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. | | | | | | PIN # |
| **Sample No.** | **Matrix *** | **Sample Date** | **Sample Time** | | | | | | | | | |
| ~~J178L4~~ MO 9/3/08 | OTHER | 8/18/08 | 0900 | | | | | | X | | | 5901 |
| J178L5 - A | OTHER | | 0915 | | | | | | X | | | 5975 |
| J178L6 - A | OTHER | | 0940 | | | | | | X | | | 5954 |
| ~~J178L7~~ | ~~OTHER~~ | | 0950 | | | | | | X | | | 5952 |
| ~~J178L8~~ | ~~OTHER~~ | 8/18/08 | 1020 | | | | | | X | | | 5777 |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From B Lawrence | 1300 8-19-08 | Received By/Stored In B. Fahlberg R Fahlberg | 1300 8-19-08 |
| Relinquished By/Removed From B Fahlberg R Fahlberg | 1500 8-19-08 | Received By/Stored In RT COFFMAN / RT Coffman | 1500 8/19/08 |
| Relinquished By/Removed From RT COFFMAN / RT Coffman | 1215 9/3/08 | Received By/Stored In MStankovich | 1215 9/3/08 |
| Relinquished By/Removed From WCH MZLE MStankovich | 1215 9/3/08 | Received By/Stored In Ground | |
| Relinquished By/Removed From OAK HARBOR | | Received By/Stored In | 09/05/08 14:00 |
| Relinquished By/Removed From | | Received By/Stored In | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) (Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc); ICP Metals - 6010A (Add-on) (Arsenic, Lead, Selenium, Thallium, Tin, Zirconium); Mercury - 7471 - (CV)
(2) Gross Alpha; Gross Beta; Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Uranium; Isotopic Thorium; Americium-241; Isotopic Plutonium; Strontium-89,90 -- Total Sr

**Matrix ***
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | Received By | Title | Date/Time |
| **FINAL SAMPLE DISPOSITION** | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

EBERLINE

# RICHMOND, CA LABORATORY

## SAMPLE RECEIPT CHECKLIST

SK 9/8/08

Client: W.C. HANFORD City RICHLAND State WA

Date/Time received 09/05/08 14:02 CoC No. RC-088-06 v

Container I.D. No HAZMATBOX Requested TAT (Days) 15 P.O. Received Yes [ ] No [ ]

### INSPECTION

1 Custody seals on shipping container intact? Yes [X] No [ ] N/A [ ]

2 Custody seals on shipping container dated & signed? Yes [X] No [ ] N/A [ ]

3 Custody seals on sample containers intact? Yes [X] No [ ] N/A [ ]

4 Custody seals on sample containers dated & signed? Yes [X] No [ ] N/A [ ]

5 Packing material is: Wet [ ] Dry [X]

6 Number of samples in shipping container 5 Sample Matrix X LIQUID

7 Number of containers per sample 1 (Or see CoC )

8 Samples are in correct container Yes [X] No [ ]

9 Paperwork agrees with samples? Yes [X] No [ ]

10 Samples have Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [X]

11 Samples are in good condition [X] Leaking [ ] Broken Container [ ] Missing [ ]

12 Samples are Preserved [ ] Not preserved [ ] pH _____ Preservative _____

13 Describe any anomalies

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

15 Inspected by [signature] Date 09/05/08 Time 08:00

| Customer Sample No | Beta/Gamma cpm | Ion Chamber mR/hr | Wipe | Customer Sample No | Beta/Gamma cpm | Ion Chamber mR/hr | Wipe |
|---|---|---|---|---|---|---|---|
| ALL SAMPLES | <60 | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Ion Chamber Ser. No _____ Calibration date _____

Alpha Meter Ser. No _____ Calibration date _____

Beta/Gamma Meter Ser. No. 10048 v Calibration date 10-JULY 08

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
2030 Wright Avenue
Richmond, California 94804-3849
Phone (510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

September 24, 2008

RECEIVED
SEP 2008

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

Reference: **P.O. #S00W235A00**
**Eberline Services R8-09-052-7885, SDG K1322**

Dear Ms. Kessner:

Enclosed is the data report for five liquid (other liquid) samples designated under SAF No. RC-088 received at Eberline Services on September 5, 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 Mannion

Melissa C. Mannion
Senior Program Manager

*MCM/njv*

*Enclosure: Data Package*

## 1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K1322 was composed of five liquid (other liquid) samples designated under SAF No. RC-088 with a Project Designation of: 618-7 Burial Ground-Other Liquid.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to WCH via e-mail on September 23, 2008.

## 2.0 ANALYSIS NOTES

### 2.1 Gross Alpha and Gross Beta Analysis

No problems were encountered during the course of the analyses.

### 2.2 Total Strontium Analysis

No problems were encountered during the course of the analyses.

### 2.3 Isotopic Thorium Analysis

No problems were encountered during the course of the analyses.

### 2.4 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

### 2.5 Isotopic Plutonium Analysis

No problems were encountered during the course of the analyses.

### 2.6 Americium-241 Analysis

No problems were encountered during the course of the analyses.

### 2.7 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

## 3.0 Case Narrative Certification Statement

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

Melissa Mannion — 09/24/08

**Melissa C. Mannion**
**Senior Program Manager**

**Date**

# EBERLINE SERVICES/RICHMOND
## SAMPLE DELIVERY GROUP K1322

| | |
|---|---|
| SDG | 7885 |
| Contact | Melissa C. Mannion |

| | |
|---|---|
| Client | Hanford |
| Contract | No. S00W235A00 |
| Case no | SDG K1322 |

## SUMMARY DATA SECTION

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Melissa Mannion
Prepared by

Melissa Mannion
Reviewed by

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-TOC |
| Version | 3.06 |
| Report date | 09/23/08 |

SDG 7885
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

# 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/23/08

# ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

SDG 7885
Contact Melissa C. Mannion

## LAB SAMPLE SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

| LAB SAMPLE ID | CLIENT SAMPLE ID | LOCATION | MATRIX | LEVEL | SAF NO | CHAIN OF CUSTODY | COLLECTED |
|---|---|---|---|---|---|---|---|
| R809052-01 | J178L4-B | 618-7 Burial Ground-drum | LIQUID | | RC-088 | RC-088-062 | 08/18/08 09:00 |
| R809052-02 | J178L5-B | 618-7 Burial Ground-drum | LIQUID | | RC-088 | RC-088-062 | 08/18/08 09:15 |
| R809052-03 | J178L6-B | 618-7 Burial Ground-drum | LIQUID | | RC-088 | RC-088-062 | 08/18/08 09:40 |
| R809052-04 | J178L7 | 618-7 Burial Ground-drum | LIQUID | | RC-088 | RC-088-062 | 08/18/08 09:50 |
| R809052-05 | J178L8 | 618-7 Burial Ground-drum | LIQUID | | RC-088 | RC-088-062 | 08/18/08 10:20 |
| R809052-06 | Lab Control Sample | | LIQUID | | RC-088 | | |
| R809052-07 | Method Blank | | LIQUID | | RC-088 | | |
| R809052-08 | Duplicate (R809052-01) | 618-7 Burial Ground-drum | LIQUID | | RC-088 | | 08/18/08 09:00 |



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 09/23/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

## QC SUMMARY

SDG 7885
Contact Melissa C. Mannion

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

| C BATCH | CHAIN OF CUSTODY | CLIENT SAMPLE ID | MATRIX | % SOLIDS | SAMPLE AMOUNT | BASIS AMOUNT | DAYS SINCE RECEIVED | DAYS SINCE COLL | LAB SAMPLE ID | DEPARTMENT SAMPLE ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 885 | RC-088-062 | J178L4-B | LIQUID | | 506 mL | | 09/05/08 | 18 | R809052-01 | 7885-001 |
| | | J178L5-B | LIQUID | | 491 mL | | 09/05/08 | 18 | R809052-02 | 7885-002 |
| | | J178L6-B | LIQUID | | 501 mL | | 09/05/08 | 18 | R809052-03 | 7885-003 |
| | | J178L7 | LIQUID | | 478 mL | | 09/05/08 | 18 | R809052-04 | 7885-004 |
| | | J178L8 | LIQUID | | 526 mL | | 09/05/08 | 18 | R809052-05 | 7885-005 |
| | | Method Blank | LIQUID | | | | | | R809052-07 | 7885-007 |
| | | Lab Control Sample | LIQUID | | | | | | R809052-06 | 7885-006 |
| | | Duplicate (R809052-01) | LIQUID | | 506 mL | | 09/05/08 | 18 | R809052-08 | 7885-008 |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 09/23/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

SDG 7885
Contact Melissa C. Mannion

## PREP BATCH SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

| TEST | MATRIX | METHOD | PREPARATION BATCH | ERROR 2σ % | PLANCHETS ANALYZED CLIENT | MORE | RE | BLANK | LCS | DUP/ORIG | MS/ORIG | QUALIFIERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alpha Spectroscopy** | | | | | | | | | | | | |
| AM | LIQUID | Americium 241 in Liquid | 6160-132 | 8.0 | 5 | | | 1 | 1 | 1/1 | | |
| PU | LIQUID | Plutonium-238,239/240, Liquid | 6160-132 | 8.0 | 5 | | | 1 | 1 | 1/1 | | |
| TH | LIQUID | Thorium, Isotopic in Liquid | 6160-132 | 8.0 | 5 | | | 1 | 1 | 1/1 | | |
| U | LIQUID | Uranium in Liquid | 6160-132 | 8.0 | 5 | | | 1 | 1 | 1/1 | | |
| **Beta Counting** | | | | | | | | | | | | |
| SR | LIQUID | Total Strontium in Liquids | 6160-132 | 10.4 | 5 | | | 1 | 1 | 1/1 | | |
| **Gas Proportional Counting** | | | | | | | | | | | | |
| 93A | LIQUID | Gross Alpha in Liquid | 6160-132 | 20.6 | 5 | | | 1 | 1 | 1/1 | | |
| 93B | LIQUID | Gross Beta in Liquid | 6160-132 | 11.0 | 5 | | | 1 | 1 | 1/1 | | |
| **Gamma Spectroscopy** | | | | | | | | | | | | |
| GAM | LIQUID | Gamma Scan in Liquid | 6160-132 | 7.0 | 5 | | | 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 Hanford1
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 09/23/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

SDG 7885
Contact Melissa C. Mannion

## LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

| AB SAMPLE COLLECTED RECEIVED | CLIENT SAMPLE ID LOCATION CUSTODY | SAF No | MATRIX | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| 309052-01 | J178L4-B | | | 7885-001 | 93A/93 | | 09/15/08 | 09/16/08 | BW | Gross Alpha in Liquid |
| 08/18/08 | 618-7 Burial Ground-drum | | LIQUID | 7885-001 | 93B/93 | | 09/15/08 | 09/16/08 | BW | Gross Beta in Liquid |
| 09/05/08 | RC-088-062 | RC-088 | | 7885-001 | AM | | 09/17/08 | 09/18/08 | BW | Americium 241 in Liquid |
| | | | | 7885-001 | GAM | | 09/10/08 | 09/16/08 | CSS | Gamma Scan in Liquid |
| | | | | 7885-001 | PU | | 09/19/08 | 09/22/08 | BW | Plutonium-238,239/240, Liquid |
| | | | | 7885-001 | SR | | 09/18/08 | 09/22/08 | BW | Total Strontium in Liquids |
| | | | | 7885-001 | TH | | 09/18/08 | 09/19/08 | BW | Thorium, Isotopic in Liquid |
| | | | | 7885-001 | U | | 09/12/08 | 09/15/08 | BW | Uranium in Liquid |
| 309052-02 | J178L5-B | | | 7885-002 | 93A/93 | | 09/15/08 | 09/16/08 | BW | Gross Alpha in Liquid |
| 08/18/08 | 618-7 Burial Ground-drum | | LIQUID | 7885-002 | 93B/93 | | 09/15/08 | 09/16/08 | BW | Gross Beta in Liquid |
| 09/05/08 | RC-088-062 | RC-088 | | 7885-002 | AM | | 09/17/08 | 09/18/08 | BW | Americium 241 in Liquid |
| | | | | 7885-002 | GAM | | 09/10/08 | 09/16/08 | CSS | Gamma Scan in Liquid |
| | | | | 7885-002 | PU | | 09/19/08 | 09/22/08 | BW | Plutonium-238,239/240, Liquid |
| | | | | 7885-002 | SR | | 09/18/08 | 09/22/08 | BW | Total Strontium in Liquids |
| | | | | 7885-002 | TH | | 09/18/08 | 09/19/08 | BW | Thorium, Isotopic in Liquid |
| | | | | 7885-002 | U | | 09/12/08 | 09/15/08 | BW | Uranium in Liquid |
| 309052-03 | J178L6-B | | | 7885-003 | 93A/93 | | 09/15/08 | 09/16/08 | BW | Gross Alpha in Liquid |
| 08/18/08 | 618-7 Burial Ground-drum | | LIQUID | 7885-003 | 93B/93 | | 09/15/08 | 09/16/08 | BW | Gross Beta in Liquid |
| 09/05/08 | RC-088-062 | RC-088 | | 7885-003 | AM | | 09/17/08 | 09/18/08 | BW | Americium 241 in Liquid |
| | | | | 7885-003 | GAM | | 09/11/08 | 09/16/08 | CSS | Gamma Scan in Liquid |
| | | | | 7885-003 | PU | | 09/19/08 | 09/22/08 | BW | Plutonium-238,239/240, Liquid |
| | | | | 7885-003 | SR | | 09/18/08 | 09/22/08 | BW | Total Strontium in Liquids |
| | | | | 7885-003 | TH | | 09/20/08 | 09/22/08 | BW | Thorium, Isotopic in Liquid |
| | | | | 7885-003 | U | | 09/12/08 | 09/15/08 | BW | Uranium in Liquid |
| 309052-04 | J178L7 | | | 7885-004 | 93A/93 | | 09/15/08 | 09/16/08 | BW | Gross Alpha in Liquid |
| 08/18/08 | 618-7 Burial Ground-drum | | LIQUID | 7885-004 | 93B/93 | | 09/15/08 | 09/16/08 | BW | Gross Beta in Liquid |
| 09/05/08 | RC-088-062 | RC-088 | | 7885-004 | AM | | 09/19/08 | 09/22/08 | BW | Americium 241 in Liquid |
| | | | | 7885-004 | GAM | | 09/11/08 | 09/16/08 | CSS | Gamma Scan in Liquid |
| | | | | 7885-004 | PU | | 09/19/08 | 09/22/08 | BW | Plutonium-238,239/240, Liquid |
| | | | | 7885-004 | SR | | 09/18/08 | 09/22/08 | BW | Total Strontium in Liquids |
| | | | | 7885-004 | TH | | 09/20/08 | 09/22/08 | BW | Thorium, Isotopic in Liquid |
| | | | | 7885-004 | U | | 09/12/08 | 09/15/08 | BW | Uranium in Liquid |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 09/23/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

SDG 7885
Contact Melissa C. Mannion

## WORK SUMMARY, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

| AB SAMPLE COLLECTED RECEIVED | CLIENT SAMPLE ID LOCATION CUSTODY | SAF No | MATRIX | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| 809052-05 | J178L8 | | | 7885-005 | 93A/93 | | 09/16/08 | 09/17/08 | BW | Gross Alpha in Liquid |
| 08/18/08 | 618-7 Burial Ground-drum | | LIQUID | 7885-005 | 93B/93 | | 09/16/08 | 09/17/08 | BW | Gross Beta in Liquid |
| 09/05/08 | RC-088-062 | RC-088 | | 7885-005 | AM | | 09/19/08 | 09/22/08 | BW | Americium 241 in Liquid |
| | | | | 7885-005 | GAM | | 09/11/08 | 09/16/08 | CSS | Gamma Scan in Liquid |
| | | | | 7885-005 | PU | | 09/22/08 | 09/23/08 | BW | Plutonium-238,239/240, Liquid |
| | | | | 7885-005 | SR | | 09/18/08 | 09/22/08 | BW | Total Strontium in Liquids |
| | | | | 7885-005 | TH | | 09/20/08 | 09/22/08 | BW | Thorium, Isotopic in Liquid |
| | | | | 7885-005 | U | | 09/12/08 | 09/15/08 | BW | Uranium in Liquid |
| 309052-06 | Lab Control Sample | | | 7885-006 | 93A/93 | | 09/15/08 | 09/15/08 | BW | Gross Alpha in Liquid |
| | | | LIQUID | 7885-006 | 93B/93 | | 09/15/08 | 09/15/08 | BW | Gross Beta in Liquid |
| | | RC-088 | | 7885-006 | AM | | 09/19/08 | 09/22/08 | BW | Americium 241 in Liquid |
| | | | | 7885-006 | GAM | | 09/15/08 | 09/16/08 | CSS | Gamma Scan in Liquid |
| | | | | 7885-006 | PU | | 09/19/08 | 09/22/08 | BW | Plutonium-238,239/240, Liquid |
| | | | | 7885-006 | SR | | 09/18/08 | 09/22/08 | BW | Total Strontium in Liquids |
| | | | | 7885-006 | TH | | 09/20/08 | 09/22/08 | BW | Thorium, Isotopic in Liquid |
| | | | | 7885-006 | U | | 09/12/08 | 09/15/08 | BW | Uranium in Liquid |
| 309052-07 | Method Blank | | | 7885-007 | 93A/93 | | 09/15/08 | 09/15/08 | BW | Gross Alpha in Liquid |
| | | | LIQUID | 7885-007 | 93B/93 | | 09/15/08 | 09/15/08 | BW | Gross Beta in Liquid |
| | | RC-088 | | 7885-007 | AM | | 09/19/08 | 09/22/08 | BW | Americium 241 in Liquid |
| | | | | 7885-007 | GAM | | 09/15/08 | 09/16/08 | CSS | Gamma Scan in Liquid |
| | | | | 7885-007 | PU | | 09/19/08 | 09/22/08 | BW | Plutonium-238,239/240, Liquid |
| | | | | 7885-007 | SR | | 09/18/08 | 09/22/08 | BW | Total Strontium in Liquids |
| | | | | 7885-007 | TH | | 09/22/08 | 09/23/08 | BW | Thorium, Isotopic in Liquid |
| | | | | 7885-007 | U | | 09/12/08 | 09/15/08 | BW | Uranium in Liquid |
| 309052-08 | Duplicate (R809052-01) | | | 7885-008 | 93A/93 | | 09/15/08 | 09/15/08 | BW | Gross Alpha in Liquid |
| 08/18/08 | 618-7 Burial Ground-drum | | LIQUID | 7885-008 | 93B/93 | | 09/15/08 | 09/15/08 | BW | Gross Beta in Liquid |
| 09/05/08 | | RC-088 | | 7885-008 | AM | | 09/19/08 | 09/22/08 | BW | Americium 241 in Liquid |
| | | | | 7885-008 | GAM | | 09/15/08 | 09/16/08 | CSS | Gamma Scan in Liquid |
| | | | | 7885-008 | PU | | 09/19/08 | 09/22/08 | BW | Plutonium-238,239/240, Liquid |
| | | | | 7885-008 | SR | | 09/18/08 | 09/22/08 | BW | Total Strontium in Liquids |
| | | | | 7885-008 | TH | | 09/20/08 | 09/22/08 | BW | Thorium, Isotopic in Liquid |
| | | | | 7885-008 | U | | 09/12/08 | 09/15/08 | BW | Uranium in Liquid |



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 09/23/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

SDG 7885
Contact Melissa C. Mannion

## WORK SUMMARY, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

### COUNTS OF TESTS BY SAMPLE TYPE

| TEST | SAF No | METHOD | REFERENCE | CLIENT | MORE | RE | BLANK | LCS | DUP SPIKE | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| 93A/93 | RC-088 | Gross Alpha in Liquid | 900.0_ALPHABETA_GPC | 5 | | | 1 | 1 | 1 | 8 |
| 93B/93 | RC-088 | Gross Beta in Liquid | 900.0_ALPHABETA_GPC | 5 | | | 1 | 1 | 1 | 8 |
| AM | RC-088 | Americium 241 in Liquid | AMCMISO_IE_PLATE_AEA | 5 | | | 1 | 1 | 1 | 8 |
| GAM | RC-088 | Gamma Scan in Liquid | GAMMA_GS | 5 | | | 1 | 1 | 1 | 8 |
| PU | RC-088 | Plutonium-238,239/240, Liquid | PUISO_PLATE_AEA | 5 | | | 1 | 1 | 1 | 8 |
| SR | RC-088 | Total Strontium in Liquids | SRTOT_SEP_PRECIP_GPC | 5 | | | 1 | 1 | 1 | 8 |
| TH | RC-088 | Thorium, Isotopic in Liquid | THISO_IE_PLATE_AEA | 5 | | | 1 | 1 | 1 | 8 |
| U | RC-088 | Uranium in Liquid | UISO_PLATE_AEA | 5 | | | 1 | 1 | 1 | 8 |
| TOTALS | | | | 40 | | | 8 | 8 | 8 | 64 |



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 09/23/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7885-007 Method Blank

## METHOD BLANK

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7885 | Client/Case no | Hanford | SDG_K1322 | |
| Contact | Melissa C. Mannion | Contract | No. S00W235A00 | | |
| Lab sample id | R809052-07 | Client sample id | Method Blank | | |
| Dept sample id | 7885-007 | Material/Matrix | | LIQUID | |
| | | SAF No | RC-088 | | |

| ANALYTE | CAS NO | RESULT pCi/mL | 2σ ERR (COUNT) | MDA pCi/mL | RDL pCi/mL | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Gross Alpha | 12587-46-1 | 1.47 | 4.2 | 7.68 | 10.0 | U | 93A |
| Gross Beta | 12587-47-2 | -2.10 | 4.8 | 8.64 | 15.0 | U | 93B |
| Total Strontium | SR-RAD | 0.040 | 0.18 | 0.350 | 1.00 | U | SR |
| Americium 241 | 14596-10-2 | 0.050 | 0.20 | 0.385 | 1.00 | U | AM |
| Thorium 228 | 14274-82-9 | -0.018 | 0.064 | 0.129 | 1.00 | U | TH |
| Thorium 230 | 14269-63-7 | -0.023 | 0.055 | 0.081 | 1.00 | U | TH |
| Thorium 232 | TH-232 | 0.014 | 0.027 | 0.035 | 1.00 | U | TH |
| Uranium 233/234 | U-233/234 | 0.105 | 0.14 | 0.269 | 1.00 | U | U |
| Uranium 235 | 15117-96-1 | 0 | 0.085 | 0.325 | 1.00 | U | U |
| Uranium 238 | U-238 | 0 | 0.070 | 0.269 | 1.00 | U | U |
| Plutonium 238 | 13981-16-3 | 0.007 | 0.041 | 0.081 | 1.00 | U | PU |
| Plutonium 239/240 | PU-239/240 | -0.003 | 0.020 | 0.042 | 1.00 | U | PU |
| Potassium 40 | 13966-00-2 | U | | 2.15 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.076 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.080 | 0.050 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 0.172 | 0.100 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 0.376 | 0.200 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.214 | 0.100 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.213 | 0.100 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.172 | 0.100 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 0.116 | | U | GAM |
| Thorium 232 | TH-232 | U | | 0.376 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.294 | | U | GAM |
| Uranium 238 | U-238 | U | | 8.82 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 0.293 | | U | GAM |

618-7 Burial Ground-Other

QC-BLANK #67206

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7885-006

Lab Control Sample

## LAB CONTROL SAMPLE

SDG 7885

Contact Melissa C. Mannion

Client/Case no Hanford SDG K1322

Contract No. S00W235A00

Lab sample id R809052-06

Dept sample id 7885-006

Client sample id Lab Control Sample

Material/Matrix LIQUID

SAF No RC-088

| ANALYTE | RESULT pCi/mL | 2σ ERR (COUNT) | MDA pCi/mL | RDL pCi/mL | QUALI-FIERS | TEST | ADDED pCi/mL | 2σ ERR pCi/mL | REC % | 3σ LMTS (TOTAL) | PROTOCOL LIMITS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gross Alpha | 133 | 19 | 8.54 | 10.0 | | 93A | 112 | 4.5 | 119 | 55-145 | 70-130 |
| Gross Beta | 112 | 8.8 | 8.87 | 15.0 | | 93B | 111 | 4.4 | 101 | 79-121 | 70-130 |
| Total Strontium | 11.2 | 0.61 | 0.253 | 1.00 | | SR | 10.2 | 0.41 | 110 | 80-120 | 80-120 |
| Americium 241 | 22.5 | 2.7 | 0.323 | 1.00 | | AM | 22.4 | 0.90 | 100 | 77-123 | 80-120 |
| Thorium 230 | 38.1 | 3.0 | 0.218 | 1.00 | | TH | 41.6 | 1.7 | 92 | 83-117 | 80-120 |
| Uranium 233/234 | 17.5 | 1.6 | 0.689 | 1.00 | | U | 19.3 | 0.77 | 91 | 82-118 | 80-120 |
| Uranium 235 | 13.2 | 1.3 | 0.147 | 1.00 | | U | 15.7 | 0.63 | 84 | 83-117 | 80-120 |
| Uranium 238 | 18.4 | 1.6 | 0.659 | 1.00 | | U | 21.0 | 0.84 | 88 | 83-117 | 80-120 |
| Plutonium 238 | 25.6 | 0.85 | 0.080 | 1.00 | | PU | 25.6 | 1.0 | 100 | 86-114 | 80-120 |
| Plutonium 239/240 | 28.3 | 0.92 | 0.041 | 1.00 | | PU | 29.0 | 1.2 | 98 | 86-114 | 80-120 |
| Cobalt 60 | 2.28 | 0.16 | 0.100 | 0.050 | | GAM | 2.43 | 0.097 | 94 | 85-115 | 80-120 |
| Cesium 137 | 2.94 | 0.16 | 0.107 | 0.050 | | GAM | 2.79 | 0.11 | 105 | 85-115 | 80-120 |

618-7 Burial Ground-Other

QC-LCS #67205

Lab id EBRLNE

Protocol Hanford1

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 09/23/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7885-008 J178L4-B

## DUPLICATE

| | | | |
|---|---|---|---|
| SDG | 7885 | Client/Case no | Hanford SDG K1322 |
| Contact | Melissa C. Mannion | Contract | No. S00W235A00 |
| DUPLICATE | | ORIGINAL | |
| Lab sample id | R809052-08 | Lab sample id | R809052-01 |
| Dept sample id | 7885-008 | Dept sample id | 7885-001 |
| | | Received | 09/05/08 |
| Client sample id | J178L4-B | | |
| Location/Matrix | 618-7 Burial Ground-drum LIQUID | | |
| Collected/Volume | 08/18/08 09:00 506 mL | | |
| Custody/SAF No | RC-088-062 RC-088 | | |

| ANALYTE | DUPLICATE pCi/mL | 2σ ERR (COUNT) | MDA pCi/mL | RDL pCi/mL | QUALI-FIERS | TEST | ORIGINAL pCi/mL | 2σ ERR (COUNT) | MDA pCi/mL | QUALI-FIERS | RPD % | 3σ TOT | DER σ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gross Alpha | 6.56 | 2.7 | 2.74 | 10.0 | | 93A | 7.46 | 2.7 | 2.42 | | 13 | 93 | 0.4 |
| Gross Beta | 4.91 | 3.3 | 5.10 | 15.0 | U | 93B | 8.48 | 4.2 | 6.31 | | 53 | 122 | 1.3 |
| Total Strontium | 0.021 | 0.14 | 0.286 | 1.00 | U | SR | -0.018 | 0.14 | 0.293 | U | - | | 0.4 |
| Americium 241 | 0 | 0.17 | 0.322 | 1.00 | U | AM | 0.017 | 0.042 | 0.062 | U | - | | 0.2 |
| Thorium 228 | 0.112 | 0.18 | 0.322 | 1.00 | U | TH | -0.027 | 0.11 | 0.226 | U | - | | 1.3 |
| Thorium 230 | -0.045 | 0.089 | 0.170 | 1.00 | U | TH | 0.027 | 0.11 | 0.147 | U | - | | 1.0 |
| Thorium 232 | 0.022 | 0.089 | 0.170 | 1.00 | U | TH | 0 | 0.027 | 0.102 | U | - | | 0.5 |
| Uranium 233/234 | 3.28 | 0.66 | 0.257 | 1.00 | | U | 3.58 | 0.69 | 0.268 | | 9 | 45 | 0.6 |
| Uranium 235 | 0.520 | 0.26 | 0.249 | 1.00 | | U | 0.440 | 0.27 | 0.259 | | 17 | 118 | 0.4 |
| Uranium 238 | 2.34 | 0.57 | 0.257 | 1.00 | | U | 3.05 | 0.67 | 0.268 | | 26 | 52 | 1.5 |
| Plutonium 238 | 0.017 | 0.028 | 0.054 | 1.00 | U | PU | 0.043 | 0.13 | 0.237 | U | - | | 0.4 |
| Plutonium 239/240 | 0.003 | 0.011 | 0.021 | 1.00 | U | PU | 0.021 | 0.043 | 0.164 | U | - | | 0.8 |
| Potassium 40 | U | | 2.34 | | U | GAM | U | | 1.38 | U | - | | 0.7 |
| Cobalt 60 | U | | 0.099 | 0.050 | U | GAM | U | | 0.111 | U | - | | 0.2 |
| Cesium 137 | U | | 0.090 | 0.050 | U | GAM | U | | 0.055 | U | - | | 0.7 |
| Radium 226 | U | | 0.201 | 0.100 | U | GAM | U | | 0.112 | U | - | | 0.8 |
| Radium 228 | U | | 0.426 | 0.200 | U | GAM | U | | 0.392 | U | - | | 0.1 |
| Europium 152 | U | | 0.259 | 0.100 | U | GAM | U | | 0.143 | U | - | | 0.8 |
| Europium 154 | U | | 0.286 | 0.100 | U | GAM | U | | 0.139 | U | - | | 0.9 |
| Europium 155 | U | | 0.186 | 0.100 | U | GAM | U | | 0.120 | U | - | | 0.6 |
| Thorium 228 | U | | 0.142 | | U | GAM | U | | 0.082 | U | - | | 0.7 |
| Thorium 232 | U | | 0.426 | | U | GAM | U | | 0.392 | U | - | | 0.1 |
| Uranium 235 | U | | 0.381 | | U | GAM | 0.228 | 0.14 | 0.204 | | 50 | 200 | 0.8 |
| Uranium 238 | U | | 11.6 | | U | GAM | U | | 7.90 | U | - | | 0.5 |
| Americium 241 | U | | 0.085 | | U | GAM | U | | 0.188 | U | - | | 1.0 |

618-7 Burial Ground-Other

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DUP |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7885-008 J178L4-B

## DUPLICATE, cont.

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7885 | | | Client/Case no | Hanford SDG K1322 |
| Contact | Melissa C. Mannion | | | Contract | No. S00W235A00 |
| | DUPLICATE | | ORIGINAL | | |
| Lab sample id | R809052-08 | Lab sample id | R809052-01 | Client sample id | J178L4-B |
| Dept sample id | 7885-008 | Dept sample id | 7885-001 | Location/Matrix | 618-7 Burial Ground-drum LIQUID |
| | | Received | 09/05/08 | Collected/Volume | 08/18/08 09:00 506 mL |
| | | | | Custody/SAF No | RC-088-062 RC-088 |

QC-DUP#1 67207

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DUP |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7885-001 J178L4-B

## DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7885 | Client/Case no | Hanford | SDG K1322 | |
| Contact | Melissa C. Mannion | Contract | No. S00W235A00 | | |
| Lab sample id | R809052-01 | Client sample id | J178L4-B | | |
| Dept sample id | 7885-001 | Location/Matrix | 618-7 Burial Ground-drum | LIQUID | |
| Received | 09/05/08 | Collected/Volume | 08/18/08 09:00 | 506 mL | |
| | | Custody/SAF No | RC-088-062 | RC-088 | |

| ANALYTE | CAS NO | RESULT pCi/mL | 2σ ERR (COUNT) | MDA pCi/mL | RDL pCi/mL | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Gross Alpha | 12587-46-1 | 7.46 | 2.7 | 2.42 | 10.0 | | 93A |
| Gross Beta | 12587-47-2 | 8.48 | 4.2 | 6.31 | 15.0 | | 93B |
| Total Strontium | SR-RAD | -0.018 | 0.14 | 0.293 | 1.00 | U | SR |
| Americium 241 | 14596-10-2 | 0.017 | 0.042 | 0.062 | 1.00 | U | AM |
| Thorium 228 | 14274-82-9 | -0.027 | 0.11 | 0.226 | 1.00 | U | TH |
| Thorium 230 | 14269-63-7 | 0.027 | 0.11 | 0.147 | 1.00 | U | TH |
| Thorium 232 | TH-232 | 0 | 0.027 | 0.102 | 1.00 | U | TH |
| Uranium 233/234 | U-233/234 | 3.58 | 0.69 | 0.268 | 1.00 | | U |
| Uranium 235 | 15117-96-1 | 0.440 | 0.27 | 0.259 | 1.00 | | U |
| Uranium 238 | U-238 | 3.05 | 0.67 | 0.268 | 1.00 | | U |
| Plutonium 238 | 13981-16-3 | 0.043 | 0.13 | 0.237 | 1.00 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.021 | 0.043 | 0.164 | 1.00 | U | PU |
| Potassium 40 | 13966-00-2 | U | | 1.38 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.111 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.055 | 0.050 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 0.112 | 0.100 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 0.392 | 0.200 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.143 | 0.100 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.139 | 0.100 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.120 | 0.100 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 0.082 | | U | GAM |
| Thorium 232 | TH-232 | U | | 0.392 | | U | GAM |
| Uranium 235 | 15117-96-1 | 0.228 | 0.14 | 0.204 | | | GAM |
| Uranium 238 | U-238 | U | | 7.90 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 0.188 | | U | GAM |

618-7 Burial Ground-Other

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7885-002 J178L5-B

## DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7885 | Client/Case no | Hanford | SDG K1322 | |
| Contact | Melissa C. Mannion | Contract | No. S00W235A00 | | |
| Lab sample id | R809052-02 | Client sample id | J178L5-B | | |
| Dept sample id | 7885-002 | Location/Matrix | 618-7 Burial Ground-drum | LIQUID | |
| Received | 09/05/08 | Collected/Volume | 08/18/08 09:15 | 491 mL | |
| | | Custody/SAF No | RC-088-062 | RC-088 | |

| ANALYTE | CAS NO | RESULT pCi/mL | 2σ ERR (COUNT) | MDA pCi/mL | RDL pCi/mL | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Gross Alpha | 12587-46-1 | 0.874 | 1.2 | 2.09 | 10.0 | U | 93A |
| Gross Beta | 12587-47-2 | -0.503 | 2.5 | 4.40 | 15.0 | U | 93B |
| Total Strontium | SR-RAD | 0.112 | 0.19 | 0.356 | 1.00 | U | SR |
| Americium 241 | 14596-10-2 | -0.013 | 0.044 | 0.077 | 1.00 | U | AM |
| Thorium 228 | 14274-82-9 | -0.026 | 0.11 | 0.223 | 1.00 | U | TH |
| Thorium 230 | 14269-63-7 | -0.039 | 0.079 | 0.126 | 1.00 | U | TH |
| Thorium 232 | TH-232 | 0 | 0.026 | 0.101 | 1.00 | U | TH |
| Uranium 233/234 | U-233/234 | 0.258 | 0.13 | 0.164 | 1.00 | | U |
| Uranium 235 | 15117-96-1 | 0 | 0.052 | 0.199 | 1.00 | U | U |
| Uranium 238 | U-238 | 0.279 | 0.17 | 0.164 | 1.00 | | U |
| Plutonium 238 | 13981-16-3 | 0.048 | 0.059 | 0.095 | 1.00 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.029 | 0.022 | 0.035 | 1.00 | U | PU |
| Potassium 40 | 13966-00-2 | U | | 1.93 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.071 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.066 | 0.050 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 0.157 | 0.100 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 0.318 | 0.200 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.203 | 0.100 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.221 | 0.100 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.156 | 0.100 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 0.121 | | U | GAM |
| Thorium 232 | TH-232 | U | | 0.318 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.318 | | U | GAM |
| Uranium 238 | U-238 | U | | 8.16 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 0.072 | | U | GAM |

618-7 Burial Ground-Other

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7885-003 J178L6-B

## DATA SHEET

| | | | |
|---|---|---|---|
| SDG | 7885 | Client/Case no | Hanford SDG K1322 |
| Contact | Melissa C. Mannion | Contract | No. S00W235A00 |
| Lab sample id | R809052-03 | Client sample id | J178L6-B |
| Dept sample id | 7885-003 | Location/Matrix | 618-7 Burial Ground-drum LIQUID |
| Received | 09/05/08 | Collected/Volume | 08/18/08 09:40 501 mL |
| | | Custody/SAF No | RC-088-062 RC-088 |

| ANALYTE | CAS NO | RESULT pCi/mL | 2σ ERR (COUNT) | MDA pCi/mL | RDL pCi/mL | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Gross Alpha | 12587-46-1 | 17.9 | 3.8 | 2.01 | 10.0 | | 93A |
| Gross Beta | 12587-47-2 | 9.80 | 3.7 | 5.02 | 15.0 | | 93B |
| Total Strontium | SR-RAD | -0.007 | 0.13 | 0.272 | 1.00 | U | SR |
| Americium 241 | 14596-10-2 | 0.027 | 0.039 | 0.060 | 1.00 | U | AM |
| Thorium 228 | 14274-82-9 | 0 | 0.15 | 0.336 | 1.00 | U | TH |
| Thorium 230 | 14269-63-7 | -0.025 | 0.10 | 0.239 | 1.00 | U | TH |
| Thorium 232 | TH-232 | 0 | 0.050 | 0.191 | 1.00 | U | TH |
| Uranium 233/234 | U-233/234 | 7.84 | 1.0 | 0.302 | 1.00 | | U |
| Uranium 235 | 15117-96-1 | 1.09 | 0.37 | 0.195 | 1.00 | | U |
| Uranium 238 | U-238 | 5.48 | 0.79 | 0.282 | 1.00 | | U |
| Plutonium 238 | 13981-16-3 | -0.007 | 0.054 | 0.105 | 1.00 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.010 | 0.020 | 0.037 | 1.00 | U | PU |
| Potassium 40 | 13966-00-2 | U | | 1.97 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.066 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.068 | 0.050 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 0.161 | 0.100 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 0.324 | 0.200 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.208 | 0.100 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.214 | 0.100 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.169 | 0.100 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 0.126 | | U | GAM |
| Thorium 232 | TH-232 | U | | 0.324 | | U | GAM |
| Uranium 235 | 15117-96-1 | 0.459 | 0.26 | 0.357 | | | GAM |
| Uranium 238 | U-238 | 10.4 | 7.8 | 8.68 | | | GAM |
| Americium 241 | 14596-10-2 | U | | 0.081 | | U | GAM |

618-7 Burial Ground-Other



| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7885-004 J178L7

## DATA SHEET

| | | | |
|---|---|---|---|
| SDG | 7885 | Client/Case no | Hanford SDG K1322 |
| Contact | Melissa C. Mannion | Contract | No. S00W235A00 |
| Lab sample id | R809052-04 | Client sample id | J178L7 |
| Dept sample id | 7885-004 | Location/Matrix | 618-7 Burial Ground-drum LIQUID |
| Received | 09/05/08 | Collected/Volume | 08/18/08 09:50 478 mL |
| | | Custody/SAF No | RC-088-062 RC-088 |

| ANALYTE | CAS NO | RESULT pCi/mL | 2σ ERR (COUNT) | MDA pCi/mL | RDL pCi/mL | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Gross Alpha | 12587-46-1 | 0.353 | 1.1 | 2.02 | 10.0 | U | 93A |
| Gross Beta | 12587-47-2 | 0.398 | 5.1 | 8.46 | 15.0 | U | 93B |
| Total Strontium | SR-RAD | -0.154 | 0.14 | 0.324 | 1.00 | U | SR |
| Americium 241 | 14596-10-2 | 0.101 | 0.20 | 0.370 | 1.00 | U | AM |
| Thorium 228 | 14274-82-9 | 0.124 | 0.20 | 0.331 | 1.00 | U | TH |
| Thorium 230 | 14269-63-7 | 0.098 | 0.15 | 0.236 | 1.00 | U | TH |
| Thorium 232 | TH-232 | -0.025 | 0.049 | 0.188 | 1.00 | U | TH |
| Uranium 233/234 | U-233/234 | 0.296 | 0.15 | 0.141 | 1.00 | | U |
| Uranium 235 | 15117-96-1 | 0.022 | 0.045 | 0.171 | 1.00 | U | U |
| Uranium 238 | U-238 | 0.296 | 0.15 | 0.141 | 1.00 | | U |
| Plutonium 238 | 13981-16-3 | -0.003 | 0.055 | 0.101 | 1.00 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.009 | 0.018 | 0.034 | 1.00 | U | PU |
| Potassium 40 | 13966-00-2 | U | | 0.360 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.037 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.031 | 0.050 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 0.058 | 0.100 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 0.125 | 0.200 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.077 | 0.100 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.093 | 0.100 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.054 | 0.100 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 0.047 | | U | GAM |
| Thorium 232 | TH-232 | U | | 0.125 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.108 | | U | GAM |
| Uranium 238 | U-238 | U | | 4.04 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 0.032 | | U | GAM |

618-7 Burial Ground-Other



| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

7885-005 J178L8

## DATA SHEET

| | | | |
|---|---|---|---|
| SDG | 7885 | Client/Case no | Hanford SDG K1322 |
| Contact | Melissa C. Mannion | Contract | No. S00W235A00 |
| Lab sample id | R809052-05 | Client sample id | J178L8 |
| Dept sample id | 7885-005 | Location/Matrix | 618-7 Burial Ground-drum LIQUID |
| Received | 09/05/08 | Collected/Volume | 08/18/08 10:20 526 mL |
| | | Custody/SAF No | RC-088-062 RC-088 |

| ANALYTE | CAS NO | RESULT pCi/mL | 2σ ERR (COUNT) | MDA pCi/mL | RDL pCi/mL | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Gross Alpha | 12587-46-1 | -0.347 | 0.81 | 2.15 | 10.0 | U | 93A |
| Gross Beta | 12587-47-2 | -0.841 | 4.1 | 7.05 | 15.0 | U | 93B |
| Total Strontium | SR-RAD | 0.035 | 0.17 | 0.325 | 1.00 | U | SR |
| Americium 241 | 14596-10-2 | 0 | 0.20 | 0.470 | 1.00 | U | AM |
| Thorium 228 | 14274-82-9 | 0.073 | 0.24 | 0.410 | 1.00 | U | TH |
| Thorium 230 | 14269-63-7 | 0.072 | 0.14 | 0.231 | 1.00 | U | TH |
| Thorium 232 | TH-232 | 0 | 0.048 | 0.184 | 1.00 | U | TH |
| Uranium 233/234 | U-233/234 | 0.041 | 0.041 | 0.156 | 1.00 | U | U |
| Uranium 235 | 15117-96-1 | 0 | 0.049 | 0.189 | 1.00 | U | U |
| Uranium 238 | U-238 | 0.020 | 0.041 | 0.156 | 1.00 | U | U |
| Plutonium 238 | 13981-16-3 | 0.003 | 0.053 | 0.098 | 1.00 | U | PU |
| Plutonium 239/240 | PU-239/240 | -0.003 | 0.018 | 0.036 | 1.00 | U | PU |
| Potassium 40 | 13966-00-2 | U | | 1.23 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.046 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.052 | 0.050 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 0.102 | 0.100 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 0.214 | 0.200 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.136 | 0.100 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.172 | 0.100 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.111 | 0.100 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 0.074 | | U | GAM |
| Thorium 232 | TH-232 | U | | 0.214 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.177 | | U | GAM |
| Uranium 238 | U-238 | U | | 4.90 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 0.170 | | U | GAM |

618-7 Burial Ground-Other

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

Test AM Matrix LIQUID
SDG 7885
Contact Melissa C. Mannion

## LAB METHOD SUMMARY

AMERICIUM 241 IN LIQUID

ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K1322

## RESULTS

| LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Americium 241 |
|---|---|---|---|---|---|
| Preparation batch 6160-132 | | | | | |
| 809052-01 | | | 7885-001 | J178L4-B | U |
| 809052-02 | | | 7885-002 | J178L5-B | U |
| 809052-03 | | | 7885-003 | J178L6-B | U |
| 809052-04 | | | 7885-004 | J178L7 | U |
| 809052-05 | | | 7885-005 | J178L8 | U |
| 809052-06 | | | 7885-006 | LCS (QC ID=67205) | ok |
| 809052-07 | | | 7885-007 | BLK (QC ID=67206) | U |
| 809052-08 | | | 7885-008 | Duplicate (R809052-01) | - U |

Nominal values and limits from method RDLs (pCi/mL) 1.00
18-7 Burial Ground-Other

## METHOD PERFORMANCE

| LAB SAMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/mL | ALIQ mL | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6160-132 2σ prep error 8.0 % Reference Lab Notebook #6160, pg. 132 | | | | | | | | | | | | | | | | |
| 809052-01 | | | J178L4-B | 0.062 | 0.532 | | | 62 | | 942 | | | 30 | 09/17/08 | 09/17 | SS-051 |
| 809052-02 | | | J178L5-B | 0.077 | 0.549 | | | 54 | | 942 | | | 30 | 09/17/08 | 09/17 | SS-052 |
| 809052-03 | | | J178L6-B | 0.060 | 0.552 | | | 58 | | 942 | | | 30 | 09/17/08 | 09/17 | SS-053 |
| 809052-04 | | | J178L7 | 0.370 | 0.502 | | | 65 | | 105 | | | 32 | 09/17/08 | 09/19 | SS-033 |
| 809052-05 | | | J178L8 | 0.470 | 0.500 | | | 49 | | 109 | | | 32 | 09/17/08 | 09/19 | SS-042 |
| 809052-06 | | | LCS (QC ID=67205) | 0.323 | 0.500 | | | 46 | | 109 | | | | 09/17/08 | 09/19 | SS-051 |
| 809052-07 | | | BLK (QC ID=67206) | 0.385 | 0.500 | | | 44 | | 109 | | | | 09/17/08 | 09/19 | SS-052 |
| 809052-08 | | | Duplicate (R809052-01) (QC ID=67207) | 0.322 | 0.532 | | | 48 | | 110 | | | 32 | 09/17/08 | 09/19 | SS-053 |
| Nominal values and limits from method | | | | 1.00 | 0.500 | | | 20-105 | | 50 | 100 | | 180 | | | |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/23/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

| | |
|---|---|
| Test AM | Matrix LIQUID |
| SDG 7885 | |
| Contact Melissa C. Mannion | |

## LAB METHOD SUMMARY, cont.

AMERICIUM 241 IN LIQUID

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client Hanford | |
| Contract No. S00W235A00 | |
| Contract SDG K1322 | |

| | | |
|---|---|---|
| PROCEDURES | REFERENCE | AMCMISO_IE_PLATE_AEA |
| | SPP-071 | Soil Dissolution, > 1.0g Aliquot, rev 5 |
| | CP-963 | Americium and Curium in Water and Dissolved Samples by Extraction Chromatography, rev 6 |
| | CP-008 | Heavy Element Electroplating, rev 12 |

| | | | | |
|---|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.259 | ± | 0.332 |
| FOR 8 SAMPLES | YIELD | 53 | ± | 16 |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

Test PU Matrix LIQUID
SDG 7885
Contact Melissa C. Mannion

## LAB METHOD SUMMARY

PLUTONIUM-238,239/240, LIQUID
ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K1322

## ESULTS

| AB AMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Plutonium 238 | Plutonium 239/240 |
|---|---|---|---|---|---|---|
| reparation batch 6160-132 | | | | | | |
| 309052-01 | | | 7885-001 | J178L4-B | U | U |
| 309052-02 | | | 7885-002 | J178L5-B | U | U |
| 309052-03 | | | 7885-003 | J178L6-B | U | U |
| 309052-04 | | | 7885-004 | J178L7 | U | U |
| 309052-05 | | | 7885-005 | J178L8 | U | U |
| 309052-06 | | | 7885-006 | LCS (QC ID=67205) | ok | ok |
| 309052-07 | | | 7885-007 | BLK (QC ID=67206) | U | U |
| 309052-08 | | | 7885-008 | Duplicate (R809052-01) | - U | - U |
| ominal values and limits from method | | | | RDLs (pCi/mL) | 1.00 | 1.00 |
| 18-7 Burial Ground-Other | | | | | | |

## ETHOD PERFORMANCE

| AB AMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MAX MDA pCi/mL | ALIQ mL | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| reparation batch 6160-132 | | | 2σ prep error 8.0 % | Reference Lab Notebook #6160, pg. 132 | | | | | | | | | | | | |
| 309052-01 | | | J178L4-B | 0.237 | 0.532 | | | 82 | | 117 | | | 32 | 09/18/08 | 09/19 | SS-062 |
| 309052-02 | | | J178L5-B | 0.095 | 0.549 | | | 65 | | 884 | | | 32 | 09/18/08 | 09/19 | SS-033 |
| 309052-03 | | | J178L6-B | 0.105 | 0.552 | | | 69 | | 883 | | | 32 | 09/18/08 | 09/19 | SS-035 |
| 309052-04 | | | J178L7 | 0.101 | 0.502 | | | 81 | | 883 | | | 32 | 09/18/08 | 09/19 | SS-036 |
| 309052-05 | | | J178L8 | 0.098 | 0.500 | | | 79 | | 977 | | | 35 | 09/18/08 | 09/22 | SS-035 |
| 309052-06 | | | LCS (QC ID=67205) | 0.080 | 0.500 | | | 80 | | 883 | | | | 09/18/08 | 09/19 | SS-038 |
| 309052-07 | | | BLK (QC ID=67206) | 0.081 | 0.500 | | | 73 | | 884 | | | | 09/18/08 | 09/19 | SS-062 |
| 309052-08 | | | Duplicate (R809052-01) (QC ID=67207) | 0.054 | 0.532 | | | 84 | | 885 | | | 32 | 09/18/08 | 09/19 | SS-064 |
| ominal values and limits from method | | | | 1.00 | 0.500 | | | 20-105 | | 50 | | | 180 | | | |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/23/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

| | |
|---|---|
| Test | PU |
| Matrix | LIQUID |
| SDG | 7885 |
| Contact | Melissa C. Mannion |

## LAB METHOD SUMMARY, cont.

PLUTONIUM-238,239/240, LIQUID

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client | Hanford |
| Contract | No. S00W235A00 |
| Contract | SDG K1322 |

| PROCEDURES | REFERENCE | PUISO_PLATE_AEA |
|---|---|---|
| | SPP-071 | Soil Dissolution, > 1.0g Aliquot, rev 5 |
| | CP-941 | Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 3 |
| | CP-008 | Heavy Element Electroplating, rev 12 |

| | | | | |
|---|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.106 | ± | 0.111 |
| FOR 8 SAMPLES | YIELD | 77 | ± | 14 |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

Test TH Matrix LIQUID
SDG 7885
Contact Melissa C. Mannion

## LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN LIQUID

ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K1322

## :ESULTS

| AB AMPLE ID | RAW TEST | SUF- FIX | PLANCHET | CLIENT SAMPLE ID | Thorium 230 | |
|---|---|---|---|---|---|---|
| reparation batch 6160-132 | | | | | | |
| 309052-01 | | | 7885-001 | J178L4-B | U | |
| 309052-02 | | | 7885-002 | J178L5-B | U | |
| 309052-03 | | | 7885-003 | J178L6-B | U | |
| 309052-04 | | | 7885-004 | J178L7 | U | |
| 309052-05 | | | 7885-005 | J178L8 | U | |
| 309052-06 | | | 7885-006 | LCS (QC ID=67205) | ok | |
| 309052-07 | | | 7885-007 | BLK (QC ID=67206) | U | |
| 309052-08 | | | 7885-008 | Duplicate (R809052-01) | - | U |
| ominal values and limits from method | | | | RDLs (pCi/mL) | 1.00 | |
| 18-7 Burial Ground-Other | | | | | | |

## IETHOD PERFORMANCE

| AB AMPLE ID | RAW TEST | SUF- FIX | CLIENT SAMPLE ID | MAX MDA pCi/mL | ALIQ mL | PREP FAC | DILU- TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL- YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| reparation batch 6160-132 2σ prep error 8.0 % Reference Lab Notebook #6160, pg. 132 | | | | | | | | | | | | | | | | |
| 309052-01 | | | J178L4-B | 0.226 | 0.266 | | | 95 | | 326 | | | 31 | 09/17/08 | 09/18 | SS-062 |
| 309052-02 | | | J178L5-B | 0.223 | 0.275 | | | 98 | | 326 | | | 31 | 09/17/08 | 09/18 | SS-063 |
| 309052-03 | | | J178L6-B | 0.336 | 0.276 | | | 101 | | 192 | | | 33 | 09/17/08 | 09/20 | SS-032 |
| 309052-04 | | | J178L7 | 0.331 | 0.251 | | | 98 | | 192 | | | 33 | 09/17/08 | 09/20 | SS-033 |
| 309052-05 | | | J178L8 | 0.410 | 0.250 | | | 99 | | 190 | | | 33 | 09/17/08 | 09/20 | SS-035 |
| 309052-06 | | | LCS (QC ID=67205) | 0.218 | 0.250 | | | 100 | | 190 | | | | 09/17/08 | 09/20 | SS-038 |
| 309052-07 | | | BLK (QC ID=67206) | 0.129 | 0.250 | | | 101 | | 987 | | | | 09/17/08 | 09/22 | SS-063 |
| 309052-08 | | | Duplicate (R809052-01) (QC ID=67207) | 0.322 | 0.266 | | | 98 | | 191 | | | 33 | 09/17/08 | 09/20 | SS-027 |
| ominal values and limits from method | | | | 1.00 | 0.250 | | | 20-110 | | 100 | 100 | | 180 | | | |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/23/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

| | |
|---|---|
| Test | TH |
| Matrix | LIQUID |
| SDG | 7885 |
| Contact | Melissa C. Mannion |

## LAB METHOD SUMMARY, cont.

THORIUM, ISOTOPIC IN LIQUID

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client | Hanford |
| Contract | No. S00W235A00 |
| Contract | SDG K1322 |

| PROCEDURES | REFERENCE | THISO_IE_PLATE_AEA |
|---|---|---|
| | SPP-071 | Soil Dissolution, > 1.0g Aliquot, rev 5 |
| | CP-900 | Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 1 |
| | CP-008 | Heavy Element Electroplating, rev 12 |

| | | | | |
|---|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.274 | ± | 0.180 |
| FOR 8 SAMPLES | YIELD | 99 | ± | 4 |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

Test U Matrix LIQUID
SDG 7885
Contact Melissa C. Mannion

## LAB METHOD SUMMARY

URANIUM IN LIQUID
ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K1322

## .ESULTS

| AB AMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | 1: Uranium 233/234 | 2: Uranium 235 | 3: Uranium 238 | RESULT RATIOS (%) 1+3 | 2σ | 2+3 | 2σ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| :eparation batch 6160-132 | | | | | | | | | | | |
| 309052-01 | | | 7885-001 | J178L4-B | 3.58 | 0.440 | 3.05 | 117 | 34 | 14 | 9 |
| 309052-02 | | | 7885-002 | J178L5-B | 0.258 | U | 0.279 | 92 | 73 | 0 | 19 |
| 309052-03 | | | 7885-003 | J178L6-B | 7.84 | 1.09 | 5.48 | 143 | 28 | 20 | 7 |
| 309052-04 | | | 7885-004 | J178L7 | 0.296 | U | 0.296 | 100 | 72 | 7 | 16 |
| 309052-05 | | | 7885-005 | J178L8 | U | U | U | | | | |
| 309052-06 | | | 7885-006 | LCS (QC ID=67205) | ok | ok | ok | | | | |
| 309052-07 | | | 7885-007 | BLK (QC ID=67206) | U | U | U | | | | |
| 309052-08 | | | 7885-008 | Duplicate (R809052-01) | ok | ok | ok | 140 | 44 | 22 | 12 |
| ominal values and limits from method | | | | RDLs (pCi/mL) | 1.00 | 1.00 | 1.00 | | | | |
| 18-7 Burial Ground-Other | | | | | | | | Averages 119 | | 13 | |

## :ETHOD PERFORMANCE

| AB AMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MAX MDA pCi/mL | ALIQ mL | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| :eparation batch 6160-132 2σ prep error 8.0 % Reference Lab Notebook #6160, pg. 132 | | | | | | | | | | | | | | | | |
| 309052-01 | | | J178L4-B | 0.268 | 0.532 | | | 69 | | 129 | | | 25 | 09/11/08 | 09/12 | SS-032 |
| 309052-02 | | | J178L5-B | 0.199 | 0.549 | | | 75 | | 129 | | | 25 | 09/11/08 | 09/12 | SS-033 |
| 309052-03 | | | J178L6-B | 0.302 | 0.552 | | | 93 | | 129 | | | 25 | 09/11/08 | 09/12 | SS-034 |
| 309052-04 | | | J178L7 | 0.171 | 0.502 | | | 87 | | 131 | | | 25 | 09/11/08 | 09/12 | SS-035 |
| 309052-05 | | | J178L8 | 0.189 | 0.500 | | | 84 | | 132 | | | 25 | 09/11/08 | 09/12 | SS-036 |
| 309052-06 | | | LCS (QC ID=67205) | 0.689 | 0.500 | | | 102 | | 132 | | | | 09/11/08 | 09/12 | SS-038 |
| 309052-07 | | | BLK (QC ID=67206) | 0.325 | 0.500 | | | 66 | | 133 | | | | 09/11/08 | 09/12 | SS-040 |
| 309052-08 | | | Duplicate (R809052-01) (QC ID=67207) | 0.257 | 0.532 | | | 70 | | 133 | | | 25 | 09/11/08 | 09/12 | SS-042 |
| ominal values and limits from method | | | | 1.00 | 0.500 | | | | | 100 | | | 180 | | | |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/23/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

| | |
|---|---|
| Test | U |
| Matrix | LIQUID |
| SDG | 7885 |
| Contact | Melissa C. Mannion |

## LAB METHOD SUMMARY, cont.

URANIUM IN LIQUID

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client | Hanford |
| Contract | No. S00W235A00 |
| Contract | SDG K1322 |

| | | |
|---|---|---|
| PROCEDURES | REFERENCE | UISO_PLATE_AEA |
| | SPP-071 | Soil Dissolution, > 1.0g Aliquot, rev 5 |
| | CP-921 | Uranium in Water and Dissolved Samples by Extraction Chromatography, rev 1 |
| | CP-008 | Heavy Element Electroplating, rev 12 |

| | | | | |
|---|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.300 | ± | 0.333 |
| FOR 8 SAMPLES | YIELD | 81 | ± | 26 |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

Test SR Matrix LIQUID
SDG 7885
Contact Melissa C. Mannion

## LAB METHOD SUMMARY

TOTAL STRONTIUM IN LIQUIDS

BETA COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K1322

## ESULTS

| AB AMPLE ID | RAW TEST | SUF- FIX | PLANCHET | CLIENT SAMPLE ID | Total Strontium |
|---|---|---|---|---|---|
| :eparation batch 6160-132 | | | | | |
| 309052-01 | | | 7885-001 | J178L4-B | U |
| 309052-02 | | | 7885-002 | J178L5-B | U |
| 309052-03 | | | 7885-003 | J178L6-B | U |
| 309052-04 | | | 7885-004 | J178L7 | U |
| 309052-05 | | | 7885-005 | J178L8 | U |
| 309052-06 | | | 7885-006 | LCS (QC ID=67205) | ok |
| 309052-07 | | | 7885-007 | BLK (QC ID=67206) | U |
| 309052-08 | | | 7885-008 | Duplicate (R809052-01) | - U |

ominal values and limits from method RDLs (pCi/mL) 1.00
18-7 Burial Ground-Other

## ETHOD PERFORMANCE

| AB AMPLE ID | RAW TEST | SUF- FIX | CLIENT SAMPLE ID | MDA pCi/mL | ALIQ mL | PREP FAC | DILU- TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL- YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| reparation batch 6160-132 2σ prep error 10.4 % Reference Lab Notebook #6160, pg. 132 | | | | | | | | | | | | | | | | |
| 309052-01 | | | J178L4-B | 0.293 | 1.06 | | | 87 | | 100 | | | 31 | 09/18/08 | 09/18 | GRB-218 |
| 309052-02 | | | J178L5-B | 0.356 | 1.10 | | | 87 | | 100 | | | 31 | 09/18/08 | 09/18 | GRB-222 |
| 309052-03 | | | J178L6-B | 0.272 | 1.10 | | | 92 | | 100 | | | 31 | 09/18/08 | 09/18 | GRB-220 |
| 309052-04 | | | J178L7 | 0.324 | 1.00 | | | 92 | | 100 | | | 31 | 09/18/08 | 09/18 | GRB-225 |
| 309052-05 | | | J178L8 | 0.325 | 1.00 | | | 89 | | 100 | | | 31 | 09/18/08 | 09/18 | GRB-227 |
| 809052-06 | | | LCS (QC ID=67205) | 0.253 | 1.00 | | | 92 | | 100 | | | | 09/18/08 | 09/18 | GRB-222 |
| 809052-07 | | | BLK (QC ID=67206) | 0.350 | 1.00 | | | 88 | | 100 | | | | 09/18/08 | 09/18 | GRB-229 |
| 809052-08 | | | Duplicate (R809052-01) (QC ID=67207) | 0.286 | 1.06 | | | 94 | | 100 | | | 31 | 09/18/08 | 09/18 | GRB-230 |
| ominal values and limits from method | | | | 1.00 | 1.00 | | | | | 100 | | | 180 | | | |

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/23/08

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

| | |
|---|---|
| Test SR | Matrix LIQUID |
| SDG 7885 | |
| Contact Melissa C. Mannion | |

## LAB METHOD SUMMARY, cont.

TOTAL STRONTIUM IN LIQUIDS

BETA COUNTING

| | |
|---|---|
| Client Hanford | |
| Contract No. S00W235A00 | |
| Contract SDG K1322 | |

| | | |
|---|---|---|
| PROCEDURES | REFERENCE | SRTOT_SEP_PRECIP_GPC |
| | SPP-071 | Soil Dissolution, > 1.0g Aliquot, rev 5 |
| | CP-383 | Strontium in Dissolved Solid of < 5.0g Aliquot, rev 1 |

| | | | | |
|---|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 0.307 | ± | 0.074 |
| FOR 8 SAMPLES | YIELD | 90 | ± | 5 |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

| | |
|---|---|
| Test 93A | Matrix LIQUID |
| SDG 7885 | |
| Contact Melissa C. Mannion | |

## LAB METHOD SUMMARY

GROSS ALPHA IN LIQUID

GAS PROPORTIONAL COUNTING

| | |
|---|---|
| Client Hanford | |
| Contract No. S00W235A00 | |
| Contract SDG K1322 | |

## ESULTS

| LB AMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Gross Alpha |
|---|---|---|---|---|---|
| :eparation batch 6160-132 | | | | | |
| 109052-01 | 93 | | 7885-001 | J178L4-B | 7.46 |
| 109052-02 | 93 | | 7885-002 | J178L5-B | U |
| 109052-03 | 93 | | 7885-003 | J178L6-B | 17.9 |
| 109052-04 | 93 | | 7885-004 | J178L7 | U |
| 109052-05 | 93 | | 7885-005 | J178L8 | U |
| 109052-06 | 93 | | 7885-006 | LCS (QC ID=67205) | ok |
| 109052-07 | 93 | | 7885-007 | BLK (QC ID=67206) | U |
| 109052-08 | 93 | | 7885-008 | Duplicate (R809052-01) | ok |

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

18-7 Burial Ground-Other

## :ETHOD PERFORMANCE

| LB AMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/mL | ALIQ mL | PREP FAC | DILU-TION | RESID mg | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| :eparation batch 6160-132 | | | 2σ prep error 20.6 % Reference Lab Notebook #6160, pg. 132 | | | | | | | | | | | | | |
| 309052-01 | 93 | | J178L4-B | 2.42 | 0.106 | | | 1 | | 100 | | | 28 | 09/13/08 | 09/15 | GRB-103 |
| 309052-02 | 93 | | J178L5-B | 2.09 | 0.110 | | | 0 | | 100 | | | 28 | 09/13/08 | 09/15 | GRB-104 |
| 309052-03 | 93 | | J178L6-B | 2.01 | 0.111 | | | 0 | | 100 | | | 28 | 09/13/08 | 09/15 | GRB-105 |
| 309052-04 | 93 | | J178L7 | 2.02 | 0.100 | | | 0 | | 100 | | | 28 | 09/13/08 | 09/15 | GRB-107 |
| 309052-05 | 93 | | J178L8 | 2.15 | 0.100 | | | 0 | | 100 | | | 29 | 09/13/08 | 09/16 | GRB-114 |
| 309052-06 | 93 | | LCS (QC ID=67205) | 8.54 | 0.100 | | | 60 | | 100 | | | | 09/13/08 | 09/15 | GRB-213 |
| 309052-07 | 93 | | BLK (QC ID=67206) | 7.68 | 0.100 | | | 61 | | 100 | | | | 09/13/08 | 09/15 | GRB-214 |
| 309052-08 | 93 | | Duplicate (R809052-01) (QC ID=67207) | 2.74 | 0.106 | | | 1 | | 100 | | | 28 | 09/13/08 | 09/15 | GRB-216 |
| ominal values and limits from method | | | | 10.0 | 0.100 | | | 5-250 | | 100 | | | 180 | | | |

| | | |
|---|---|---|
| PROCEDURES | REFERENCE | 900.0_ALPHABETA_GPC |
| | SPP-071 | Soil Dissolution, > 1.0g Aliquot, rev 5 |
| | SPP-120 | Gross Alpha and Gross Beta in Water, rev 0 |

| | | | |
|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 3.71 | ± 5.48 |
| FOR 8 SAMPLES | RESIDUE | 15 | ± 56 |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

| | |
|---|---|
| Test 93B | Matrix LIQUID |
| SDG 7885 | |
| Contact Melissa C. Mannion | |

## LAB METHOD SUMMARY

GROSS BETA IN LIQUID

GAS PROPORTIONAL COUNTING

| | |
|---|---|
| Client | Hanford |
| Contract | No. S00W235A00 |
| Contract | SDG K1322 |

## ESULTS

| AB AMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Gross Beta |
|---|---|---|---|---|---|
| :eparation batch 6160-132 | | | | | |
| 109052-01 | 93 | | 7885-001 | J178L4-B | 8.48 |
| 109052-02 | 93 | | 7885-002 | J178L5-B | U |
| 109052-03 | 93 | | 7885-003 | J178L6-B | 9.80 |
| 109052-04 | 93 | | 7885-004 | J178L7 | U |
| 109052-05 | 93 | | 7885-005 | J178L8 | U |
| 109052-06 | 93 | | 7885-006 | LCS (QC ID=67205) | ok |
| 109052-07 | 93 | | 7885-007 | BLK (QC ID=67206) | U |
| 109052-08 | 93 | | 7885-008 | Duplicate (R809052-01) | ok U |

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

.8-7 Burial Ground-Other

## ETHOD PERFORMANCE

| AB AMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MDA pCi/mL | ALIQ mL | PREP FAC | DILU-TION | RESID mg | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| :eparation batch 6160-132 2σ prep error 11.0 % Reference Lab Notebook #6160, pg. 132 | | | | | | | | | | | | | | | | |
| 109052-01 | 93 | | J178L4-B | 6.31 | 0.106 | | | 1 | | 100 | | | 28 | 09/13/08 | 09/15 | GRB-103 |
| 109052-02 | 93 | | J178L5-B | 4.40 | 0.110 | | | 0 | | 100 | | | 28 | 09/13/08 | 09/15 | GRB-104 |
| 109052-03 | 93 | | J178L6-B | 5.02 | 0.111 | | | 0 | | 100 | | | 28 | 09/13/08 | 09/15 | GRB-105 |
| 109052-04 | 93 | | J178L7 | 8.46 | 0.100 | | | 0 | | 100 | | | 28 | 09/13/08 | 09/15 | GRB-107 |
| 109052-05 | 93 | | J178L8 | 7.05 | 0.100 | | | 0 | | 100 | | | 29 | 09/13/08 | 09/16 | GRB-114 |
| 109052-06 | 93 | | LCS (QC ID=67205) | 8.87 | 0.100 | | | 60 | | 100 | | | | 09/13/08 | 09/15 | GRB-213 |
| 109052-07 | 93 | | BLK (QC ID=67206) | 8.64 | 0.100 | | | 61 | | 100 | | | | 09/13/08 | 09/15 | GRB-214 |
| 109052-08 | 93 | | Duplicate (R809052-01) (QC ID=67207) | 5.10 | 0.106 | | | 1 | | 100 | | | 28 | 09/13/08 | 09/15 | GRB-216 |
| ominal values and limits from method | | | | 15.0 | 0.100 | | | 5-250 | | 100 | | | 180 | | | |

| | | |
|---|---|---|
| PROCEDURES | REFERENCE | 900.0_ALPHABETA_GPC |
| | SPP-071 | Soil Dissolution, > 1.0g Aliquot, rev 5 |
| | SPP-120 | Gross Alpha and Gross Beta in Water, rev 0 |

| | | | |
|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 6.73 | ± 3.59 |
| FOR 8 SAMPLES | RESIDUE | 15 | ± 56 |

| | |
|---|---|
| Lab id | EBRLNE |
| Protocol | Hanford1 |
| Version | Ver 1.0 |
| Form | DVD-LMS |
| Version | 3.06 |
| Report date | 09/23/08 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K1322

Test GAM Matrix LIQUID
SDG 7885
Contact Melissa C. Mannion

## LAB METHOD SUMMARY

GAMMA SCAN IN LIQUID

GAMMA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K1322

## .ESULTS

| AB AMPLE ID | RAW TEST | SUF-FIX | PLANCHET | CLIENT SAMPLE ID | Cobalt 60 | | Cesium 137 | |
|---|---|---|---|---|---|---|---|---|
| reparation batch 6160-132 | | | | | | | | |
| 309052-01 | | | 7885-001 | J178L4-B | U | | U | |
| 309052-02 | | | 7885-002 | J178L5-B | U | | U | |
| 309052-03 | | | 7885-003 | J178L6-B | U | | U | |
| 309052-04 | | | 7885-004 | J178L7 | U | | U | |
| 309052-05 | | | 7885-005 | J178L8 | U | | U | |
| 309052-06 | | | 7885-006 | LCS (QC ID=67205) | ok | | ok | |
| 309052-07 | | | 7885-007 | BLK (QC ID=67206) | U | | U | |
| 309052-08 | | | 7885-008 | Duplicate (R809052-01) | - | U | - | U |
| ominal values and limits from method | | | | RDLs (pCi/mL) | 0.050 | | 0.050 | |
| 18-7 Burial Ground-Other | | | | | | | | |

## IETHOD PERFORMANCE

| AB AMPLE ID | RAW TEST | SUF-FIX | CLIENT SAMPLE ID | MAX MDA pCi/mL | ALIQ mL | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| reparation batch 6160-132 | | | 2σ prep error 7.0 % Reference Lab Notebook #6160, pg. 132 | | | | | | | | | | | | | |
| 309052-01 | | | J178L4-B | 0.111 | 101 | | | | | 911 | | | 23 | 09/09/08 | 09/10 | JR,08,00 |
| 309052-02 | | | J178L5-B | 0.071 | 101 | | | | | 893 | | | 23 | 09/09/08 | 09/10 | JR,06,00 |
| 309052-03 | | | J178L6-B | 0.068 | 100 | | | | | 950 | | | 24 | 09/09/08 | 09/11 | JR,06,00 |
| 309052-04 | | | J178L7 | 0.037 | 100 | | | | | 950 | | | 24 | 09/09/08 | 09/11 | JR,07,00 |
| 809052-05 | | | J178L8 | 0.052 | 100 | | | | | 950 | | | 24 | 09/09/08 | 09/11 | JR,08,00 |
| 809052-06 | | | LCS (QC ID=67205) | 0.107 | 100 | | | | | 408 | | | | 09/09/08 | 09/15 | JR,04,00 |
| 809052-07 | | | BLK (QC ID=67206) | 0.080 | 100 | | | | | 408 | | | | 09/09/08 | 09/15 | JR,08,00 |
| 809052-08 | | | Duplicate (R809052-01) (QC ID=67207) | 0.099 | 101 | | | | | 408 | | | 28 | 09/09/08 | 09/15 | JR,06,00 |
| ominal values and limits from method | | | | 0.050 | 100 | | | | | 100 | | | 180 | | | |

PROCEDURES REFERENCE GAMMA_GS
SPP-100 Ge(Li) Preparation for Commercial Samples, rev 7

AVERAGES ± 2 SD FOR 8 SAMPLES
MDA 0.078 ± 0.053
YIELD ____ ± ____

Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/23/08

SDG 7885
Contact Melissa C. Mannion

# REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

## 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/23/08

SDG 7885
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

# 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/23/08

SDG 7885
Contact Melissa C. Mannion

# REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1322

## 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/23/08

SDG 7885
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1322

# 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).



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/23/08

# 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.

SDG 7885
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG_K1322

# 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/23/08

SDG 7885
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

# 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/23/08

SDG 7885
Contact Melissa C. Mannion

# REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K1322

## 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
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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.

SDG 7885
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

# 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



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
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SDG 7885
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

# 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.



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/23/08

SDG 7885
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K1322

# 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'



Lab id EBRLNE
Protocol Hanford1
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/23/08

## 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.

* Prepareation 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.

# 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

## 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.

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-088-062 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Collector** B. Lawrence | **Company Contact** Joan Kessner | **Telephone No.** 509-375-4688 | **Project Coordinator** KESSNER, JH |
| **Price Code** | **Data Turnaround** 15 Days | | |
| **Project Designation** 618-7 Burial Ground - Other | **Sampling Location** 618-7 Burial Ground (drums) K1322 (7885) | | **SAF No.** RC-088 |
| **Ice Chest No.** Fiberboard Box | **Field Logbook No.** EL-1395-13 | **COA** RG61878500 | **Method of Shipment** Expedited Ground |
| **Shipped To** EBERLINE SERVICES / MONVILLE | **Offsite Property No.** see HSMR | | **Bill of Lading/Air Bill No.** see HSMR |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radioactive contamination, potential beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Preservation** | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | | | |
| **Type of Container** | aG | aG | aG | P | P | P | | | | | |
| **No. of Container(s)** | 1 | 1 | 0 | 0 | 0 | 1 | | | | | |
| **Volume** | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | | | |
| **SAMPLE ANALYSIS** other liquid | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. | | | | | PINH |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| J178L4 - B | OTHER | 8/18/08 | 0900 | | | | | | X | | 5901 |
| J178L5 | OTHER | | 0915 | | | | | | X | | 5975 |
| J178L6 | OTHER | | 0940 | | | | | | X | | 5954 |
| J178L7 | OTHER | | 0950 | | | | | | X | | 5952 |
| J178L8 | OTHER | 8/18/08 | 1020 | | | | | | X | | 5777 |

PTC 8/18/08

NW 9/3/08

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| B Lawrence | 1300 8-14-08 | R. Fahlberg R. Fahlberg | 1300 8-14-08 |
| R Fahlberg R. Fahlberg | 1500 8-19-08 | R T COFFMAN / R T Coffman | 1500 8/19/08 |
| R T COFFMAN / R T Coffman | 1215 9/3/08 | M Stankovich | 1215 9/3/08 |
| M Stankovich | 1200 9/3/08 | Ground | |
| 4K HARBOR | | PW 09/05/08 | 14:00 |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) (Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc); ICP Metals - 6010A (Add-on) (Arsenic, Lead, Selenium, Thallium, Tin, Zirconium); Mercury - 7471 - (CV)

(2) Gross Alpha; Gross Beta; Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Uranium; Isotopic Thorium; Americium-241; Isotopic Plutonium; Strontium-89,90 -- Total Sr

**Matrix ***

S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | Received By | Title | Date/Time |
| **FINAL SAMPLE DISPOSITION** | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

Hanford Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-088-062



| | | | |
|---|---|---|---|
| **Collector** B. Lawrence | **Company Contact** Joan Kessner | **Telephone No.** 509-375-4688 | **Project Coordinator** KESSNER, JH |
| **Price Code** | **Data Turnaround** 15 Days | | |
| **Project Designation** 618-7 Burial Ground - Other | **Sampling Location** 618-7 Burial Ground (drums) K1322 (7885) | | **SAF No.** RC-088 |
| **Ice Chest No.** Fiberboard Box | **Field Logbook No.** EL-1395-13 | **COA** RG61878500 | **Method of Shipment** Expedited Ground |
| **Shipped To** EBERLINE SERVICES / LIONVILLE | **Offsite Property No.** see HSMR | | **Bill of Lading/Air Bill No.** see HSMR |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radioactive contamination, potential beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Preservation** | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | | |
| **Type of Container** | aG | aG | aG | P | P | P | | | | |
| **No. of Container(s)** | 1 | 1 | 0 | 0 | 0 | 1 | | | | |
| **Volume** | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | | |
| **SAMPLE ANALYSIS** | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. | | | | PIN # |

PK 8/18/08

Other liquid

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~J178L4~~ no 9/3/08 | ~~OTHER~~ | 8/18/08 | 0900 | | | | | | X | | | 5901 |
| J178L5 — B | OTHER | | 0915 | | | | | | X | | | 5475 |
| J178L6 — B | OTHER | | 0940 | | | | | | X | | | 5954 |
| J178L7 | OTHER | | 0950 | | | | | | X | | | 5952 |
| J178L8 | OTHER | 8/18/08 | 1020 | | | | | | X | | | 5777 |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From B Lawrence | 1300 8-14-08 | Received By/Stored In B. Fahlberg R. Fahlberg | 1300 8-19-08 |
| Relinquished By/Removed From B. Fahlberg R. Fahlberg | 1500 8-19-08 | Received By/Stored In R T COFFMAN / R T Coffman | 1500 8/19/08 |
| Relinquished By/Removed From R T COFFMAN / R T Coffman | 1215 9/3/08 | Received By/Stored In M Stankovich | 1215 9/3/08 |
| Relinquished By/Removed From WCH M Stankovich | 1215 9/3/08 | Received By/Stored In Ground | |
| Relinquished By/Removed From OAK HARBOR | | Received By/Stored In | 09/05/08 14:50 |
| Relinquished By/Removed From | | Received By/Stored In | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Arsenic, Lead, Selenium, Thallium, Tin, Zirconium}; Mercury - 7471 - (CV)

(2) Gross Alpha; Gross Beta; Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Uranium; Isotopic Thorium; Americium-241; Isotopic Plutonium; Strontium-89,90 -- Total Sr

Matrix *

S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | Received By | Title | Date/Time |
| **FINAL SAMPLE DISPOSITION** | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

EBERLINE

# RICHMOND, CA LABORATORY

## SAMPLE RECEIPT CHECKLIST

SK 9/8/08

Client: W.C. HANFORD City RICHLAND State WA

Date/Time received 09/05/08 14:02 CoC No. RC-088-06 V

Container I.D. No. HAZMAT BOX Requested TAT (Days) 15 P.D. Received Yes [ ] No [ ]

### INSPECTION

1 Custody seals on shipping container intact? Yes [X] No [ ] N/A [ ]

2 Custody seals on shipping container dated & signed? Yes [X] No [ ] N/A [ ]

3 Custody seals on sample containers intact? Yes [X] No [ ] N/A [ ]

4 Custody seals on sample containers dated & signed? Yes [X] No [ ] N/A [ ]

5 Packing material is: Wet [ ] Dry [X]

6 Number of samples in shipping container 5 Sample Matrix X LIQUID

7 Number of containers per sample 1 (Or see CoC ____ )

8 Samples are in correct container Yes [X] No [ ]

9 Paperwork agrees with samples? Yes [X] No [ ]

10 Samples have Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [X]

11 Samples are In good condition [X] Leaking [ ] Broken Container [ ] Missing [ ]

12 Samples are Preserved [ ] Not preserved [ ] pH ____ Preservative ____

13 Describe any anomalies:

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

15. Inspected by [signature] Date 09/08/08 Time 08:00

| Customer Sample No. | Beta/Gamma cpm | Ion Chamber mR/hr | Wipe | Customer Sample No | Beta/Gamma cpm | Ion Chamber mR/hr | wipe |
|---|---|---|---|---|---|---|---|
| ALL SAMPLES | <60 | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Ion Chamber Ser. No ____ Calibration date ____

Alpha Meter Ser. No ____ Calibration date ____

Beta/Gamma Meter Ser. No. 10048 V Calibration date 10-JULY 08

LvLI
LIONVILLE LABORATORY INC.

RECEIVED
OCT 2008

30 September 2008

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H9-03
Richland, WA 99354

**Subject:** Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

| | |
|---|---|
| LvLI Batch # | 0809L076 |
| SDG # | K1322 |
| SAF # | RC-088 |
| Date Received | 9/10/08 |
| # Samples | 5 |
| Matrix | OTHER |
| Volatiles | X |
| Semivolatiles | X |
| Pest/PCB | X |
| Glycols | |
| DRO/KRO/GRO | |
| GC Alcohols | |
| Herbicides | |
| Metals | X |
| Inorganics | X |

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager
r:\group\pm\orlette\hanford\data\b_ltrs.doc

RECEIVED
OCT 2008

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-088 K1322

DATE RECEIVED: 09/10/08 LVL LOT # :0809L076

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| J178L4 | | | | | | |
| SILVER, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SILVER, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SILVER, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ALUMINUM, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ALUMINUM, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ALUMINUM, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ARSENIC, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ARSENIC, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ARSENIC, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BARIUM, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BARIUM, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BARIUM, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BERYLLIUM, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BERYLLIUM, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BERYLLIUM, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CALCIUM, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CALCIUM, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CALCIUM, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CADMIUM, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CADMIUM, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CADMIUM, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COBALT, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COBALT, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COBALT, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CHROMIUM, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CHROMIUM, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CHROMIUM, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COPPER, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COPPER, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COPPER, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| IRON, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| IRON, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| IRON, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MERCURY, TOTAL | 001 | OI | 08C0160 | 08/18/08 | 09/15/08 | 09/16/08 |
| MERCURY, TOTAL | 001 REP | OI | 08C0160 | 08/18/08 | 09/15/08 | 09/16/08 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-088 K1322

DATE RECEIVED: 09/10/08 LVL LOT # :0809L076

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| MERCURY, TOTAL | 001 MS | OI | 08C0160 | 08/18/08 | 09/15/08 | 09/16/08 |
| POTASSIUM, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| POTASSIUM, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| POTASSIUM, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MAGNESIUM, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MAGNESIUM, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MAGNESIUM, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MANGANESE, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MANGANESE, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MANGANESE, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SODIUM, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SODIUM, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SODIUM, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| NICKEL, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| NICKEL, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| NICKEL, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| LEAD, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| LEAD, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| LEAD, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ANTIMONY, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ANTIMONY, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ANTIMONY, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SELENIUM, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SELENIUM, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SELENIUM, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| TIN, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| TIN, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| TIN, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| THALLIUM, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| THALLIUM, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| THALLIUM, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| VANADIUM, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| VANADIUM, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| VANADIUM, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ZINC, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ZINC, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ZINC, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ZIRCONIUM, TOTAL | 001 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-088 K1322

DATE RECEIVED: 09/10/08 LVL LOT # :0809L076

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| ZIRCONIUM, TOTAL | 001 REP | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ZIRCONIUM, TOTAL | 001 MS | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| J178L5 | | | | | | |
| SILVER, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ALUMINUM, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ARSENIC, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BARIUM, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BERYLLIUM, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CALCIUM, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CADMIUM, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COBALT, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CHROMIUM, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COPPER, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| IRON, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MERCURY, TOTAL | 002 | OI | 08C0160 | 08/18/08 | 09/15/08 | 09/16/08 |
| POTASSIUM, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MAGNESIUM, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MANGANESE, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SODIUM, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| NICKEL, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| LEAD, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ANTIMONY, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SELENIUM, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| TIN, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| THALLIUM, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| VANADIUM, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ZINC, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ZIRCONIUM, TOTAL | 002 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| J178L6 | | | | | | |
| SILVER, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ALUMINUM, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ARSENIC, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BARIUM, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BERYLLIUM, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-088 K1322

DATE RECEIVED: 09/10/08 LVL LOT # :0809L076

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| CALCIUM, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CADMIUM, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COBALT, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CHROMIUM, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COPPER, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| IRON, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MERCURY, TOTAL | 003 | OI | 08C0160 | 08/18/08 | 09/15/08 | 09/16/08 |
| POTASSIUM, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MAGNESIUM, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MANGANESE, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SODIUM, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| NICKEL, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| LEAD, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ANTIMONY, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SELENIUM, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| TIN, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| THALLIUM, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| VANADIUM, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ZINC, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ZIRCONIUM, TOTAL | 003 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| J178L7 | | | | | | |
| SILVER, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ALUMINUM, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ARSENIC, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BARIUM, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BERYLLIUM, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CALCIUM, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CADMIUM, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COBALT, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CHROMIUM, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COPPER, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| IRON, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MERCURY, TOTAL | 004 | OI | 08C0160 | 08/18/08 | 09/15/08 | 09/16/08 |
| POTASSIUM, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MAGNESIUM, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MANGANESE, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-088 K1322

DATE RECEIVED: 09/10/08 LVL LOT # :0809L076

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| SODIUM, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| NICKEL, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| LEAD, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ANTIMONY, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SELENIUM, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| TIN, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| THALLIUM, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| VANADIUM, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ZINC, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ZIRCONIUM, TOTAL | 004 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| J178L8 | | | | | | |
| SILVER, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ALUMINUM, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ARSENIC, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BARIUM, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| BERYLLIUM, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CALCIUM, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CADMIUM, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COBALT, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| CHROMIUM, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| COPPER, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| IRON, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MERCURY, TOTAL | 005 | OI | 08C0160 | 08/18/08 | 09/15/08 | 09/16/08 |
| POTASSIUM, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MAGNESIUM, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| MANGANESE, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SODIUM, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| NICKEL, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| LEAD, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ANTIMONY, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| SELENIUM, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| TIN, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| THALLIUM, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| VANADIUM, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ZINC, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |
| ZIRCONIUM, TOTAL | 005 | OI | 08L0335 | 08/18/08 | 09/15/08 | 09/16/08 |

AB QC:

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-088 K1322

DATE RECEIVED: 09/10/08 LVL LOT # :0809L076

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| SILVER LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| SILVER, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| ALUMINUM LABORTORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| ALUMINUM, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| ARSENIC LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| ARSENIC, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| BARIUM LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| BARIUM, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| BERYLLIUM LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| BERYLLIUM, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| CALCIUM LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| CALCIUM, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| CADMIUM LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| CADMIUM, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| COBALT LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| COBALT, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| CHROMIUM LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| CHROMIUM, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| COPPER LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| COPPER, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| IRON LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| IRON, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| MERCURY LABORATORY | LC1 BS | S | 08C0160 | N/A | 09/15/08 | 09/16/08 |
| MERCURY, TOTAL | MB1 | S | 08C0160 | N/A | 09/15/08 | 09/16/08 |
| POTASSIUM LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| POTASSIUM, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| MAGNESIUM LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| MAGNESIUM, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| MANGANESE LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| MANGANESE, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| SODIUM LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| SODIUM, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| NICKEL LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| NICKEL, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| LEAD LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-088 K1322

DATE RECEIVED: 09/10/08 LVL LOT # :0809L076

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| LEAD, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| ANTIMONY LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| ANTIMONY, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| SELENIUM LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| SELENIUM, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| TIN LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| TIN, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| THALLIUM LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| THALLIUM, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| VANADIUM LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| VANADIUM, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| ZINC LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| ZINC, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| ZIRCONIUM LABORATORY | LC1 BS | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |
| ZIRCONIUM, TOTAL | MB1 | S | 08L0335 | N/A | 09/15/08 | 09/16/08 |

LIONVILLE LABORATORY INC.

## Analytical Report

**Client:** WC-HANFORD RC-088
**LVL#:** 0809L076
**SDG/SAF#:** K1322/RC-088

**W.O.#:** 60049-001-001-0001-00
**Date Received:** 09-10-08

### METALS CASE NARRATIVE

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvLI) certifies that all test results meet the requirements of NELAC except as noted below.

1. This narrative covers the analyses of 5 oil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The sample results were reported on a wet weight "as received" basis.

   Samples J178L4, J178L5, and J178L6 were run with 5-fold dilutions for Mercury due to sample matrix.

   All samples were run on a different instrument for Aluminum.

3. The ICP metals analyses were performed within the required holding times. The analysis for Mercury was performed outside the required holding time. Please refer to the Sample Discrepancy Report (SDR)#: 08MR003A.

4. Please refer to the Sample Receipt Check List for sample discrepancies in LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury) with the exception of Sodium and Potassium in file TA0916A. All samples were rerun and reported for Potassium and Sodium in file PS0916B along with Aluminum.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the LOQ).

7. The preparation/method blank for 1 analyte was outside method criteria. {less than the Limit of Quantitation (3-10X the LOD), the samples read greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

   a.) Sample J178L4 in this preparation batch were found to contain Sodium at concentrations greater than 20X the preparation blank.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 29 pages.

b). The MB 08L0335 result for Sodium was greater than the Limit of Quantitation (LOQ) {3-10x the (LOD) Limit of Detection} The samples J178L5, J178L6, J178L7, and J178L8 read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

| Sample ID | Element | PDS Concentration (ppb) | PDS % Recovery |
|---|---|---|---|
| J178L4 | Iron | 10,000 | 97.9 |

12. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.

14. LvLI is NELAP accredited by the state of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

9/16/08
Date

LIONVILLE LABORATORY INC.

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 08MR003A

Initiator: T. BRIDGES
Date: 9/17/08
Client: WCHANford

Batch: 0809L070
Samples: 001-005
Method: SW846/MCAWW/CLP/

Parameter: Hg
Matrix: oil
Prep Batch: HG-0916 01

**1. Reason for SDR**

**a. COC Discrepancy**
__ Tech Profile Error __ Client Request __ Sampler Error on C-O-C
__ Transcription Error __ Wrong Test Code __ Other _____

**b. General Discrepancy**
__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
X Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

**c. Problem** (Include all relevant specific results; attach data if necessary)

Samples analyzed out of hold

**2. Known or Probable Causes(s)**

analyst did not notice samples were received 23 days into hold

**3. Discussion and Proposed Action**

Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

narrate + report

**4. Project Manager Instructions**...signature/date: 9/17/08

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
✓ Client Contacted:
Date/Person Joan Kessner 9/17/08
__ Add
__ Cancel

**5. Final Action**...signature/date: _____

Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
X Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

**When Final Action has been recorded, forward original to QA for diposition.**

Route
__ Lab Manager: Daniels
__ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

# METALS METHOD GLOSSARY

: following methods are used as reference for the digestion and analysis of samples contained within t

#: 08091076

ching Procedure: __1310 __1311 __1312 __Other:_____

P Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

tals Digestion Methods: __3005A __3010A __3015 __3020A ✓3050B __3051 __200.7 __SS17
__Other: _____

## Metals Analysis Methods

| | SW846 | | EPA | | STD MTD | EPA OSWR | USATHAMA |
|---|---|---|---|---|---|---|---|
| uminum | ✓6010B | | __200.7 | | | | __99 |
| timony | ✓6010B | __7041 [5] | __200.7 | __204.2 | | | __99 |
| senic | ✓6010B | __7060A [5] | __200.7 | __206.2 | __3113B | | __99 |
| rium | ✓6010B | | __200.7 | | | | __99 |
| ryllium | ✓6010B | | __200.7 | | | | __99 |
| smuth | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| oron | __6010B | | __200.7 | | | | __99 |
| dmium | ✓6010B | __7131A [5] | __200.7 | __213.2 | | | __99 |
| lcium | ✓6010B | | __200.7 | | | | __99 |
| hromium | ✓6010B | __7191 [5] | __200.7 | __218.2 | | | __SS17 |
| obalt | ✓6010B | | __200.7 | | | | __99 |
| opper | ✓6010B | __7211 [5] | __200.7 | __220.2 | | | __99 |
| on | ✓6010B | | __200.7 | | | | __99 |
| ead | ✓6010B | __7421 [5] | __200.7 | __239.2 | __3113B | | __99 |
| ithium | __6010B | __7430 [4] | __200.7 | | | __1620 | __99 |
| agnesium | ✓6010B | | __200.7 | | | | __99 |
| anganese | ✓6010B | | __200.7 | | | | __99 |
| ercury | __7470A [3] | ✓__7471A [3] | __245.1 [2] | __245.5 [2] | | | __99 |
| olybdenum | __6010B | | __200.7 | | | | __99 |
| ickel | ✓6010B | | __200.7 | | | | __99 |
| otassium | ✓6010B | __7610 [4] | __200.7 | __258.1 [4] | | | __99 |
| are Earths | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| elenium | ✓6010B | __7740 [5] | __200.7 | __270.2 | __3113B | | __99 |
| ilicon | __6010B [1] | | __200.7 | | | __1620 | __99 |
| ilica | __6010B | | __200.7 | | | __1620 | __99 |
| ilver | ✓6010B | __7761 [5] | __200.7 | __272.2 | | | __99 |
| odium | ✓6010B | __7770 [4] | __200.7 | __273.1 [4] | | | __99 |
| trontium | __6010B | | __200.7 | | | | __99 |
| hallium | ✓6010B | __7841 [5] | __200.7 | __279.2 | __200.9 | | __99 |
| in | ✓6010B | | __200.7 | | | | __99 |
| itanium | __6010B | | __200.7 | | | | __99 |
| ranium | __6010B [1] | | __200.7 [1] | | | __1620 | __99 |
| anadium | ✓6010B | | __200.7 | | | | __99 |
| inc | ✓6010B | | __200.7 | | | | __99 |
| irconium | ✓6010B [1] | | __200.7 [1] | | | __1620 | __99 |

Method: _____

# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

## ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

## ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Flame AA.

4. Graphite Furnace AA.

L-WI-033/N-04/98

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/17/08

CLIENT: WC-HANFORD RC-088 K1322 LVL LOT #: 0809L076

WORK ORDER: 60049-001-001-0001-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| -001 | J178L4 | Silver, Total | 0.1 | u | MG/KG | 0.1 | 1.0 |
| | | Aluminum, Total | 17.4 | | MG/KG | 4.0 | 1.0 |
| | | Arsenic, Total | 0.62 | | MG/KG | 0.50 | 1.0 |
| | | Barium, Total | 552 | | MG/KG | 0.1 | 1.0 |
| | | Beryllium, Total | 2.6 | | MG/KG | 0.05 | 1.0 |
| | | Calcium, Total | 396 | | MG/KG | 4.0 | 1.0 |
| | | Cadmium, Total | 0.61 | | MG/KG | 0.05 | 1.0 |
| | | Cobalt, Total | 5.5 | | MG/KG | 0.20 | 1.0 |
| | | Chromium, Total | 0.46 | | MG/KG | 0.20 | 1.0 |
| | | Copper, Total | 2.4 | | MG/KG | 0.20 | 1.0 |
| | | Iron, Total | 1200 | | MG/KG | 4.5 | 1.0 |
| | | Mercury, Total | 0.05 | u | MG/KG | 0.05 | 5.0 |
| | | Potassium, Total | 48.8 | u | MG/KG | 48.8 | 1.0 |
| | | Magnesium, Total | 60.2 | | MG/KG | 2.5 | 1.0 |
| | | Manganese, Total | 7.3 | | MG/KG | 0.04 | 1.0 |
| | | Sodium, Total | 1910 | | MG/KG | 2.0 | 1.0 |
| | | Nickel, Total | 0.39 | | MG/KG | 0.20 | 1.0 |
| | | Lead, Total | 0.77 | | MG/KG | 0.30 | 1.0 |
| | | Antimony, Total | 0.30 | u | MG/KG | 0.30 | 1.0 |
| | | Selenium, Total | 0.59 | u | MG/KG | 0.59 | 1.0 |
| | | Tin, Total | 0.60 | | MG/KG | 0.59 | 1.0 |
| | | Thallium, Total | 0.59 | u | MG/KG | 0.59 | 1.0 |
| | | Vanadium, Total | 0.14 | u | MG/KG | 0.14 | 1.0 |
| | | Zinc, Total | 131 | | MG/KG | 0.59 | 1.0 |
| | | Zirconium, Total | 5.0 | u | MG/KG | 5.0 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/17/08

CLIENT: WC-HANFORD RC-088 K1322 LVL LOT #: 0809L076

WORK ORDER: 60049-001-001-0001-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| -002 | J178L5 | Silver, Total | 0.09 | u | MG/KG | 0.09 | 1.0 |
| | | Aluminum, Total | 3.7 | u | MG/KG | 3.7 | 1.0 |
| | | Arsenic, Total | 0.46 | u | MG/KG | 0.46 | 1.0 |
| | | Barium, Total | 565 | | MG/KG | 0.09 | 1.0 |
| | | Beryllium, Total | 0.92 | | MG/KG | 0.05 | 1.0 |
| | | Calcium, Total | 74.1 | | MG/KG | 3.7 | 1.0 |
| | | Cadmium, Total | 0.14 | | MG/KG | 0.05 | 1.0 |
| | | Cobalt, Total | 0.19 | u | MG/KG | 0.19 | 1.0 |
| | | Chromium, Total | 0.25 | | MG/KG | 0.19 | 1.0 |
| | | Copper, Total | 0.86 | | MG/KG | 0.19 | 1.0 |
| | | Iron, Total | 63.6 | | MG/KG | 4.2 | 1.0 |
| | | Mercury, Total | 0.05 | u | MG/KG | 0.05 | 5.0 |
| | | Potassium, Total | 45.6 | u | MG/KG | 45.6 | 1.0 |
| | | Magnesium, Total | 6.7 | | MG/KG | 2.3 | 1.0 |
| | | Manganese, Total | 1.3 | | MG/KG | 0.04 | 1.0 |
| | | Sodium, Total | 49.9 | | MG/KG | 1.9 | 1.0 |
| | | Nickel, Total | 0.19 | u | MG/KG | 0.19 | 1.0 |
| | | Lead, Total | 0.43 | | MG/KG | 0.28 | 1.0 |
| | | Antimony, Total | 0.28 | u | MG/KG | 0.28 | 1.0 |
| | | Selenium, Total | 0.56 | u | MG/KG | 0.56 | 1.0 |
| | | Tin, Total | 0.62 | | MG/KG | 0.56 | 1.0 |
| | | Thallium, Total | 0.56 | u | MG/KG | 0.56 | 1.0 |
| | | Vanadium, Total | 0.13 | u | MG/KG | 0.13 | 1.0 |
| | | Zinc, Total | 137 | | MG/KG | 0.56 | 1.0 |
| | | Zirconium, Total | 4.6 | u | MG/KG | 4.6 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/17/08

CLIENT: WC-HANFORD RC-088 K1322 LVL LOT #: 0809L076

WORK ORDER: 60049-001-001-0001-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| -003 | J178L6 | Silver, Total | 0.1 | u | MG/KG | 0.1 | 1.0 |
| | | Aluminum, Total | 7.2 | | MG/KG | 3.9 | 1.0 |
| | | Arsenic, Total | 0.49 | u | MG/KG | 0.49 | 1.0 |
| | | Barium, Total | 77.7 | | MG/KG | 0.1 | 1.0 |
| | | Beryllium, Total | 1.8 | | MG/KG | 0.05 | 1.0 |
| | | Calcium, Total | 85.4 | | MG/KG | 3.9 | 1.0 |
| | | Cadmium, Total | 0.13 | | MG/KG | 0.05 | 1.0 |
| | | Cobalt, Total | 0.20 | | MG/KG | 0.20 | 1.0 |
| | | Chromium, Total | 94.7 | | MG/KG | 0.20 | 1.0 |
| | | Copper, Total | 1.2 | | MG/KG | 0.20 | 1.0 |
| | | Iron, Total | 1000 | | MG/KG | 4.4 | 1.0 |
| | | Mercury, Total | 0.05 | u | MG/KG | 0.05 | 5.0 |
| | | Potassium, Total | 48.3 | u | MG/KG | 48.3 | 1.0 |
| | | Magnesium, Total | 12.5 | | MG/KG | 2.4 | 1.0 |
| | | Manganese, Total | 6.3 | | MG/KG | 0.04 | 1.0 |
| | | Sodium, Total | 280 | | MG/KG | 2.0 | 1.0 |
| | | Nickel, Total | 0.35 | | MG/KG | 0.20 | 1.0 |
| | | Lead, Total | 0.39 | | MG/KG | 0.29 | 1.0 |
| | | Antimony, Total | 0.29 | u | MG/KG | 0.29 | 1.0 |
| | | Selenium, Total | 0.59 | u | MG/KG | 0.59 | 1.0 |
| | | Tin, Total | 2.7 | | MG/KG | 0.59 | 1.0 |
| | | Thallium, Total | 0.59 | u | MG/KG | 0.59 | 1.0 |
| | | Vanadium, Total | 0.14 | u | MG/KG | 0.14 | 1.0 |
| | | Zinc, Total | 12.1 | | MG/KG | 0.59 | 1.0 |
| | | Zirconium, Total | 8.2 | | MG/KG | 4.9 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/17/08

CLIENT: WC-HANFORD RC-088 K1322 LVL LOT #: 0809L076

WORK ORDER: 60049-001-001-0001-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -004 | J178L7 | Silver, Total | 0.09 u | MG/KG | 0.09 | 1.0 |
| | | Aluminum, Total | 3.4 u | MG/KG | 3.4 | 1.0 |
| | | Arsenic, Total | 0.43 u | MG/KG | 0.43 | 1.0 |
| | | Barium, Total | 0.17 | MG/KG | 0.09 | 1.0 |
| | | Beryllium, Total | 0.04 u | MG/KG | 0.04 | 1.0 |
| | | Calcium, Total | 22.6 | MG/KG | 3.4 | 1.0 |
| | | Cadmium, Total | 0.04 u | MG/KG | 0.04 | 1.0 |
| | | Cobalt, Total | 0.17 u | MG/KG | 0.17 | 1.0 |
| | | Chromium, Total | 0.17 u | MG/KG | 0.17 | 1.0 |
| | | Copper, Total | 0.17 u | MG/KG | 0.17 | 1.0 |
| | | Iron, Total | 9.6 | MG/KG | 3.9 | 1.0 |
| | | Mercury, Total | 0.008u | MG/KG | 0.008 | 1.0 |
| | | Potassium, Total | 42.5 u | MG/KG | 42.5 | 1.0 |
| | | Magnesium, Total | 6.1 | MG/KG | 2.2 | 1.0 |
| | | Manganese, Total | 0.34 | MG/KG | 0.03 | 1.0 |
| | | Sodium, Total | 148 | MG/KG | 1.7 | 1.0 |
| | | Nickel, Total | 0.17 u | MG/KG | 0.17 | 1.0 |
| | | Lead, Total | 0.26 u | MG/KG | 0.26 | 1.0 |
| | | Antimony, Total | 0.26 u | MG/KG | 0.26 | 1.0 |
| | | Selenium, Total | 0.52 u | MG/KG | 0.52 | 1.0 |
| | | Tin, Total | 1.0 | MG/KG | 0.52 | 1.0 |
| | | Thallium, Total | 0.52 u | MG/KG | 0.52 | 1.0 |
| | | Vanadium, Total | 0.12 u | MG/KG | 0.12 | 1.0 |
| | | Zinc, Total | 0.52 u | MG/KG | 0.52 | 1.0 |
| | | Zirconium, Total | 4.3 u | MG/KG | 4.3 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/17/08

CLIENT: WC-HANFORD RC-088 K1322 LVL LOT #: 0809L076

WORK ORDER: 60049-001-001-0001-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -005 | J178L8 | Silver, Total | 0.09 u | MG/KG | 0.09 | 1.0 |
| | | Aluminum, Total | 3.5 u | MG/KG | 3.5 | 1.0 |
| | | Arsenic, Total | 0.44 u | MG/KG | 0.44 | 1.0 |
| | | Barium, Total | 0.22 | MG/KG | 0.09 | 1.0 |
| | | Beryllium, Total | 0.04 u | MG/KG | 0.04 | 1.0 |
| | | Calcium, Total | 24.4 | MG/KG | 3.5 | 1.0 |
| | | Cadmium, Total | 0.04 u | MG/KG | 0.04 | 1.0 |
| | | Cobalt, Total | 0.18 u | MG/KG | 0.18 | 1.0 |
| | | Chromium, Total | 0.18 u | MG/KG | 0.18 | 1.0 |
| | | Copper, Total | 0.18 u | MG/KG | 0.18 | 1.0 |
| | | Iron, Total | 8.7 | MG/KG | 4.0 | 1.0 |
| | | Mercury, Total | 0.008u | MG/KG | 0.008 | 1.0 |
| | | Potassium, Total | 43.6 u | MG/KG | 43.6 | 1.0 |
| | | Magnesium, Total | 10.1 | MG/KG | 2.2 | 1.0 |
| | | Manganese, Total | 0.26 | MG/KG | 0.04 | 1.0 |
| | | Sodium, Total | 28.1 | MG/KG | 1.8 | 1.0 |
| | | Nickel, Total | 0.18 u | MG/KG | 0.18 | 1.0 |
| | | Lead, Total | 0.27 u | MG/KG | 0.27 | 1.0 |
| | | Antimony, Total | 0.27 u | MG/KG | 0.27 | 1.0 |
| | | Selenium, Total | 0.53 u | MG/KG | 0.53 | 1.0 |
| | | Tin, Total | 0.70 | MG/KG | 0.53 | 1.0 |
| | | Thallium, Total | 0.53 u | MG/KG | 0.53 | 1.0 |
| | | Vanadium, Total | 0.12 u | MG/KG | 0.12 | 1.0 |
| | | Zinc, Total | 0.53 u | MG/KG | 0.53 | 1.0 |
| | | Zirconium, Total | 4.4 u | MG/KG | 4.4 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/17/08

CLIENT: WC-HANFORD RC-088 K1322 LVL LOT #: 0809L076

WORK ORDER: 60049-001-001-0001-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| BLANK1 | 08L0335-MB1 | Silver, Total | 0.10 u | MG/KG | 0.10 | 1.0 |
| | | Aluminum, Total | 4.0 u | MG/KG | 4.0 | 1.0 |
| | | Arsenic, Total | 0.50 u | MG/KG | 0.50 | 1.0 |
| | | Barium, Total | 0.13 | MG/KG | 0.10 | 1.0 |
| | | Beryllium, Total | 0.05 u | MG/KG | 0.05 | 1.0 |
| | | Calcium, Total | 5.7 | MG/KG | 4.0 | 1.0 |
| | | Cadmium, Total | 0.05 u | MG/KG | 0.05 | 1.0 |
| | | Cobalt, Total | 0.20 u | MG/KG | 0.20 | 1.0 |
| | | Chromium, Total | 0.20 u | MG/KG | 0.20 | 1.0 |
| | | Copper, Total | 0.20 u | MG/KG | 0.20 | 1.0 |
| | | Iron, Total | 4.5 u | MG/KG | 4.5 | 1.0 |
| | | Potassium, Total | 49.3 u | MG/KG | 49.3 | 1.0 |
| | | Magnesium, Total | 2.5 u | MG/KG | 2.5 | 1.0 |
| | | Manganese, Total | 0.05 | MG/KG | 0.04 | 1.0 |
| | | Sodium, Total | 19.4 | MG/KG | 2.0 | 1.0 |
| | | Nickel, Total | 0.20 u | MG/KG | 0.20 | 1.0 |
| | | Lead, Total | 0.30 u | MG/KG | 0.30 | 1.0 |
| | | Antimony, Total | 0.30 u | MG/KG | 0.30 | 1.0 |
| | | Selenium, Total | 0.60 u | MG/KG | 0.60 | 1.0 |
| | | Tin, Total | 0.70 | MG/KG | 0.60 | 1.0 |
| | | Thallium, Total | 0.60 u | MG/KG | 0.60 | 1.0 |
| | | Vanadium, Total | 0.14 u | MG/KG | 0.14 | 1.0 |
| | | Zinc, Total | 0.60 u | MG/KG | 0.60 | 1.0 |
| | | Zirconium, Total | 5.0 u | MG/KG | 5.0 | 1.0 |
| BLANK1 | 08C0160-MB1 | Mercury, Total | 0.01 u | MG/KG | 0.01 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/17/08

CLIENT: WC-HANFORD RC-088 K1322 LVL LOT #: 0809L076

WORK ORDER: 60049-001-001-0001-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| -001 | J178L4 | Silver, Total | 4.6 | 0.1 u | 4.7 | 97.9 | 1.0 |
| | | Aluminum, Total | 202 | 17.4 | 189 | 97.8 | 1.0 |
| | | Arsenic, Total | 177 | 0.62 | 189 | 93.5 | 1.0 |
| | | Barium, Total | 782 | 552 | 189 | 122.2 | 1.0 |
| | | Beryllium, Total | 7.3 | 2.6 | 4.7 | 100 | 1.0 |
| | | Calcium, Total | 2630 | 396 | 2360 | 94.9 | 1.0 |
| | | Cadmium, Total | 5.1 | 0.61 | 4.7 | 95.5 | 1.0 |
| | | Cobalt, Total | 50.6 | 5.5 | 47.1 | 95.8 | 1.0 |
| | | Chromium, Total | 18.7 | 0.46 | 18.9 | 96.5 | 1.0 |
| | | Copper, Total | 25.9 | 2.4 | 23.6 | 99.6 | 1.0 |
| | | Iron, Total | 1410 | 1200 | 94.3 | 222.6* | 1.0 |
| | | Mercury, Total | 1.5 | 0.05u | 1.6 | 90.5 | 5.0 |
| | | Potassium, Total | 2140 | 48.8 u | 2360 | 90.8 | 1.0 |
| | | Magnesium, Total | 2220 | 60.2 | 2360 | 91.7 | 1.0 |
| | | Manganese, Total | 53.8 | 7.3 | 47.1 | 98.7 | 1.0 |
| | | Sodium, Total | 4120 | 1910 | 2360 | 93.6 | 1.0 |
| | | Nickel, Total | 44.5 | 0.39 | 47.1 | 93.7 | 1.0 |
| | | Lead, Total | 45.0 | 0.77 | 47.1 | 93.9 | 1.0 |
| | | Antimony, Total | 43.1 | 0.30u | 47.1 | 91.5 | 1.0 |
| | | Selenium, Total | 153 | 0.59u | 189 | 80.9 | 1.0 |
| | | Tin, Total | 86.6 | 0.60 | 94.3 | 91.2 | 1.0 |
| | | Thallium, Total | 178 | 0.59u | 189 | 94.3 | 1.0 |
| | | Vanadium, Total | 44.6 | 0.14u | 47.1 | 94.7 | 1.0 |
| | | Zinc, Total | 185 | 131 | 47.1 | 115.1 | 1.0 |
| | | Zirconium, Total | 405 | 5.0 u | 472 | 85.9 | 1.0 |

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/17/08

CLIENT: WC-HANFORD RC-088 K1322 LVL LOT #: 0809L076

WORK ORDER: 60049-001-001-0001-00

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|
| -001REP | J178L4 | Silver, Total | 0.1 u | 0.09u | NC | 1.0 |
| | | Aluminum, Total | 17.4 | 18.2 | 4.5 | 1.0 |
| | | Arsenic, Total | 0.62 | 0.65 | 4.8 | 1.0 |
| | | Barium, Total | 552 | 583 | 5.5 | 1.0 |
| | | Beryllium, Total | 2.6 | 2.8 | 7.4 | 1.0 |
| | | Calcium, Total | 396 | 402 | 1.6 | 1.0 |
| | | Cadmium, Total | 0.61 | 0.62 | 2.1 | 1.0 |
| | | Cobalt, Total | 5.5 | 5.7 | 3.6 | 1.0 |
| | | Chromium, Total | 0.46 | 0.43 | 7.9 | 1.0 |
| | | Copper, Total | 2.4 | 2.6 | 8.0 | 1.0 |
| | | Iron, Total | 1200 | 1270 | 5.4 | 1.0 |
| | | Mercury, Total | 0.05u | 0.05u | NC | 5.0 |
| | | Potassium, Total | 48.8 u | 46.1 u | NC | 1.0 |
| | | Magnesium, Total | 60.2 | 57.9 | 3.9 | 1.0 |
| | | Manganese, Total | 7.3 | 7.8 | 6.6 | 1.0 |
| | | Sodium, Total | 1910 | 1960 | 2.8 | 1.0 |
| | | Nickel, Total | 0.39 | 0.37 | 5.7 | 1.0 |
| | | Lead, Total | 0.77 | 0.90 | 16.2 | 1.0 |
| | | Antimony, Total | 0.30u | 0.28u | NC | 1.0 |
| | | Selenium, Total | 0.59u | 0.56u | NC | 1.0 |
| | | Tin, Total | 0.60 | 3.8 | 145.3 | 1.0 |
| | | Thallium, Total | 0.59u | 0.56u | NC | 1.0 |
| | | Vanadium, Total | 0.14u | 0.13u | NC | 1.0 |
| | | Zinc, Total | 131 | 138 | 5.4 | 1.0 |
| | | Zirconium, Total | 5.0 u | 4.7 u | NC | 1.0 |

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 09/17/08

CLIENT: WC-HANFORD RC-088 K1322 LVL LOT #: 0809L076

WORK ORDER: 60049-001-001-0001-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | SPIKED AMOUNT | UNITS | %RECOV |
|---|---|---|---|---|---|---|
| LCS1 | 08L0335-LC1 | Silver, LCS | 47.1 | 50.0 | MG/KG | 94.2 |
| | | Aluminum, LCS | 464 | 500 | MG/KG | 92.9 |
| | | Arsenic, LCS | 912 | 1000 | MG/KG | 91.2 |
| | | Barium, LCS | 464 | 500 | MG/KG | 92.9 |
| | | Beryllium, LCS | 23.4 | 25.0 | MG/KG | 93.6 |
| | | Calcium, LCS | 2340 | 2500 | MG/KG | 93.6 |
| | | Cadmium, LCS | 22.9 | 25.0 | MG/KG | 91.6 |
| | | Cobalt, LCS | 231 | 250 | MG/KG | 92.3 |
| | | Chromium, LCS | 47.1 | 50.0 | MG/KG | 94.2 |
| | | Copper, LCS | 118 | 125 | MG/KG | 94.1 |
| | | Iron, LCS | 463 | 500 | MG/KG | 92.5 |
| | | Potassium, LCS | 2230 | 2500 | MG/KG | 89.1 |
| | | Magnesium, LCS | 2280 | 2500 | MG/KG | 91.0 |
| | | Manganese, LCS | 70.4 | 75.0 | MG/KG | 93.9 |
| | | Sodium, LCS | 2280 | 2500 | MG/KG | 91.3 |
| | | Nickel, LCS | 186 | 200 | MG/KG | 93.0 |
| | | Lead, LCS | 232 | 250 | MG/KG | 93.0 |
| | | Antimony, LCS | 273 | 300 | MG/KG | 91.0 |
| | | Selenium, LCS | 892 | 1000 | MG/KG | 89.2 |
| | | Tin, LCS | 460 | 500 | MG/KG | 91.9 |
| | | Thallium, LCS | 925 | 1000 | MG/KG | 92.5 |
| | | Vanadium, LCS | 230 | 250 | MG/KG | 92.2 |
| | | Zinc, LCS | 93.6 | 100 | MG/KG | 93.6 |
| | | Zirconium, LCS | 460 | 500 | MG/KG | 91.9 |
| LCS1 | 08C0160-LC1 | Mercury, LCS | 4.7 | 4.7 | MG/KG | 100.9 |

Lionville Laboratory Incorporated

Logbook #: 98L

# SAMPLE DIGESTION RECORD

SOP: L-SPI-3020 Rev. 00

Digestion Batch #: 08L0335
Date/Time Initiated: 9/15/08 1330
Date/Time Completed: 9/15/08 2145
Analyst(s): MW
Matrix: Soil Water Other: oil
Instr. Type: AA (ICP)
Parameters: HSL+Sn, Zr

(Digested) / Undigested (circle one)
Balance #: B20
Balance Cal Verif: (Y) NA
Hot Plate Temp: 91°

Method: SW (circle)
3005A
3010A
3015
3020A
7060A (As/Se)
7760A (Ag)
(3050B)
3051
CLP ILMO3.0
ILMO4.0

DW 200.7 (1994)
200.9
3113B
MCAWW 200.7 (1982)
200 (AA)
206.2 (As/Se)
SM 3030C (NC)
Other teflon

TW

| COC Batch # 9L | Spike Vol(s) (mL) | Initial Wt/Vol (g/mL) | Final Vol (mL) | pH <2 | Type: To/So/TC | Texture | Color/Appearance | Artifact | Turb |
|---|---|---|---|---|---|---|---|---|---|
| 08084076-001 | | 1.01gm | 100ml | <2 | TO | liquid | brown oil | | RAM |
| W.E.(x2) 001R | | 1.07gm | | | | | | | |
| MW 9/15/08 001S | 1.0 ml* | 1.06gm | | | | | | | |
| 002 | | 1.08gm | | | | | | | |
| 003 | | 1.02gm | | | | | | | |
| 004 | | 1.16gm | | | | | clear liquid | | |
| 005 | | 1.13gm | | | | | | | |
| 08091085-001 | | 1.06gm | | | | | brown oil | | RAM |
| 001R | | 1.03gm | | | | | | | |
| 001S | 1.0 ml* | 1.03gm | | | | | | | |
| 002 | | 1.06gm | | | | | | | |
| 003 | | 1.09gm | | | | | | | |
| 004 | | 1.07gm | | | | | | | |
| 005 | | 1.09gm | | | | | | | |
| 006 | | 1.11gm | | | | | tan milky liquid | | |
| 007 | | 1.09gm | | | | | brown oil | | |
| 008 | | 1.11gm | | | | | light brown oil | | |
| 009 | | 1.13gm | | | | | clear liquid | | |
| 010 | | 1.09gm | | | | | tan milky liquid | | RAM |
| 011 | | 1.05gm | | | | | gray/brown milky liquid | | RAM |
| 012 | | 1.06gm | | | | | tan milky liquid | | |
| 013 | | 1.09gm | | | | | tan liquid | | |
| 014 | | 1.07gm | | | | | tan milky liquid | | RAM |
| 015 | | 1.06gm | | | | | | | |

Spiking IDs:
MS #: 8180-04-01
02
03
6072-78-07
LCS #: 08
09
10
11

Reagent IDs:
$HNO_3$ G07057
HCL G26054
$H_2O_2$ G15A18
1:1 $HNO_3$ 9789-053-06
1:1 HCL

File ID#: IC033502 IC033501

LIMS Transfer: (Y) N Updated

Data Review By/Date: 9/17/08

* also 0.5 ml 6072-079-13 (Zr)

# SAMPLE DIGESTION RECORD

SOP: L-SPI-3020 Rev. 00

Digestion Batch #: 08L0335
Date/Time Initiated:
Date/Time Completed:
Analyst(s): See page 059
Matrix: Soil Water Other:
Instr. Type: AA ICP
Parameters:

Digested / Undigested (circle one)
Balance #:
Balance Cal Verif: Y NA
Hot Plate Temp:

Method: SW (circle)

| | | | |
|---|---|---|---|
| | 3005A | DW | 200.7 (1994) |
| | 3010A | | 200.9 |
| | 3015 | | 3113B |
| | 3020A | | |
| | 7060A (As/Se) | MCAWW | 200.7 (1982) |
| | 7760A (Ag) | | 200 (AA) |
| | | | 206.2 (As/Se) |
| | 3050B | | |
| | 3051 | SM | 3030C (NC) |
| CLP | ILMO3.0 | Other | |
| | ILMO4.0 | | |

TW

| COC Batch # | Spike Vol(s) (mL) | Initial Wt/Vol (g/mL) | Final Vol (mL) | pH <2 | Type: To/So/ TC | Texture | Color/Appearance | Artifact | Turb |
|---|---|---|---|---|---|---|---|---|---|
| 08L0335-MB1 | | 1.0gm | 100ml | <2 | TO | coarse | boiling chips | | |
| LC1 | 1.0ml | 1.0gm | 1 | 1 | | 1 | 1 | | |

TW 9/15/08

Spiking IDs:
MS #: See page 059
LCS #: See page 059

Reagent IDs:
$HNO_3$
HCL
$H_2O_2$
1:1 $HNO_3$
1:1 HCL

See page 059

File ID#: IC033501
LIMS Transfer: (Y) N updated
Data Review By/Date: 9/12/08

Laboratory
Incorporated

# MERCURY PREPARATION

Logbook # 498

Analyst: EA
9/15/08
Start Time/Temp: 1815 / 94°
Finish Time/Temp: 1845 / 98°

Instrument ID: HG7.1
Balance #: B29 / NA
Pipette Calibration (Daily) Y ✓

Prep Batch: 08C0160
Worksheet: HG091601
SOP No. ME-HgCVAA, Rev. 02

pH < 2 for Liquids? __ Yes N/A No (If no: designate affected samples in Comments column, and initiate an SDR)

**NOTE: The Inital/Final Volume for water samples = 33mL, unless otherwise noted.**
**The Final volume for soil samples = 50mL, unless otherwise noted.**

| LvLI Batch # | Container Number | Spike Volume (mL) | Spike Conc. (µg/L) | Initial Wt. or Volume (g or mL) | Final Sample Volume (mL) | Comments, % Solids, etc. |
|---|---|---|---|---|---|---|
| Blank | H3 | | | 10mL | 50mL | |
| 0.2 µg/L | 8 | 0.100 | | | | |
| 1.0 | 3VG | 0.500 | | | | |
| 2.0 | 5H | 1.000 | | | | |
| 5.0 | 3C | 2.500 | | | | |
| 10.0 | 41 | 5.000 | | | | |
| ICV | RU | 0.125 | 2.5 | | | |
| CCV | 194 | 0.250 | 5.0 | | | |
| ICB/CCB | C4D | | | | | 90504 |
| MB1 | KX | | | 0.30 | | PBS160 100.0 |
| LCI | CM | * | * | 0.32 | | |
| 0809L053-001 | 205 | | | 0.35 | | R 99.03 |
| 001R | AP | | | 0.41 | | |
| 001S | P3 | 0.500 | 1.0 | 0.35 | | |
| 002 | DX | | | 0.31 | | 99.25 |
| 003 | 114 | | | 0.37 | | |
| 0809L074-001 | 5T | | | 0.31 | | 100.0 |
| 001R | Q12 | | | 0.31 | | |
| 001S | 154 | 0.050 | 10.0 | 0.31 | | |
| 002 | N2 | | | 0.33 | | |
| 003 | 31 | | | 0.32 | | |
| 004 | F8 | | | 0.36 | | |
| 005 | 514 | | | 0.39 | | |
| 0809L086-001 | 537 | | | 0.32 | | R 98.61 |
| 001R | NR | | | 0.36 | | |
| 001S | 81G | 0.500 | 1.0 | 0.32 | | |
| 0809L091-001 | TR | | | 0.30 | | 100.0 |

| Standard: | ID | Prep Date/Time |
|---|---|---|
| CAL/MS | R1 6072-78-14B | 9/15/08 1035 |
| CV/CCV/LCS | US 6072-78-15A | |

Reviewed By/Date: [signature] 9/16/

see book # 936Y for std traceability information

Soil LCS =US Metals in soil No.3; True Value = 4.70 mg/Kg *
Catalogue #1RM-021, Lot # E021

Water Matrix Spiking Solution Concentration = 0.1 µg/ml
Water LCS Spiking Concentration: 1.0 µg/ml

Lionville Laboratory Incorporated

# MERCURY PREPARATION

Logbook # 498

Analyst: ECD
Date 9/15/08
Start Time/Temp:
End Time/Temp: see page 020

Instrument ID HG3.1
Balance #: B29 / NA
Pipette Calibration (Daily) Y ___

Prep Batch: 08C0160
Worksheet: HG091601
SOP No. ME-HgCVAA, Rev. 02

pH < 2 for Liquids? __ Yes NA No (If no: designate affected samples in Comments column, and initiate an SDR)

**NOTE: The Inital/Final Volume for water samples = 33mL, unless otherwise noted.**
**The Final volume for soil samples = 50mL, unless otherwise noted.**

| LvLI Batch # | Container Number | Spike Volume (mL) | Spike Conc. (µg/L) | Initial Wt. or Volume (g or mL) | Final Sample Volume (mL) | Comments, % Solids, etc. |
|---|---|---|---|---|---|---|
| D809L091-002 | E | | | 0.32 | 50mL | 100. |
| 002R | 676 | | | 0.33 | | |
| 002S | 112 | 0.050 | 10.0 | 0.33 | | |
| 003 | HH | | | 0.30 | | R |
| 004 | P7 | | | 0.31 | | |
| 005 | L53 | | | 0.30 | | R |
| 006 | L2 | | | 0.30 | | |

ECD 9/15/08

| Standard: | ID | Prep Date/Time |
|---|---|---|
| CAL/MS | | |
| CV/CCV/LCS | see page 020 | |

Reviewed By/Date: [signature] 9/16

see book # 9368 for std traceability information

Soil LCS =US Metals in soil No.3; True Value = 4.70 mg/Kg
Catalogue #1RM-021, Lot # E021

Water Matrix Spiking Solution Concentration = 0.1 µg/ml
Water LCS Spiking Concentration: 1.0 µg/ml

nville Laboratory Use Only

809L076

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

LVLI

nt W.C. HANFORD SAP# RC-088

Final Proj. Sampling Date

ect# 60049-001-001-0001-00

ect Contact/Phone#

nville Laboratory Project Manager O. JOHNSON

SW846 Del STD TAT 7 days

e Rec'd 9-10-08 Date Due 9-17-08

| | | A | | B | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 6 | | 3 | | | | | | | | | | | |
| #/Type Container | Liquid | 1G | | 1G | | | | | | | | | | | |
| | Solid | | | | | | | | | | | | | | |
| Volume | | 60/40 | | 250 | | | | | | | | | | | |
| Preservatives | | — | | — | | | | | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | INORG | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | | | | JCP Metal Hg | CN | | | | | |
| | | Lionville Laboratory Use Only | | | | | | | | | | | | | |
| | | 0624H | 0625H | OPCB | | | | | MetD | | IIGN | | | | |

| RIX ES: Soil, Sediment, Solid, Sludge, Water, Oil, Air, Drum Solids, Drum Liquids, EP/TCLP Leachate, Wipe, Other, Fish | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 001 | J178L4 | | | oil | 8-8-08 | 0900 | | X | X | | | | | X | | X | | |
| | 002 | 5 | | | | | 0915 | | X | X | | | | | X | | X | | |
| | 003 | 6 | | | | | 0940 | | X | X | | | | | X | | X | | |
| | 004 | 7 | | | | | 0950 | X | X | X | | | | | X | | X | | |
| | 005 | 8 | | | | | 1020 | X | X | X | | | | | X | | X | | |
| | ~~006~~ | ~~J17H40~~ | | | ~~oil~~ | ~~8-8-08~~ | ~~0950~~ | | | | | | | | | | | | |
| | 007 | 41 | | | | | 1005 | | | | | | | | | | | | |
| | 008 | 42 | | | | | 1230 | | | | | | | | | | | | |
| | 009 | 43 | | | | | 1305 | | | | | | | | | | | | |
| | 010 | 44 | | | | | 1320 | | | | | | | | | | | | |

ecial Instructions: X=oil

MetD=HSL+Sn, Zn

Run matrix QC

**Special Instructions:**

1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fedway | [signature] | 9-9-08 | 1545 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |

| Relinquished | Received by | Date | Time |
|---|---|---|---|
| ORIGINAL REWRITTEN | | "COMPOSITE WASTE" | |

000000026

Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-088-062 | Page 1 of 1

| | | | |
|---|---|---|---|
| llector<br>B. Lawrence | Company Contact<br>Joan Kessner | Telephone No.<br>509-375-4688 | Project Coordinator<br>KESSNER, JH |
| Price Code | Data Turnaround<br>~~15 Days~~<br>7 Day by 9/10/08 | | |
| ject Designation<br>618-7 Burial Ground - Other | Sampling Location<br>618-7 Burial Ground (drums) | | SAF No.<br>RC-088 |
| Chest No.<br>Haz Mat Box | Field Logbook No.<br>EL-1395-13 | COA<br>RG61878500 | Method of Shipment<br>Expedited Ground |
| ipped To<br>EBERLINE SERVICES (LIONVILLE) | Offsite Property No.<br>see HSMR | | Bill of Lading/Air Bill No.<br>see HSMR |

000000027

**OSSIBLE SAMPLE HAZARDS/REMARKS**

*otential Radioactive contamination, potential beryllium ontamination*

**pecial Handling and/or Storage**

*one*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | | |
| Type of Container | aG | aG | aG | P | P | P | | | | |
| No. of Container(s) | 1 | 1 | 0 | 0 | 0 | 1 | | | | |
| Volume | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | | |
| SAMPLE ANALYSIS | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. RT 8/18/08 | | | | PIN# |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | |
| 78L4 NH 9/3/08 | OTHER | 8/18/08 | 0900 | | X | X | X | X | | 5901 |
| 78L5 | OTHER | | 0915 | | X | X | X | X | | 5475 |
| 78L6 | OTHER | | 0940 | | X | X | X | X | | 5954 |
| 78L7 | OTHER | | 0950 | X | X | X | X | X | | 5952 |
| 78L8 | OTHER | 8/18/08 | 1020 | X | X | X | X | X | | 5777 |

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Lawrence | 1300 8-19-08 | R. Fahlberg R Fahlberg | 1300 8-19-08 |
| R. Fahlberg R Fahlberg | 1500 8-19-08 | RT COFFMAN/RT Coffman | 1500 8/19/08 |
| COFFMAN/RT Coffman RT | 1215 9/3/08 | M Stankovich | 1215 9/3/08 |
| M Stankovich | 1215 9/3/08 | Ground | |
| ROADWAY | 1545 9-9-08 | | 1545 9-9-08 |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Arsenic, Lead, Selenium, Thallium, Tin, Zirconium}; Mercury - 7471 - (CV)

(2) Gross Alpha; Gross Beta; Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Uranium; Isotopic Thorium; Americium-241; Isotopic Plutonium; Strontium-89,90 -- Total Sr

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

CH-EE-011

**Washington Closure Hanford**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-088-062



000000028

| | | | |
|---|---|---|---|
| ollector<br>B. Lawrence | **Company Contact**<br>Joan Kessner | **Telephone No.**<br>509-375-4688 | **Project Coordinator**<br>KESSNER, JH |
| **Price Code** | **Data Turnaround**<br>~~15 Days~~ 7 days 9/10/08 | | |
| ·oject Designation<br>618-7 Burial Ground - Other | **Sampling Location**<br>618-7 Burial Ground (drums) | | **SAF No.**<br>RC-088 |
| e Chest No.<br>Haz Mat Box | **Field Logbook No.**<br>EL-1395-13 | **COA**<br>RG61878500 | **Method of Shipment**<br>Expedited Ground |
| ıipped To<br>EBERLINE SERVICES (LIONVILLE) | **Offsite Property No.**<br>see HSMR | | **Bill of Lading/Air Bill No.**<br>see HSMR |

**'OSSIBLE SAMPLE HAZARDS/REMARKS**

*'otential Radioactive contamination, potential beryllium ontamination*

**pecial Handling and/or Storage**

*'one*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Preservation** | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | | | |
| **Type of Container** | aG | aG | aG | P | P | P | | | | | |
| **No. of Container(s)** | 1 | 1 | 0 | 0 | 0 | 1 | | | | | |
| **Volume** | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | | | |
| **SAMPLE ANALYSIS** | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. RTC 8/18/08 | | | | | PIN# |
| Sample No. / Matrix * / Sample Date / Sample Time | | | | | | | | | | | |
| 78L4 / OTHER / 8/18/08 / 0900 | | X | X | X | X | | | | | | 5901 |
| 78L5 / OTHER / " / 0915 | | X | X | X | X | | | | | | 5475 |
| 78L6 / OTHER / " / 0940 | | X | X | X | X | | | | | | 5954 |
| 78L7 / OTHER / " / 0950 | X | X | X | X | X | | | | | | 5952 |
| 78L8 / OTHER / 8/18/08 / 1020 | X | X | X | X | X | | | | | | 5777 |

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Lawrence | 1300 8-19-08 | R. Fahlberg R Fahlberg | 1300 8-19-08 |
| R. Fahlberg R. Fahlberg | 1500 8-19-08 | RT COFFMAN / RT Coffman | 1500 8/19/08 |
| COFFMAN / RT Coffman | 1215 RTC 9/3/08 | M Stankovich | 1215 9/3/08 |
| Weft | 1215 | M Stankovich 9/3/08 | |
| M Stankovich 9/3/08 | | Ground | |
| BRADWAY | 1545 9-9-08 | | 1545 9-9-08 |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) (Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc); ICP Metals - 6010A (Add-on) (Arsenic, Lead, Selenium, Thallium, Tin, Zirconium); Mercury - 7471 - (CV)

(2) Gross Alpha; Gross Beta; Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Uranium; Isotopic Thorium; Americium-241; Isotopic Plutonium; Strontium-89,90 -- Total Sr

Matrix *
S=Soil
SB=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| BORATORY SECTION | Received By | Title | Date/Time |
| 'AL SAMPLE SPOSITION | Disposal Method | Disposed By | Date/Time |

H-EE-011

Lionville Laboratory Incorporated

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: W.C. Hanford

Project/SAP/SOW/Release #: RC-088

Date: 9/9/08

LvLI Batch #: 0809L076

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier: ROADWAY ~~FedEx~~ [illegible] 9-9-08 | | Airbill # 868043436-4 ~~7905 7304 2908~~ [illegible] 9-9-08 |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☐ Yes | ☐ No | ☑ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 8.3 8.4 | °C | Cooler # Box Box ~~ERC 97-056~~ [illegible] 9-9-08 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify): |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☐ Yes | ☑ No | |
| 6. Custody seals on sample containers intact, signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvLI) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No #001 Leaked into Bag | |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☐ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no, then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| 13. VOA, TOC, TOX free of headspace? | ☑ Yes | ☐ No | ☐ N/A |
| 14. QC stickers placed on bottles designated by client? | ☐ Yes | ☐ No | ☑ N/A |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☐ Yes | ☑ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☑ Yes | ☐ No | ☐ N/A |
| Person Contacted: D. JOHNSON | | Date: 9-9-08 | |

LvLI Lionville Laboratories

RECEIVED
OCT 2008

Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-088 K1322

DATE RECEIVED: 09/10/08 LVL LOT # :0809L076

| CLIENT ID | LVL # | | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|---|
| J178L7 | 004 | M1 | OI | 08LVG154 | 08/18/08 | N/A | 09/13/08 |
| J178L7 | 004 | M2 | OI | 08LVG155 | 08/18/08 | N/A | 09/15/08 |
| J178L8 | 005 | M1 | OI | 08LVG154 | 08/18/08 | N/A | 09/13/08 |
| J178L8 | 005 MS | M1 | OI | 08LVG154 | 08/18/08 | N/A | 09/13/08 |
| J178L8 | 005 MSD | M1 | OI | 08LVG154 | 08/18/08 | N/A | 09/13/08 |
| LAB QC: | | | | | | | |
| VBLKGJ | MB1 | | S | 08LVG154 | N/A | N/A | 09/13/08 |
| VBLKGJ | MB1 BS | | S | 08LVG154 | N/A | N/A | 09/13/08 |
| VBLKGK | MB1 | | S | 08LVG155 | N/A | N/A | 09/15/08 |
| VBLKGK | MB1 BS | | S | 08LVG155 | N/A | N/A | 09/15/08 |

LIONVILLE LABORATORY INC.

**Case Narrative**

**Client:** WC-HANFORD RC-088
**LVL #:** 0809L076
**SDG/SAF #** K1322/RC-088

**W.O. #:** 60049-001-001-0001-00
**Date Received:** 09-10-2008

**GC/MS VOLATILE**

Two (2) oil samples were collected on 08-18-2008.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8260B for TCL Volatile target compounds on 09-13,15-2008.

The following is a summary of QC results accompanying the sample results. Lionville Laboratory Inc (LvLI) certifies that all test results meet the requirements of NELAC except as noted below:

1. Samples were analyzed within required holding time.
2. Non-target compounds were not detected in these samples.
3. Samples J178L7 and J178L8 required a medium level analysis with an additional 8-fold and 4-fold dilution, respectively, due to the sample matrix.
4. All matrix spike recoveries were within acceptance criteria.
5. All blank spike recoveries were within acceptance criteria.
6. The method blank was below the reporting limit for all target compounds.
7. All internal standard area and retention time criteria were met.

r:\group\data\2008\voa\tnu\0809-076cs2.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages.

LvLI
LIONVILLE LABORATORY INC.

8. Manual integrations are performed according to SOP QA-125 to produce quality data with utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

9. LvLI is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

9/18/08
Date

# GLOSSARY

## ABBREVIATIONS

| | | |
|---|---|---|
| BS | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported. |
| BSD | = | Indicates blank spike duplicate. |
| MS | = | Indicates matrix spike. |
| MSD | = | Indicates matrix spike duplicate. |
| DL | = | Suffix added to sample number to indicate that results are from a diluted analysis. |
| NA | = | Not Applicable. |
| DF | = | Dilution Factor. |
| NR | = | Not Required. |
| SP, Z | = | Indicates Spiked Compound. |

# TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following 'flags' are used to indicate the technical reasons for quan modifications:

MP - **Missed Peak:** Manually added peak not found by automatic quan program.

PA - **Peak Assignment:** Quan report was changed to reflect correct peak assignment.

RI - **Routine Integration:** Routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the Dichlorobenzene isomers on the VOA packed column and Benzo (b) fluoranthene /Benzo (k) fluoranthene which are poorly resolve on the BNA column.

SP - **Split Peak:** The automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - **Co-elution/ Background:** Peak was manually integrated to eliminate contribution from co-eluting compounds, background signal, or other interference.

PI - **Proper Integration:** A peak with poor or inconsistent integration (i.e., excessive tail) was properly integrated manually.

Lionville Laboratory, Inc.
Volatiles by GC/MS, HSL List
Report Date: 09/16/08 11:42

RFW Batch Number: 0809L076 Client: WC-HANFORD RC-088 K1322 Work Order: 60049001001 Page: 1a

000000006

| | Cust ID: | J178L7 | | J178L7 | | J178L8 | | J178L8 | | J178L8 | | VBLKGJ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 004 | | 004 DL | | 005 | | 005 MS | | 005 MSD | | 08LVG154-MB1 | |
| | Matrix: | OIL | | OIL | | OIL | | OIL | | OIL | | SOIL | |
| | D.F.: | 4.00 | | 8.00 | | 2.86 | | 2.86 | | 2.86 | | 4.00 | |
| | Units: | ug/Kg | | ug/Kg | | ug/Kg | | ug/Kg | | ug/Kg | | ug/Kg | |
| | Level: | MED | | MED | | MED | | MED | | MED | | MED | |
| Surrogate Recovery | Toluene-d8 | 108 | % | 104 | % | 107 | % | 110 | % | 109 | % | 108 | % |
| | Bromofluorobenzene | 109 | % | 120 | % | 116 | % | 116 | % | 114 | % | 116 | % |
| | 1,2-Dichloroethane-d4 | 104 | % | 91 | % | 104 | % | 106 | % | 105 | % | 105 | % |
| | | | fl | | fl | | fl | | fl | | fl | | fl |
| Chloromethane | | 5000 | U | 10000 | U | 3600 | U | 88 | % | 84 | % | 5000 | U |
| Bromomethane | | 5000 | U | 10000 | U | 3600 | U | 100 | % | 98 | % | 5000 | U |
| Vinyl Chloride | | 5000 | U | 10000 | U | 3600 | U | 101 | % | 102 | % | 5000 | U |
| Chloroethane | | 5000 | U | 10000 | U | 3600 | U | 72 | % | 69 | % | 5000 | U |
| Methylene Chloride | | 2500 | U | 5000 | U | 1800 | U | 106 | % | 106 | % | 2500 | U |
| Acetone | | 5000 | U | 10000 | U | 3600 | U | 76 | % | 93 | % | 5000 | U |
| Carbon Disulfide | | 2500 | U | 5000 | U | 1800 | U | 110 | % | 113 | % | 2500 | U |
| 1,1-Dichloroethene | | 2500 | U | 5000 | U | 1800 | U | 119 | % | 118 | % | 2500 | U |
| 1,1-Dichloroethane | | 2500 | U | 5000 | U | 1800 | U | 98 | % | 98 | % | 2500 | U |
| 1,2-Dichloroethene (total) | | 1100 | J | 1300 | JD | 1800 | U | 103 | % | 102 | % | 2500 | U |
| Chloroform | | 2500 | U | 5000 | U | 1800 | U | 105 | % | 104 | % | 2500 | U |
| 1,2-Dichloroethane | | 2500 | U | 5000 | U | 1800 | U | 103 | % | 103 | % | 2500 | U |
| 2-Butanone | | 5000 | U | 10000 | U | 3600 | U | 75 | % | 79 | % | 5000 | U |
| 1,1,1-Trichloroethane | | 2500 | U | 5000 | U | 1800 | U | 110 | % | 109 | % | 2500 | U |
| Carbon Tetrachloride | | 2500 | U | 5000 | U | 1800 | U | 112 | % | 110 | % | 2500 | U |
| Bromodichloromethane | | 2500 | U | 5000 | U | 1800 | U | 106 | % | 100 | % | 2500 | U |
| 1,2-Dichloropropane | | 2500 | U | 5000 | U | 1800 | U | 95 | % | 92 | % | 2500 | U |
| cis-1,3-Dichloropropene | | 2500 | U | 5000 | U | 1800 | U | 102 | % | 102 | % | 2500 | U |
| Trichloroethene | | 64000 | E | 63000 | D | 1800 | U | 101 | % | 98 | % | 2500 | U |
| Dibromochloromethane | | 2500 | U | 5000 | U | 1800 | U | 111 | % | 108 | % | 2500 | U |
| 1,1,2-Trichloroethane | | 2500 | U | 5000 | U | 1800 | U | 100 | % | 104 | % | 2500 | U |
| Benzene | | 2500 | U | 5000 | U | 1800 | U | 97 | % | 96 | % | 2500 | U |
| Trans-1,3-Dichloropropene | | 2500 | U | 5000 | U | 1800 | U | 111 | % | 108 | % | 2500 | U |
| Bromoform | | 2500 | U | 5000 | U | 1800 | U | 94 | % | 93 | % | 2500 | U |
| 4-Methyl-2-pentanone | | 5000 | U | 10000 | U | 3600 | U | 79 | % | 84 | % | 5000 | U |
| 2-Hexanone | | 5000 | U | 10000 | U | 3600 | U | 75 | % | 79 | % | 5000 | U |
| Tetrachloroethene | | 2500 | U | 5000 | U | 1800 | U | 109 | % | 104 | % | 2500 | U |
| 1,1,2,2-Tetrachloroethane | | 2500 | U | 5000 | U | 1800 | U | 92 | % | 97 | % | 2500 | U |
| Toluene | | 2500 | U | 5000 | U | 1800 | U | 112 | % | 111 | % | 2500 | U |

*= Outside of EPA CLP QC limits.

RFW Batch Number: **0809L076** Client: **WC-HANFORD RC-088 K1322** Work Order: 60049001001 Page: 1b

| Cust ID: | J178L7 | | J178L7 | | J178L8 | | J178L8 | | J178L8 | | VBLKGJ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RFW#: | 004 | | 004 DL | | 005 | | 005 MS | | 005 MSD | | 08LVG154-MB1 | |
| Level: | MED | | MED | | MED | | MED | | MED | | MED | |
| Chlorobenzene | 2500 | U | 5000 | U | 1800 | U | 104 | % | 103 | % | 2500 | U |
| Ethylbenzene | 2500 | U | 5000 | U | 1800 | U | 115 | % | 113 | % | 2500 | U |
| Styrene | 2500 | U | 5000 | U | 1800 | U | 122 | % | 118 | % | 2500 | U |
| Xylenes (total) | 2500 | U | 5000 | U | 1800 | U | 115 | % | 113 | % | 2500 | U |
| cis-1,2-dichloroethene | 1100 | J | 1300 | JD | 1800 | U | 97 | % | 96 | % | 2500 | U |
| trans-1,2-dichloroethene | 2500 | U | 5000 | U | 1800 | U | 108 | % | 108 | % | 2500 | U |

*= Outside of EPA CLP QC limits.

000000007

Lionville Laboratory, Inc.
Volatiles by GC/MS, HSL List

Report Date: 09/16/08 11:42

RFW Batch Number: 0809L076 Client: WC-HANFORD RC-088 K1322 Work Order: 60049001001 Page: 2a

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Cust ID: | VBLKGJ BS | | VBLKGK | | VBLKGK BS | |
| Sample Information | RFW#: | 08LVG154-MB1 | | 08LVG155-MB1 | | 08LVG155-MB1 | |
| | Matrix: | SOIL | | SOIL | | SOIL | |
| | D.F.: | 4.00 | | 4.00 | | 4.00 | |
| | Units: | ug/Kg | | ug/Kg | | ug/Kg | |
| | Level: | MED | | MED | | MED | |
| Surrogate Recovery | Toluene-d8 | 114 | % | 108 | % | 110 | % |
| | Bromofluorobenzene | 118 | % | 116 | % | 114 | % |
| | 1,2-Dichloroethane-d4 | 107 | % | 93 | % | 91 | % |
| Chloromethane | | 94 | % | 5000 | U | 93 | % |
| Bromomethane | | 113 | % | 5000 | U | 78 | % |
| Vinyl Chloride | | 103 | % | 5000 | U | 105 | % |
| Chloroethane | | 92 | % | 5000 | U | 69 | % |
| Methylene Chloride | | 107 | % | 2500 | U | 100 | % |
| Acetone | | 87 | % | 5000 | U | 114 | % |
| Carbon Disulfide | | 115 | % | 2500 | U | 112 | % |
| 1,1-Dichloroethene | | 122 | % | 2500 | U | 120 | % |
| 1,1-Dichloroethane | | 103 | % | 2500 | U | 92 | % |
| 1,2-Dichloroethene (total) | | 104 | % | 2500 | U | 100 | % |
| Chloroform | | 108 | % | 2500 | U | 96 | % |
| 1,2-Dichloroethane | | 104 | % | 2500 | U | 87 | % |
| 2-Butanone | | 78 | % | 5000 | U | 73 | % |
| 1,1,1-Trichloroethane | | 111 | % | 2500 | U | 96 | % |
| Carbon Tetrachloride | | 114 | % | 2500 | U | 102 | % |
| Bromodichloromethane | | 105 | % | 2500 | U | 95 | % |
| 1,2-Dichloropropane | | 99 | % | 2500 | U | 94 | % |
| cis-1,3-Dichloropropene | | 106 | % | 2500 | U | 108 | % |
| Trichloroethene | | 101 | % | 2500 | U | 104 | % |
| Dibromochloromethane | | 119 | % | 2500 | U | 109 | % |
| 1,1,2-Trichloroethane | | 105 | % | 2500 | U | 99 | % |
| Benzene | | 100 | % | 2500 | U | 96 | % |
| Trans-1,3-Dichloropropene | | 115 | % | 2500 | U | 107 | % |
| Bromoform | | 102 | % | 2500 | U | 100 | % |
| 4-Methyl-2-pentanone | | 94 | % | 5000 | U | 84 | % |
| 2-Hexanone | | 90 | % | 5000 | U | 87 | % |
| Tetrachloroethene | | 106 | % | 2500 | U | 105 | % |
| 1,1,2,2-Tetrachloroethane | | 103 | % | 2500 | U | 94 | % |
| Toluene | | 115 | % | 2500 | U | 107 | % |

*= Outside of EPA CLP QC limits.

000000000

RFW Batch Number: 0809L076 Client: WC-HANFORD RC-088 K1322 Work Order: 60049001001 Page: 2b

| Cust ID: | VBLKGJ BS | | VBLKGK | | VBLKGK BS | |
|---|---|---|---|---|---|---|
| RFW#: | 08LVG154-MB1 | | 08LVG155-MB1 | | 08LVG155-MB1 | |
| Level: | MED | | MED | | MED | |
| Chlorobenzene | 107 | % | 2500 | U | 99 | % |
| Ethylbenzene | 118 | % | 2500 | U | 111 | % |
| Styrene | 126 | % | 2500 | U | 116 | % |
| Xylenes (total) | 118 | % | 2500 | U | 107 | % |
| cis-1,2-dichloroethene | 99 | % | 2500 | U | 97 | % |
| trans-1,2-dichloroethene | 109 | % | 2500 | U | 103 | % |

*= Outside of EPA CLP QC limits.

000000009

Lionville Laboratory Use Only

J809L076

# Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI Lionville Laboratory Inc.

Client: W. C. HANFORD SAF# RC-088

Est. Final Proj. Sampling Date:

Project#: 60049-001-001-0001-00

Project Contact/Phone#:

Lionville Laboratory Project Manager: O. JOHNSON

QC: SW846 Del: STD TAT: 7 days

Date Rec'd: 9-10-08 Date Due: 9-17-08

| | A | B |
|---|---|---|
| Refrigerator # | 6 | 3 |
| #/Type Container (Liquid / Solid) | 1G | 1G |
| Volume | 60/40 | 250 |
| Preservatives | — | — |

ANALYSES REQUESTED → ORGANIC: VOA, BNA, ~~Pest~~/PCB, Herb; INORG: ICP Metal, ~~Hg~~, CN, Ignitability

Lionville Laboratory Use Only: 0624H, 0625H, OPCB, Met①, IIGN

MATRIX CODES: Soil, Sediment, Solid, Sludge, Water, Oil, Air, Drum Solids, Drum Liquids, EP/TCLP Leachate, Wipe, Other, Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | 0624H | 0625H | OPCB | | | | Met① | | IIGN | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | J178L4 | | | OIL | 8-18-08 | 0900 | | X | X | | | | X | | X | | | | |
| 002 | 5 | | | | | 0915 | | X | X | | | | X | | X | | | | |
| 003 | 6 | | | | | 0940 | | X | X | | | | X | | X | | | | |
| 004 | 7 | | | | | 0950 | X | X | X | | | | X | | X | | | | |
| 005 | 8 | | | | | 1020 | X | X | X | | | | X | | X | | | | |
| ~~006~~ | ~~J178H0~~ | | | ~~OIL~~ | ~~9-2-08~~ | ~~0950~~ | | | | | | | | | | | | | |
| 007 | 41 | | | | | 1005 | | | | | | | | | | | | | |
| 008 | 42 | | | | | 1200 | | | | | | | | | | | | | |
| 009 | 43 | | | | | 1305 | | | | | | | | | | | | | |
| 010 | 44 | | | | | 1320 | | | | | | | | | | | | | |

Special Instructions: X=oil

Met①=HSL+Sn, Zn

Run matrix QC

Special Instructions:
1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Rod Way | [signature] | 9-9-08 | 1545 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |

| Relinquished | Received by | Date | Time |
|---|---|---|---|
| | | | |

ORIGINAL REWRITTEN

"COMPOSITE WASTE"

0000000010

**Washington Closure Hanford**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-088-062 | Page 1 of 1

| | | | |
|---|---|---|---|
| Collector: B. Lawrence | Company Contact: Joan Kessner | Telephone No.: 509-375-4688 | Project Coordinator: KESSNER, JH |
| Price Code | Data Turnaround: ~~15 Days~~ 7 Day by 9/10/08 | | |
| Project Designation: 618-7 Burial Ground - Other | Sampling Location: 618-7 Burial Ground (drums) | | SAF No.: RC-088 |
| Ice Chest No.: Haz Mat Box | Field Logbook No.: EL-1395-13 | COA: RG61878500 | Method of Shipment: Expedited Ground |
| Shipped To: EBERLINE SERVICES (LIONVILLE) | Offsite Property No.: see HSMR | | Bill of Lading/Air Bill No.: see HSMR |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radioactive contamination, potential beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | | | |
| Type of Container | aG | aG | aG | P | P | P | | | | | |
| No. of Container(s) | 1 | 1 | 0 | 0 | 0 | 1 | | | | | |
| Volume | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | | | |
| SAMPLE ANALYSIS | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. RTC 8/18/08 | | | | | PIN # |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| ~~J178L4~~ NA 9/3/08 | OTHER | 8/18/08 | 0900 | | X | X | X | X | | | 5901 |
| J178L5 | OTHER | | 0915 | | X | X | X | X | | | 5475 |
| J178L6 | OTHER | | 0940 | | X | X | X | X | | | 5954 |
| J178L7 | OTHER | | 0950 | X | X | X | X | X | | | 5952 |
| J178L8 | OTHER | 8/18/08 | 1020 | X | X | X | X | X | | | 5777 |

**CHAIN OF POSSESSION** — Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| B Lawrence | 1300 8-19-08 | R. Fahlberg R. Fahlberg | 1300 8-19-08 |
| R. Fahlberg R. Fahlberg | 1500 8-19-08 | RT COFFMAN / RT Coffman | 1500 8/19/08 |
| RT COFFMAN / RT Coffman | 1215 RTC 9/3/08 | M Stankovich | 1215 9/3/08 |
| M Stankovich | 1215 9/3/08 | Ground | |
| Ground | | | |
| Relinquished By/Removed From: ROADWAY | Date/Time: 9-9-08 1545 | Received By/Stored In | Date/Time: 9-9-08 1545 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) (Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc); ICP Metals - 6010A (Add-on) (Arsenic, Lead, Selenium, Thallium, Tin, Zirconium); Mercury - 7471 - (CV)

(2) Gross Alpha; Gross Beta; Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Uranium; Isotopic Thorium; Americium-241; Isotopic Plutonium; Strontium-89,90 -- Total Sr

**Matrix ***

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

NCH-EE-011

000000011

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-088-062



| | | | |
|---|---|---|---|
| Collector: B. Lawrence | Company Contact: Joan Kessner | Telephone No.: 509-375-4688 | Project Coordinator: KESSNER, JH |
| Price Code | Data Turnaround: ~~15 Days~~ 7 days eg. 9/10/08 | | |
| Project Designation: 618-7 Burial Ground - Other | Sampling Location: 618-7 Burial Ground (drums) | | SAF No.: RC-088 |
| Ice Chest No.: Haz Mat Box | Field Logbook No.: EL-1395-13 | COA: RG61878500 | Method of Shipment: Expedited Ground |
| Shipped To: EBERLINE SERVICES (LIONVILLE) | Offsite Property No.: see HSMR | | Bill of Lading/Air Bill No.: see HSMR |

000000012

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radioactive contamination, potential beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | | | |
| Type of Container | aG | aG | aG | P | P | P | | | | | |
| No. of Container(s) | 1 | 1 | 0 | 0 | 0 | 1 | | | | | |
| Volume | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | | | |
| SAMPLE ANALYSIS | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. RTC 8/18/08 | | | | | PIN # |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| J178L4 | OTHER | 8/18/08 | 0900 | | X | X | X | X | | | 5901 |
| J178L5 | OTHER | | 0915 | | X | X | X | X | | | 5475 |
| J178L6 | OTHER | | 0940 | | X | X | X | X | | | 5954 |
| J178L7 | OTHER | | 0950 | X | X | X | X | X | | | 5952 |
| J178L8 | OTHER | 8/18/08 | 1020 | X | X | X | X | X | | | 5777 |

J178L7 9/3/08

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| Relinquished By/Removed From | Date/Time 1300 | Received By/Stored In | Date/Time 1300 |
| B. Lawrence 8-19-08 | | R. Fahlberg R. Fahlberg 8-19-08 | |
| Relinquished By/Removed From | Date/Time 1300 | Received By/Stored In | Date/Time 1300 |
| R. Fahlberg R. Fahlberg 8-19-08 | | RT COFFMAN / RT Coffman 8/19/08 | |
| Relinquished By/Removed From | Date/Time 1215 | Received By/Stored In | Date/Time 1215 |
| RT COFFMAN / RT Coffman 9/3/08 | | M. Stankovich 9/3/08 | |
| Relinquished By/Removed From | Date/Time 1215 | Received By/Stored In | Date/Time |
| M. Stankovich 9/3/08 | | Ground | |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| ROADWAY 9-9-08 | 9-9-08 1545 | | 9-9-08 1545 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Arsenic, Lead, Selenium, Thallium, Tin, Zirconium}; Mercury - 7471 - (CV)

(2) Gross Alpha; Gross Beta; Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Uranium; Isotopic Thorium; Americium-241; Isotopic Plutonium; Strontium-89,90 -- Total Sr

Matrix *

S=Soil
SB=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

Lionville Laboratory Incorporated

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: W.C. Hanford

Date: 9/9/08

Project/SAP/SOW/Release #: RC-088

LvLI Batch #: 0809L076

Sample Custodian: [signature]

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier ROADWAY ~~FedEx~~ | | Airbill # 868043436-4 ~~7905 7304 2908~~ |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☐ Yes | ☐ No | ☑ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 8.3 ~~8.4~~ | °C | Cooler # Box ~~Box FRE A-056~~ |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify): |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☐ Yes | ☑ No | |
| 6. Custody seals on sample containers intact, signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvLI) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No | #001 Leak Inside Bag |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☐ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no, then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| 13. VOA, TOC, TOX free of headspace? | ☑ Yes | ☐ No | ☐ N/A |
| 14. QC stickers placed on bottles designated by client? | ☐ Yes | ☐ No | ☑ N/A |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☐ Yes | ☑ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☑ Yes | ☐ No | ☐ N/A |
| Person Contacted D. JOHNSON | | Date 9-9-08 | |

LVLI

RECEIVED
OCT 2008

Lionville Laboratory, Inc.
PCB ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-088 K1322

DATE RECEIVED: 09/10/08 LVL LOT # :0809L076

| CLIENT ID | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| J178L4 | 001 | OI | 08LE0438 | 08/18/08 | 09/15/08 | 09/18/08 |
| J178L4 | 001 MS | OI | 08LE0438 | 08/18/08 | 09/15/08 | 09/18/08 |
| J178L4 | 001 MSD | OI | 08LE0438 | 08/18/08 | 09/15/08 | 09/18/08 |
| J178L5 | 002 | OI | 08LE0438 | 08/18/08 | 09/15/08 | 09/18/08 |
| J178L6 | 003 | OI | 08LE0438 | 08/18/08 | 09/15/08 | 09/18/08 |
| J178L7 | 004 | OI | 08LE0438 | 08/18/08 | 09/15/08 | 09/18/08 |
| J178L8 | 005 | OI | 08LE0438 | 08/18/08 | 09/15/08 | 09/18/08 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| PBLKUP | MB1 | S | 08LE0438 | N/A | 09/15/08 | 09/17/08 |
| PBLKUP | MB1 BS | S | 08LE0438 | N/A | 09/15/08 | 09/17/08 |

LIONVILLE LABORATORY INC.

**Case Narrative**

**Client:** WC-HANFORD RC-088 K1322
**LVL #:** 0809L076

**W.O. #:** 60049-001-001-0001-00
**Date Received:** 09-10-2008

**PCB**

Five (5) oil samples were collected on 08-18-2008.

The samples and their associated QC samples were extracted on 09-15-2008 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedure on 09-17,18-2008. The extraction procedure was based on method 3580A (waste dilution 1g into 10 mLs of Hexane) and the extracts were analyzed based on method 8082.

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LVL) certifies that all test results meet the requirements of NELAC except as noted below:

1. Discrepancies from the LVL sample acceptance policy have been recorded on the sample receipt checklist.

2. All samples were received past the recommended hold time. The samples were extracted within 5 days of receipt and subsequently analyzed with hold time.

3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.

4. The method blank was below the reporting limits for all target compounds.

5. All obtainable surrogate recoveries were within acceptance criteria.

6. All blank spike recoveries were within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

8. All initial calibrations associated with this data set were within acceptance criteria.

9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

r:\group\data\2008\pest-pcb\tmu\0809-076ojoil2.pcb.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 11 pages.

LVLI
LIONVILLE LABORATORY INC.

10. LVL is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory

9/30/08
Date

# GLOSSARY OF DATA

## DATA QUALIFIERS

| | | |
|---|---|---|
| U | = | Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U). |
| J | = | Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J. |
| B | = | This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. |
| E | = | Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution. |
| I | = | Interference. |
| . I | = | Indicates an interference on one analytical column only. Result is reported from remaining analytical column. |

## ABBREVIATIONS

| | | |
|---|---|---|
| BS | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported. |
| BSD | = | Indicates blank spike duplicate. |
| MS | = | Indicates matrix spike. |
| MSD | = | Indicates matrix spike duplicate. |
| DL | = | Indicates that recoveries were not obtained because the extract had to be diluted for analysis. |
| NA | = | Not Applicable. |
| DF | = | Dilution Factor. |
| NR | = | Not Required. |
| NS | = | Not Spiked. |
| SP | = | Indicates Spiked Compound. |
| P | = | This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P". |
| D | = | This flag identifies all compounds identified in an analysis at a secondary dilution factor. |
| C | = | This flag applies to a compound that has been confirmed by GC/MS. |
| NPM | = | No pattern match for multi-component target analytes. |

**Lionville Laboratory, Inc.**

PCBs by GC

Report Date: 09/19/08 13:33

RFW Batch Number: **0809L076** Client: **WC-HANFORD RC-088 K1322** Work Order: 60049001001 Page: 1

| | Cust ID: | J178L4 | J178L4 | J178L4 | J178L5 | J178L6 | J178L7 |
|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | 001 MS | 001 MSD | 002 | 003 | 004 |
| | Matrix: | OIL | OIL | OIL | OIL | OIL | OIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |
| Surrogate: | Tetrachloro-m-xylene | 104 % | 95 % | 100 % | 80 % | 83 % | 119 % |
| | Decachlorobiphenyl | 116 % | 98 % | 97 % | 88 % | 94 % | 109 % |
| | | fl | fl | fl | fl | fl | fl |
| Aroclor-1016 | | 400 U | 99 % | 104 % | 400 U | 400 U | 400 U |
| Aroclor-1221 | | 400 U | 400 U | 400 U | 400 U | 400 U | 400 U |
| Aroclor-1232 | | 400 U | 400 U | 400 U | 400 U | 400 U | 400 U |
| Aroclor-1242 | | 400 U | 400 U | 400 U | 400 U | 400 U | 400 U |
| Aroclor-1248 | | 400 U | 400 U | 400 U | 400 U | 400 U | 400 U |
| Aroclor-1254 | | 400 U | 400 U | 400 U | 400 U | 400 U | 400 U |
| Aroclor-1260 | | 400 U | 92 % | 93 % | 400 U | 400 U | 400 U |

| | Cust ID: | J178L8 | PBLKUP | PBLKUP BS |
|---|---|---|---|---|
| Sample Information | RFW#: | 005 | 08LE0438-MB1 | 08LE0438-MB1 |
| | Matrix: | OIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG |
| Surrogate: | Tetrachloro-m-xylene | 120 % | 89 % | 107 % |
| | Decachlorobiphenyl | 120 % | 81 % | 101 % |
| | | fl | fl | fl |
| Aroclor-1016 | | 400 U | 400 U | 91 % |
| Aroclor-1221 | | 400 U | 400 U | 400 U |
| Aroclor-1232 | | 400 U | 400 U | 400 U |
| Aroclor-1242 | | 400 U | 400 U | 400 U |
| Aroclor-1248 | | 400 U | 400 U | 400 U |
| Aroclor-1254 | | 400 U | 400 U | 400 U |
| Aroclor-1260 | | 400 U | 400 U | 104 % |

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory, Inc.

# SAMPLE EXTRACTION RECORD

Sheet no.: 1

Extract. Date: 09/15/08 Extraction Batch No: 08LE0438 Analyst: MF Method: **** WD358

Test: OPCB Cleanup Date: 09/15/08 Analyst: MF Client: WC-HANFORD RC-088 K1326

LIMS Report Date: 09/16/08 Solvent: HEXANE Adsorbent: H2SO4

000000006

| Sample No: | Client Name / Client ID | pH | Initial WT/VOL | Surr. Mult. | Spike Mult. | Final VOL | Final VOL | Split Mult. | GPC Y/N | % Solids | C/D FACTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0809L054- | WC-HANFORD RC-088 K1326 | | | | | | | | | | |
| 001 | J17H35 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 001 -S | J17H35 | | 1.0 | 1.0 | 1.0 | 10 | | 1.0 | N | 0.0 | 10000 |
| 001 -T | J17H35 | | 1.0 | 1.0 | 1.0 | 10 | | 1.0 | N | 0.0 | 10000 |
| 002 | J17H36 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 004 | J17H38 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 005 | J17H39 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 0809L076- | WC-HANFORD RC-088 K1322 | | | | | | | | | | |
| 001 | J178L4 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 001 -S | J178L4 | | 1.0 | 1.0 | 1.0 | 10 | | 1.0 | N | 0.0 | 10000 |
| 001 -T | J178L4 | | 1.0 | 1.0 | 1.0 | 10 | | 1.0 | N | 0.0 | 10000 |
| 002 | J178L5 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 003 | J178L6 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 004 | J178L7 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 005 | J178L8 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 0809L091- | WC-HANFORD RC-088 | | | | | | | | | | |
| 001 | J17H45 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 001 -S | J17H45 | | 1.0 | 1.0 | 1.0 | 10 | | 1.0 | N | 0.0 | 10000 |
| 001 -T | J17H45 | | 1.0 | 1.0 | 1.0 | 10 | | 1.0 | N | 0.0 | 10000 |
| 002 | J17H46 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 003 | J17H47 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 004 | J17H48 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 005 | J17H49 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |
| 006 | J17HM8 | | 1.0 | 1.0 | | 10 | | 1.0 | N | 0.0 | 10000 |

Comments:
Surrogate: 250 UL OLM PSURR 89916407
Spike: 250 UL AR1660 89916603

| Extracts Transferred | Relinquished By | Date Time | Received By | Date Time | Reason for Transfer |
|---|---|---|---|---|---|
| all | [signature] | 9/16/08 0905 | [signature] | 9/16/08 9:05 | GC |

Lionville Laboratory, Inc.

SAMPLE EXTRACTION RECORD

Sheet no.: 2 WD3580

Extract. Date: 09/15/08 Extraction Batch No: 08LE0438 Analyst: MF Method: ****

Test: OPCB Cleanup Date: 09/15/08 Analyst: MF Client: WC-HANFORD RC-088 K1326

LIMS Report Date: 09/16/08 Solvent: HEXANE Adsorbent: H2SO4

| Sample No: | Client Name / Client ID | pH | Initial WT/VOL | Surr. Mult. | Spike Mult. | Final VOL | Final VOL | Split Mult. | GPC Y/N | % Solids | C/D FACTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 08LE0438-MB1 | PBLKUP | | 1.0 | 1.0 | | 10 | | 1.0 | N | 100.00 | 10000 |
| 08LE0438-MB1 -S | PBLKUP | | 1.0 | 1.0 | 1.0 | 10 | | 1.0 | N | 100.00 | 10000 |

Comments:
Surrogate: 250 UL OLM PSURR 89916407
Spike: 250 UL AR1660 89916603

| Extracts Transferred | Relinquished By | Date Time | Received By | Date Time | Reason for Transfer |
|---|---|---|---|---|---|
| all | [illegible] | 9/16/08 0905 | SL | 9/16/08 9:05 | GC |

000000007

nville Laboratory Use Only

1809L076

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

LVLI

nt W. C. HANFORD SAP# RC-088

Final Proj. Sampling Date

lect# 60049-001-001-0001-00

lect Contact/Phone#

nville Laboratory Project Manager O. JOHNSON

SW846 Del STD TAT 7 days

e Rec'd 9-10-08 Date Due 9-17-08

| | | A | | B | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 6 | | 3 | | | | | | | | | | | | |
| #/Type Container | Liquid | 1G | | 1G | | | | | | | | | | | | |
| #/Type Container | Solid | | | | | | | | | | | | | | | |
| Volume | | 60ml | | 250 | | | | | | | | | | | | |
| Preservatives | | — | | — | | | | | | | | | | | | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | | | INORG | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | | | | | ICP Metal | CN | | | | | |

| MATRIX (ES) | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | 8260 | 8270 | OPCB | | | | | Met① | | ITGN | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Soil, Sediment, Solid, Sludge, Water, Oil, Air, Drum Solids, Drum Liquids, EP/TCLP, Leachate, Wipe, Other, Fish | 001 | J178L4 | | | oil | 8-18-08 | 0900 | | X | X | | | | | X | | X | | | | |
| | 002 | 5 | | | | | 0915 | | X | X | | | | | X | | X | | | | |
| | 003 | 6 | | | | | 0940 | | X | X | | | | | X | | X | | | | |
| | 004 | 7 | | | | | 0950 | X | X | X | | | | | X | | X | | | | |
| | 005 | 8 | | | | | 1020 | X | X | X | | | | | X | | X | | | | |
| | ~~006~~ | ~~J17H40~~ | | | ~~oil~~ | ~~8-18-08~~ | ~~0950~~ | | | | | | | | | | | | | | |
| | 007 | 41 | | | | | 1005 | | | | | | | | | | | | | | |
| | 008 | 42 | | | | | 1200 | | | | | | | | | | | | | | |
| | 009 | 43 | | | | | 1305 | | | | | | | | | | | | | | |
| | 010 | 44 | | | | | 1320 | | | | | | | | | | | | | | |

Lionville Laboratory Use Only

ecial Instructions: X=oil

Met①=HSL+Sn, Zn

Special Instructions:

1.
2.
3.
4.
5.
6.

Run matrix QC

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | [illegible] | 9-9-08 | 1545 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |

| Relinquished | Received by | Date | Time |
|---|---|---|---|
| | | | |

ORIGINAL REWRITTEN

COMPOSITE MADE

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-088-062 | Page 1 of 1

| | | | |
|---|---|---|---|
| ollector<br>B. Lawrence | Company Contact<br>Joan Kessner | Telephone No.<br>509-375-4688 | Project Coordinator<br>KESSNER, JH |
| Price Code | Data Turnaround<br>~~15 Days~~<br>7 Day by 9/10/08 | | |
| oject Designation<br>618-7 Burial Ground - Other | Sampling Location<br>618-7 Burial Ground (drums) | | SAF No.<br>RC-088 |
| e Chest No. Haz Mat Box | Field Logbook No.<br>EL-1395-13 | COA<br>RG61878500 | Method of Shipment<br>Expedited Ground |
| ipped To<br>EBERLINE SERVICES (LIONVILLE) | Offsite Property No.<br>see HSMK | | Bill of Lading/Air Bill No.<br>see HSMK |

**OSSIBLE SAMPLE HAZARDS/REMARKS**

*otential Radioactive contamination, potential beryllium ontamination*

**pecial Handling and/or Storage**

*one*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | | |
| Type of Container | aG | aG | aG | P | P | P | | | | |
| No. of Container(s) | 1 | 1 | 0 | 0 | 0 | 1 | | | | |
| Volume | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | | |
| SAMPLE ANALYSIS | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. RTC 8/18/08 | | | | PIN# |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | PIN# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~78L4~~ NH 9/3/08 | OTHER | 8/18/08 | 0900 | | X | X | X | X | | | | 5901 |
| 78L5 | OTHER | | 0915 | | X | X | X | X | | | | 5475 |
| 78L6 | OTHER | | 0940 | | X | X | X | X | | | | 5954 |
| 78L7 | OTHER | | 0950 | X | X | X | X | X | | | | 5952 |
| 78L8 | OTHER | 8/18/08 | 1020 | X | X | X | X | X | | | | 5777 |

| CHAIN OF POSSESSION | Sign/Print Names | | |
|---|---|---|---|
| inquished By/Removed From<br>Lawrence | Date/Time 1300<br>8-19-08 | Received By/Stored In<br>R. Fahlberg R. Fahlberg 8-19-08 | Date/Time 1300 |
| inquished By/Removed From<br>R. Fahlberg R. Fahlberg 8-19-08 | Date/Time 1500 | Received By/Stored In<br>RTCOFFMAN/RTCoffman 8/19/08 | Date/Time 1500 |
| inquished By/Removed From<br>RTCOFFMAN/RTCoffman RTC 8/9/3/08 | Date/Time 1215 | Received By/Stored In<br>mStankovich 9/3/08 | Date/Time 1215 |
| inquished By/Removed From<br>mStankovich 9/3/08 | Date/Time 1215 | Received By/Stored In<br>Ground | Date/Time |
| inquished By/Removed From<br>ROADWAY 9-9-08 1545 | Date/Time | Received By/Stored In<br>9-9-08 1545 | Date/Time |
| inquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Arsenic, Lead, Selenium, Thallium, Tin, Zirconium}; Mercury - 7471 - (CV)

(2) Gross Alpha; Gross Beta; Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Uranium; Isotopic Thorium; Americium-241; Isotopic Plutonium; Strontium-89,90 -- Total Sr

**Matrix ***

S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| ABORATORY SECTION | Received By | Title | Date/Time |
| NAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

CH-EE-011

000000000

Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-088-062 | Page 1 of 1

| | | | |
|---|---|---|---|
| lector<br>. Lawrence | Company Contact<br>Joan Kessner | Telephone No.<br>509-375-4688 | Project Coordinator<br>KESSNER, JH |
| Price Code | Data Turnaround<br>~~15 Days~~ 7 days 9/10/08 | | |
| lect Designation<br>618-7 Burial Ground - Other | Sampling Location<br>618-7 Burial Ground (drums) | | SAF No.<br>RC-088 |
| Chest No. Haz Mat Box | Field Logbook No.<br>EL-1395-13 | COA<br>RG61878500 | Method of Shipment Expedited Ground |
| ipped To<br>EBERLINE SERVICES (LIONVILLE) | Offsite Property No. see HSMR | | Bill of Lading/Air Bill No. see HSMR |

000000010

**OSSIBLE SAMPLE HAZARDS/REMARKS**

*otential Radioactive contamination, potential beryllium ontamination*

**pecial Handling and/or Storage**

*one*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | | | |
| Type of Container | aG | aG | aG | P | P | P | | | | | |
| No. of Container(s) | 1 | 1 | 0 | 0 | 0 | 1 | | | | | |
| Volume | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | | | |
| SAMPLE ANALYSIS | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. | | | | | PIN # |
| Sample No. / Matrix * / Sample Date / Sample Time | | | | | | | | | | | |
| 78L4 / OTHER / 8/18/08 / 0900 | | X | X | X | X | | | | | | 5901 |
| 78L5 / OTHER / " / 0915 | | X | X | X | X | | | | | | 5475 |
| 78L6 / OTHER / " / 0940 | | X | X | X | X | | | | | | 5954 |
| 78L7 / OTHER / " / 0950 | X | X | X | X | X | | | | | | 5952 |
| 78L8 / OTHER / 8/18/08 / 1020 | X | X | X | X | X | | | | | | 5777 |

RTC 8/18/08

pd 9/3/08

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Laurence | 1300 8-19-08 | R. Fahlberg R. Fahlberg | 1300 8-19-08 |
| R. Fahlberg R. Fahlberg 8-19-08 | 1500 | RT COFFMAN / RT Coffman | 1500 8/19/08 |
| COFFMAN / RT Coffman RTC 9/3/08 | 1215 | M.S. Stankovich | 1215 9/3/08 |
| M.S. Stankovich 9/3/08 | 1215 | Ground | |
| ROADWAY | 9-9-08 1545 | | 9-9-08 1545 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Arsenic, Lead, Selenium, Thallium, Tin, Zirconium}; Mercury - 7471 - (CV)

(2) Gross Alpha; Gross Beta; Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Uranium; Isotopic Thorium; Americium-241; Isotopic Plutonium; Strontium-89,90 -- Total Sr

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
Ve=Vegetation
X=Other

| | | | |
|---|---|---|---|
| BORATORY SECTION | Received By | Title | Date/Time |
| IAL SAMPLE SPOSITION | Disposal Method | Disposed By | Date/Time |

H-EE-011

Lionville Laboratory Incorporated

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: W.C. Hanford

Project/SAP/SOW/Release #: RC-088

Date: 9/9/08

LvLI Batch #: 08091076

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier ROADWAY ~~FedEx~~ [illegible] 9-10-08 | | Airbill # 868043436-4 ~~7905 7304 2908~~ [illegible] 9-10-08 |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☐ Yes | ☐ No | ☑ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 8.3 8.4 °C | | Cooler # Box ~~Box~~ ~~FRC 11-056~~ [illegible] 9-10-08 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify): |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☐ Yes | ☑ No | |
| 6. Custody seals on sample containers intact, signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvLI) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No #001 Leaked into Bag | |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☐ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no, then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| 13. VOA, TOC, TOX free of headspace? | ☑ Yes | ☐ No | ☐ N/A |
| 14. QC stickers placed on bottles designated by client? | ☐ Yes | ☐ No | ☑ N/A |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☐ Yes | ☑ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☑ Yes | ☐ No | ☐ N/A |
| Person Contacted D. JOHNSON | | Date 9-9-08 | |

LvLI LIONVILLE LABORATORIES

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-088 K1322

RECEIVED
OCT 2008

DATE RECEIVED: 09/10/08 LVL LOT # :0809L076

| CLIENT ID | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| J178L4 | 001 | OI | 08LE0433 | 08/18/08 | 09/12/08 | 09/12/08 |
| J178L4 | 001 MS | OI | 08LE0433 | 08/18/08 | 09/12/08 | 09/12/08 |
| J178L4 | 001 MSD | OI | 08LE0433 | 08/18/08 | 09/12/08 | 09/12/08 |
| J178L5 | 002 | OI | 08LE0433 | 08/18/08 | 09/12/08 | 09/12/08 |
| J178L6 | 003 | OI | 08LE0433 | 08/18/08 | 09/12/08 | 09/15/08 |
| J178L7 | 004 | OI | 08LE0433 | 08/18/08 | 09/12/08 | 09/16/08 |
| J178L8 | 005 | OI | 08LE0433 | 08/18/08 | 09/12/08 | 09/16/08 |
| LAB QC: | | | | | | |
| SBLKXP | MB1 | OI | 08LE0433 | N/A | 09/12/08 | 09/12/08 |
| SBLKXP | MB1 BS | OI | 08LE0433 | N/A | 09/12/08 | 09/12/08 |

LIONVILLE LABORATORY INC.

**Case Narrative**

**Client:** WC-HANFORD RC-088 K1322
**LVL #:** 0809L076

**W.O. #:** 60049-001-001-0001-00
**Date Received:** 09-10-2008

**SEMIVOLATILE**

Five (5) oil samples were collected on 08-18-2008.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3580A (Waste Dilution Protocol, 1g into 10mL DCM) on 09-12-2008 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 09-12,15,16-2008.

The following is a summary of QC results accompanying the sample results. Lionville Laboratory (LVL) certifies that all test results meet the requirements of NELAC except as noted below:

1. The results presented in this report are derived from samples that did not meet LvLs sample acceptance policy. Please refer to the sample receipt checklist for detailed discrepancy information.

2. Samples were received outside of the recommended hold time of 14 days. The samples were extracted within two days of receipt and subsequently analyzed within hold time.

3. Non-target compounds were detected in these samples.

4. All samples had a 10-fold dilution at the extraction level and an adjusted final volume of 2.1 ml resulting in a 21X dilution factor. Due to high levels of non-target analytes, the following samples required an additional 5X instrument dilution: J178L4, J178L4MS, J178L4MSD, J178L5, J178L6. Reporting limits have been adjusted to reflect the necessary dilutions.

5. Three (3) of 54 surrogate recoveries were outside acceptance criteria. The surrogate recoveries for sample J178L5 were biased high; there is minimal impact on the data.

6. Seven (7) of one hundred twenty-eight (128) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 08MS204) has been enclosed. Several matrix spike recoveries were unobtainable due to sample dilutions required for analysis.

r:\group\data\2008\bna\tmu\0809-076ojoi2.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 21 pages.

LIONVILLE LABORATORY INC.

7. All blank spike recoveries were within acceptance criteria.

8. The method blank was below the reporting limits for all target compounds.

9. All initial calibrations associated with this data set were within acceptance criteria.

10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

11. Internal standard area and retention time criteria were met.

12. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

13. LVL is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

9/30/08
Date

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 08ms204

Initiator: Sharon Saylor
Date: 9-17-08
Client: WC-Hanford RC088 K1322

Batch: 08091076
Samples: ms, msd
Method: SW846/MCAWW/CLP/

Parameter: 8270
Matrix: oil
Prep Batch: OF1G0433

**1. Reason for SDR**

**a. COC Discrepancy** __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

**b. General Discrepancy**

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

**c. Problem** (Include all relevant specific results; attach data if necessary)

no or low recovery of several spike analytes in the ms, msd but BS is ok (2nitrophenol, 4nitrophenol, 4,6 Dinitro-2methylphenol, 24dinitrophenol)

**2. Known or Probable Causes(s)** possible matrix effect, hydrocarbon contamination, large unresolved chromatographic peak btn 15-30 minutes. Samples required a 5 fold dilution due to the matrix (oil). Acidic phenols are subject to erratic chromatographic behavior especially if the GC system is contaminated with high boiling material.

**3. Discussion and Proposed Action** Other Description:

narrate

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

**4. Project Manager Instructions**...signature/date: 9/17/08

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

**5. Final Action**...signature/date: 9/29/08 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
✓ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

**When Final Action has been recorded, forward original to QA for diposition.**

Route
__ Lab Manager: Daniels
1 Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS VOA: Rubino / _____
2 MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

# GLOSSARY

## DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

A = Indicates that a TIC is a suspected aldol-condensation product.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

# GLOSSARY

## ABBREVIATIONS

| | | |
|---|---|---|
| BS | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported. |
| BSD | = | Indicates blank spike duplicate. |
| MS | = | Indicates matrix spike. |
| MSD | = | Indicates matrix spike duplicate. |
| DL | = | Suffix added to sample number to indicate that results are from a diluted analysis. |
| NA | = | Not Applicable. |
| DF | = | Dilution Factor. |
| NR | = | Not Required. |
| SP, Z | = | Indicates Spiked Compound. |

## TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

MP - Missed Peak: manually added peak not found by automatic quan program.

PA - Peak Assignment: quan report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

| | Cust ID: | J178L4 | J178L4 | J178L4 | J178L5 | J178L6 | J178L7 |
|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | 001 MS | 001 MSD | 002 | 003 | 004 |
| | Matrix: | OIL | OIL | OIL | OIL | OIL | OIL |
| | D.F.: | 105 | 105 | 105 | 105 | 105 | 21.0 |
| | Units: | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| Surrogate Recovery | Nitrobenzene-d5 | 66 % | 107 % | 97 % | 170 * % | 87 % | 90 % |
| | 2-Fluorobiphenyl | 93 % | 115 % | 103 % | 142 * % | 96 % | 101 % |
| | Terphenyl-d14 | 102 % | 111 % | 105 % | 128 % | 93 % | 96 % |
| | Phenol-d5 | 80 % | 104 % | 85 % | 130 * % | 76 % | 102 % |
| | 2-Fluorophenol | 84 % | 98 % | 86 % | 113 % | 95 % | 101 % |
| | 2,4,6-Tribromophenol | 88 % | 116 % | 113 % | 93 % | 69 % | 88 % |
| | | fl | fl | fl | fl | fl | fl |
| Phenol | | 1000000 U | 86 % | 78 % | 1000000 U | 1000000 U | 210000 U |
| bis(2-Chloroethyl)ether | | 1000000 U | 108 % | 104 % | 1000000 U | 1000000 U | 210000 U |
| 2-Chlorophenol | | 1000000 U | 93 % | 78 % | 1000000 U | 1000000 U | 210000 U |
| 1,3-Dichlorobenzene | | 1000000 U | 100 % | 86 % | 1000000 U | 1000000 U | 210000 U |
| 1,4-Dichlorobenzene | | 1000000 U | 94 % | 87 % | 1000000 U | 1000000 U | 210000 U |
| 1,2-Dichlorobenzene | | 1000000 U | 97 % | 88 % | 1000000 U | 1000000 U | 210000 U |
| 2-Methylphenol | | 1000000 U | 94 % | 89 % | 1000000 U | 1000000 U | 210000 U |
| 2,2'-oxybis(1-Chloropropane) | | 1000000 U | 120 % | 111 % | 1000000 U | 1000000 U | 210000 U |
| 3/4 Methylphenol | | 1000000 U | 86 % | 76 % | 1000000 U | 1000000 U | 210000 U |
| N-Nitroso-di-n-propylamine | | 1000000 U | 113 % | 89 % | 1000000 U | 1000000 U | 210000 U |
| Hexachloroethane | | 1000000 U | 89 % | 76 % | 1000000 U | 1000000 U | 210000 U |
| Nitrobenzene | | 1000000 U | 78 % | 82 % | 1000000 U | 1000000 U | 210000 U |
| Isophorone | | 1000000 U | 85 % | 86 % | 1000000 U | 1000000 U | 210000 U |
| 2-Nitrophenol | | 1000000 U | 31 * % | 29 * % | 1000000 U | 1000000 U | 210000 U |
| 2,4-Dimethylphenol | | 1000000 U | 92 % | 98 % | 1000000 U | 1000000 U | 210000 U |
| bis(2-Chloroethoxy)methane | | 1000000 U | 103 % | 97 % | 1000000 U | 1000000 U | 210000 U |
| 2,4-Dichlorophenol | | 1000000 U | 88 % | 90 % | 1000000 U | 1000000 U | 210000 U |
| 1,2,4-Trichlorobenzene | | 1000000 U | 95 % | 97 % | 1000000 U | 1000000 U | 210000 U |
| Naphthalene | | 1000000 U | 87 % | 89 % | 1000000 U | 1000000 U | 210000 U |
| 4-Chloroaniline | | 1000000 U | 82 % | 80 % | 1000000 U | 1000000 U | 210000 U |
| Hexachlorobutadiene | | 1000000 U | 83 % | 97 % | 1000000 U | 1000000 U | 210000 U |
| 4-Chloro-3-methylphenol | | 1000000 U | 83 % | 91 % | 1000000 U | 1000000 U | 210000 U |
| 2-Methylnaphthalene | | 1000000 U | 95 % | 101 * % | 58000 J | 1000000 U | 210000 U |
| Hexachlorocyclopentadiene | | 1000000 U | 50 % | 46 % | 1000000 U | 1000000 U | 210000 U |
| 2,4,6-Trichlorophenol | | 1000000 U | 99 % | 99 % | 1000000 U | 1000000 U | 210000 U |
| 2,4,5-Trichlorophenol | | 2600000 U | 87 % | 98 % | 2600000 U | 2600000 U | 520000 U |

*= Outside of EPA CLP QC limits.

000000008

RFW Batch Number: 0809L076 Client: WC-HANFORD RC-000 R1522 Work Order: 0809L076001 Page: 22

| Cust ID: | J178L4 | J178L4 | J178L4 | J178L5 | J178L6 | J178L7 |
|---|---|---|---|---|---|---|
| RFW#: | 001 | 001 MS | 001 MSD | 002 | 003 | 004 |
| 2-Chloronaphthalene | 1000000 U | 101 % | 108 % | 1000000 U | 1000000 U | 210000 U |
| 2-Nitroaniline | 2600000 U | 75 % | 79 % | 2600000 U | 2600000 U | 520000 U |
| Dimethylphthalate | 1000000 U | 113 % | 114 % | 1000000 U | 1000000 U | 210000 U |
| Acenaphthylene | 1000000 U | 116 % | 107 % | 1000000 U | 1000000 U | 210000 U |
| 2,6-Dinitrotoluene | 1000000 U | 87 % | 79 % | 1000000 U | 1000000 U | 210000 U |
| 3-Nitroaniline | 2600000 U | 82 % | 95 % | 2600000 U | 2600000 U | 520000 U |
| Acenaphthene | 1000000 U | 101 % | 103 % | 1000000 U | 1000000 U | 210000 U |
| 2,4-Dinitrophenol | 2600000 U | D % | D % | 2600000 U | 2600000 U | 520000 U |
| 4-Nitrophenol | 2600000 U | 24 * % | 62 % | 2600000 U | 2600000 U | 520000 U |
| Dibenzofuran | 1000000 U | 110 % | 95 % | 1000000 U | 1000000 U | 210000 U |
| 2,4-Dinitrotoluene | 1000000 U | 105 % | 95 % | 1000000 U | 1000000 U | 210000 U |
| Diethylphthalate | 1000000 U | 103 % | 104 % | 1000000 U | 1000000 U | 210000 U |
| 4-Chlorophenyl-phenylether | 1000000 U | 126 * % | 113 % | 1000000 U | 1000000 U | 210000 U |
| Fluorene | 100000 J | 96 % | 86 % | 180000 J | 150000 J | 210000 U |
| 4-Nitroaniline | 2600000 U | 53 % | 63 % | 2600000 U | 2600000 U | 520000 U |
| 4,6-Dinitro-2-methylphenol | 2600000 U | 14 * % | D % | 2600000 U | 2600000 U | 520000 U |
| N-Nitrosodiphenylamine (1) | 1000000 U | 146 * % | 118 % | 1000000 U | 1000000 U | 210000 U |
| 4-Bromophenyl-phenylether | 1000000 U | 108 % | 107 % | 1000000 U | 1000000 U | 210000 U |
| Hexachlorobenzene | 1000000 U | 98 % | 100 % | 1000000 U | 1000000 U | 210000 U |
| Pentachlorophenol | 2600000 U | 77 % | 82 % | 2600000 U | 2600000 U | 520000 U |
| Phenanthrene | 260000 J | 110 % | 94 % | 310000 J | 200000 J | 210000 U |
| Anthracene | 1000000 U | 106 % | 112 % | 1000000 U | 1000000 U | 210000 U |
| Carbazole | 1000000 U | 101 % | 101 % | 1000000 U | 1000000 U | 210000 U |
| Di-n-butylphthalate | 1000000 U | 133 % | 122 % | 1000000 U | 1000000 U | 210000 U |
| Fluoranthene | 1000000 U | 111 % | 101 % | 1000000 U | 1000000 U | 210000 U |
| Pyrene | 1000000 U | 104 % | 96 % | 1000000 U | 1000000 U | 210000 U |
| Butylbenzylphthalate | 1000000 U | 148 % | 134 % | 1000000 U | 1000000 U | 210000 U |
| 3,3'-Dichlorobenzidine | 1000000 U | 95 % | 89 % | 1000000 U | 1000000 U | 210000 U |
| Benzo(a)anthracene | 1000000 U | 100 % | 102 % | 1000000 U | 1000000 U | 210000 U |
| Chrysene | 1000000 U | 106 % | 100 % | 1000000 U | 1000000 U | 210000 U |
| bis(2-Ethylhexyl)phthalate | 1000000 U | 120 % | 112 % | 1000000 U | 1000000 U | 210000 U |
| Di-n-octyl phthalate | 1000000 U | 107 % | 99 % | 1000000 U | 1000000 U | 210000 U |
| Benzo(b)fluoranthene | 1000000 U | 90 % | 78 % | 1000000 U | 1000000 U | 210000 U |
| Benzo(k)fluoranthene | 1000000 U | 87 % | 90 % | 1000000 U | 1000000 U | 210000 U |
| Benzo(a)pyrene | 1000000 U | 93 % | 88 % | 1000000 U | 1000000 U | 210000 U |
| Indeno(1,2,3-cd)pyrene | 1000000 U | 90 % | 88 % | 1000000 U | 1000000 U | 210000 U |
| Dibenz(a,h)anthracene | 1000000 U | 100 % | 83 % | 1000000 U | 1000000 U | 210000 U |
| Benzo(g,h,i)perylene | 1000000 U | 100 % | 93 % | 1000000 U | 1000000 U | 210000 U |

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

000000009

| | Cust ID: | J178L8 | | SBLKXP | | SBLKXP BS | |
|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 005 | | 08LE0433-MB1 | | 08LE0433-MB1 | |
| | Matrix: | OIL | | OIL | | OIL | |
| | D.F.: | 21.0 | | 21.0 | | 21.0 | |
| | Units: | ug/Kg | | ug/Kg | | ug/Kg | |
| Surrogate Recovery | Nitrobenzene-d5 | 94 | % | 84 | % | 92 | % |
| | 2-Fluorobiphenyl | 103 | % | 94 | % | 88 | % |
| | Terphenyl-d14 | 94 | % | 92 | % | 102 | % |
| | Phenol-d5 | 95 | % | 82 | % | 95 | % |
| | 2-Fluorophenol | 103 | % | 91 | % | 95 | % |
| | 2,4,6-Tribromophenol | 86 | % | 90 | % | 99 | % |
| Phenol | | 210000 | U | 210000 | U | 87 | % |
| bis(2-Chloroethyl)ether | | 210000 | U | 210000 | U | 107 | % |
| 2-Chlorophenol | | 210000 | U | 210000 | U | 86 | % |
| 1,3-Dichlorobenzene | | 210000 | U | 210000 | U | 91 | % |
| 1,4-Dichlorobenzene | | 210000 | U | 210000 | U | 96 | % |
| 1,2-Dichlorobenzene | | 210000 | U | 210000 | U | 93 | % |
| 2-Methylphenol | | 210000 | U | 210000 | U | 92 | % |
| 2,2'-oxybis(1-Chloropropane) | | 210000 | U | 210000 | U | 109 | % |
| 3/4 Methylphenol | | 210000 | U | 210000 | U | 84 | % |
| N-Nitroso-di-n-propylamine | | 210000 | U | 210000 | U | 110 | % |
| Hexachloroethane | | 210000 | U | 210000 | U | 94 | % |
| Nitrobenzene | | 210000 | U | 210000 | U | 86 | % |
| Isophorone | | 210000 | U | 210000 | U | 85 | % |
| 2-Nitrophenol | | 210000 | U | 210000 | U | 77 | % |
| 2,4-Dimethylphenol | | 210000 | U | 210000 | U | 99 | % |
| bis(2-Chloroethoxy)methane | | 210000 | U | 210000 | U | 101 | % |
| 2,4-Dichlorophenol | | 210000 | U | 210000 | U | 90 | % |
| 1,2,4-Trichlorobenzene | | 210000 | U | 210000 | U | 84 | % |
| Naphthalene | | 210000 | U | 210000 | U | 88 | % |
| 4-Chloroaniline | | 210000 | U | 210000 | U | 84 | % |
| Hexachlorobutadiene | | 210000 | U | 210000 | U | 87 | % |
| 4-Chloro-3-methylphenol | | 210000 | U | 210000 | U | 90 | % |
| 2-Methylnaphthalene | | 210000 | U | 210000 | U | 93 | % |
| Hexachlorocyclopentadiene | | 210000 | U | 210000 | U | 77 | % |
| 2,4,6-Trichlorophenol | | 210000 | U | 210000 | U | 88 | % |
| 2,4,5-Trichlorophenol | | 520000 | U | 520000 | U | 92 | % |

*= Outside of EPA CLP QC limits.

000000010

| Cust ID: | J178L8 | | SBLKXP | | SBLKXP BS | |
|---|---|---|---|---|---|---|
| RFW#: | 005 | | 08LE0433-MB1 | | 08LE0433-MB1 | |
| 2-Chloronaphthalene | 210000 | U | 210000 | U | 85 | % |
| 2-Nitroaniline | 520000 | U | 520000 | U | 86 | % |
| Dimethylphthalate | 210000 | U | 210000 | U | 99 | % |
| Acenaphthylene | 210000 | U | 210000 | U | 89 | % |
| 2,6-Dinitrotoluene | 210000 | U | 210000 | U | 84 | % |
| 3-Nitroaniline | 520000 | U | 520000 | U | 77 | % |
| Acenaphthene | 210000 | U | 210000 | U | 87 | % |
| 2,4-Dinitrophenol | 520000 | U | 520000 | U | 77 | % |
| 4-Nitrophenol | 520000 | U | 520000 | U | 72 | % |
| Dibenzofuran | 210000 | U | 210000 | U | 90 | % |
| 2,4-Dinitrotoluene | 210000 | U | 210000 | U | 89 | % |
| Diethylphthalate | 210000 | U | 210000 | U | 99 | % |
| 4-Chlorophenyl-phenylether | 210000 | U | 210000 | U | 96 | % |
| Fluorene | 210000 | U | 210000 | U | 87 | % |
| 4-Nitroaniline | 520000 | U | 520000 | U | 72 | % |
| 4,6-Dinitro-2-methylphenol | 520000 | U | 520000 | U | 95 | % |
| N-Nitrosodiphenylamine (1) | 210000 | U | 210000 | U | 88 | % |
| 4-Bromophenyl-phenylether | 210000 | U | 210000 | U | 87 | % |
| Hexachlorobenzene | 210000 | U | 210000 | U | 87 | % |
| Pentachlorophenol | 520000 | U | 520000 | U | 117 | % |
| Phenanthrene | 210000 | U | 210000 | U | 94 | % |
| Anthracene | 210000 | U | 210000 | U | 95 | % |
| Carbazole | 210000 | U | 210000 | U | 86 | % |
| Di-n-butylphthalate | 210000 | U | 210000 | U | 109 | % |
| Fluoranthene | 210000 | U | 210000 | U | 96 | % |
| Pyrene | 210000 | U | 210000 | U | 92 | % |
| Butylbenzylphthalate | 210000 | U | 210000 | U | 115 | % |
| 3,3'-Dichlorobenzidine | 210000 | U | 210000 | U | 82 | % |
| Benzo(a)anthracene | 210000 | U | 210000 | U | 88 | % |
| Chrysene | 210000 | U | 210000 | U | 92 | % |
| bis(2-Ethylhexyl)phthalate | 210000 | U | 210000 | U | 104 | % |
| Di-n-octyl phthalate | 210000 | U | 210000 | U | 106 | % |
| Benzo(b)fluoranthene | 210000 | U | 210000 | U | 82 | % |
| Benzo(k)fluoranthene | 210000 | U | 210000 | U | 84 | % |
| Benzo(a)pyrene | 210000 | U | 210000 | U | 83 | % |
| Indeno(1,2,3-cd)pyrene | 210000 | U | 210000 | U | 82 | % |
| Dibenz(a,h)anthracene | 210000 | U | 210000 | U | 84 | % |
| Benzo(g,h,i)perylene | 210000 | U | 210000 | U | 84 | % |

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

J178L4

Lab Name: Lionville Labs, Inc. Work Order: 60049001001

Client: WC-HANFORD RC-088 K1322

Matrix: (soil/water) OIL

Lab Sample ID: 0809L076-001

Sample wt/vol: 1.00 (g/mL) G

Lab File ID: C091210

Level: (low/med) LOW

Date Received: 09/10/08

% Moisture: 100 decanted: (Y/N)__

Date Extracted: 09/12/08

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 09/12/08

Injection Volume: 2.0(uL)

Dilution Factor: 105

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | TRIMETRHYLNAPHTHALENE | 18.635 | 3000000 | J |
| 2. | UNKNOWN | 18.816 | 3000000 | J |
| 3. | ALKANE | 19.806 | 3000000 | J |
| 4. | PAH | 20.219 | 2000000 | J |
| 5. | PAH | 20.702 | 3000000 | J |

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

J178L5

Lab Name: Lionville Labs, Inc. Work Order: 60049001001

Client: WC-HANFORD RC-088 K1322

Matrix: (soil/water) OIL

Lab Sample ID: 0809L076-002

Sample wt/vol: 1.00 (g/mL) G

Lab File ID: D091209

Level: (low/med) LOW

Date Received: 09/10/08

% Moisture: 100 decanted: (Y/N)__

Date Extracted: 09/12/08

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 09/12/08

Injection Volume: 2.0(uL)

Dilution Factor: 105

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | UNKNOWN | 17.730 | 2000000 | J |
| 2. | TRIMETHYLNAPHTHALENE | 18.783 | 4000000 | J |
| 3. | TRIMETHYNAPHTHALENE | 18.959 | 3000000 | J |
| 4. | TRIMETHYLNAPHTHALENE | 19.284 | 2000000 | J |
| 5. | PAH | 20.003 | 3000000 | J |

FORM 1 SV-TIC RFW (v3.3)

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

J178L6

Lab Name: Lionville Labs, Inc. Work Order: 60049001001

Client: WC-HANFORD RC-088 K1322

Matrix: (soil/water) OIL

Lab Sample ID: 0809L076-003

Sample wt/vol: 1.00 (g/mL) G

Lab File ID: C091510

Level: (low/med) LOW

Date Received: 09/10/08

% Moisture: 100 decanted: (Y/N)__

Date Extracted: 09/12/08

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 09/15/08

Injection Volume: 2.0(uL)

Dilution Factor: 105

GPC Cleanup: (Y/N) N

pH: _____

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | UNKNOWN | 16.970 | 2000000 | J |
| 2. 80655-44-3 | DECAHYDRO-4,4,8,9,10-PENTAME | 17.478 | 2000000 | JN |
| 3. | TRIMETHYLNAPHTHALENE | 18.555 | 2000000 | J |
| 4. | UNKNOWN | 18.744 | 3000000 | J |
| 5. | TRIMETHYLNAPHTAHLENE | 19.123 | 2000000 | J |

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

J178L7

Lab Name: Lionville Labs, Inc. Work Order: 60049001001

Client: WC-HANFORD RC-088 K1322

Matrix: (soil/water) OIL

Lab Sample ID: 0809L076-004

Sample wt/vol: 1.00 (g/mL) G

Lab File ID: C091612

Level: (low/med) LOW

Date Received: 09/10/08

% Moisture: 100 decanted: (Y/N)__

Date Extracted: 09/12/08

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 09/16/08

Injection Volume: 2.0(uL)

Dilution Factor: 21.0

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

FORM 1 SV-TIC RFW (v3.3)

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

J178L8

Lab Name: Lionville Labs, Inc. Work Order: 60049001001

Client: WC-HANFORD RC-088 K1322

Matrix: (soil/water) OIL

Lab Sample ID: 0809L076-005

Sample wt/vol: 1.00 (g/mL) G

Lab File ID: C091613

Level: (low/med) LOW

Date Received: 09/10/08

% Moisture: 100 decanted: (Y/N)__

Date Extracted: 09/12/08

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 09/16/08

Injection Volume: 2.0(uL)

Dilution Factor: 21.0

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKXP

Lab Name: Lionville Labs, Inc. Work Order: 60049001001

Client: WC-HANFORD RC-088 K1322

Matrix: (soil/water) OIL

Lab Sample ID: 08LE0433-MB1

Sample wt/vol: 1.00 (g/mL) G

Lab File ID: C091209

Level: (low/med) LOW

Date Received: 09/12/08

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 09/12/08

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 09/12/08

Injection Volume: 2.0(uL)

Dilution Factor: 21.0

GPC Cleanup: (Y/N) N

pH: _____

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | | | | |

FORM 1 SV-TIC

RFW (v3.3)

ville Laboratory Use Only

809L076

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

LVLI

000000018

nt W. C. HANFORD SAPH RC-088

Final Proj. Sampling Date

ect# 60049-001-001-0001-00

ect Contact/Phone#

ville Laboratory Project Manager O. JOHNSON

SW846 Del STD TAT 7 days

Rec'd 9-10-08 Date Due 9-17-08

| | | A | B |
|---|---|---|---|
| Refrigerator # | | 6 | 3 |
| #/Type Container | Liquid | 1G | 1G |
| | Solid | | |
| Volume | | 60/40 | 250 |
| Preservatives | | — | — |

ANALYSES REQUESTED →

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | ORGANIC VOA | BNA | Pest/PCB | Herb | | | | INORG ICP Metal | Hg | CN | Ignitability | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lionville Laboratory Use Only | | | | | | | | | | | | | | |
| | | | | | | | 0624H | 0625H | OPCB | | | | | Met① | | | IGN | | | | |
| 001 | J178L4 | | | oil | 8-8-08 | 0900 | | X | X | | | | | X | | | X | | | | |
| 002 | 5 | | | | | 0915 | | X | X | | | | | X | | | X | | | | |
| 003 | 6 | | | | | 0940 | | X | X | | | | | X | | | X | | | | |
| 004 | 7 | | | | | 0950 | X | X | X | | | | | X | | | X | | | | |
| 005 | 8 | | | | | 1020 | X | X | X | | | | | X | | | X | | | | |
| ~~006~~ | ~~J17H40~~ | | | ~~oil~~ | ~~8-8-08~~ | ~~0950~~ | | | | | | | | | | | | | | | |
| 007 | 41 | | | | | 1005 | | | | | | | | | | | | | | | |
| 008 | 42 | | | | | 1200 | | | | | | | | | | | | | | | |
| 009 | 43 | | | | | 1305 | | | | | | | | | | | | | | | |
| 010 | 44 | | | | | 1320 | | | | | | | | | | | | | | | |

RIX
ES:
Soil
Sediment
Solid
Sludge
Water
Oil
Air
Drum Solids
Drum Liquids
EP/TCLP
Leachate
Wipe
Other
Fish

cial Instructions: X=oil

Met① = HSL + Sn, Zn

Run Matrix QC

**Special Instructions:**

1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| D Way | [signature] | 9-9-08 | 1545 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |

| Relinquished | Received by | Date | Time |
|---|---|---|---|
| ORIGINAL REWRITTEN | | "COMPOSITE WASTE" | |

**Washington Closure Hanford**

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-088-062



| | | | |
|---|---|---|---|
| Collector: B. Lawrence | Company Contact: Joan Kessner | Telephone No.: 509-375-4688 | Project Coordinator: KESSNER, JH |
| Price Code | Data Turnaround: ~~15 Days~~ 7 days eg. 8/10/08 | | |
| Project Designation: 618-7 Burial Ground - Other | Sampling Location: 618-7 Burial Ground (drums) | | SAF No.: RC-088 |
| Ice Chest No.: Haz Mat Box | Field Logbook No.: EL-1395-13 | COA: RG61878500 | Method of Shipment: Expedited Ground |
| Shipped To: EBERLINE SERVICES LIONVILLE | Offsite Property No.: see HSMR | | Bill of Lading/Air Bill No.: see HSMR |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radioactive contamination, potential beryllium contamination*

**Special Handling and/or Storage**

*none*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | | | |
| Type of Container | aG | aG | aG | P | P | P | | | | | |
| No. of Container(s) | 1 | 1 | 0 | 0 | 0 | 1 | | | | | |
| Volume | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | | | |
| SAMPLE ANALYSIS | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. RTC 8/18/08 | | | | | PIN # |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| 78L4 | OTHER | 8/18/08 | 0900 | | X | X | X | X | | | 5901 |
| 78L5 | OTHER | | 0915 | | X | X | X | X | | | 5475 |
| 78L6 | OTHER | | 0940 | | X | X | X | X | | | 5954 |
| 78L7 | OTHER | | 0950 | X | X | X | X | X | | | 5952 |
| 78L8 | OTHER | 8/18/08 | 1020 | X | X | X | X | X | | | 5777 |

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Lawrence | 8-19-08 1300 | R. Fahlberg R. Fahlberg | 8-19-08 1300 |
| R. Fahlberg R. Fahlberg | 8-19-08 1500 | RT COFFMAN / RT Coffman | 8/19/08 1500 |
| RT COFFMAN / RT Coffman | 8-9/3/08 1215 | M. Stankovich | 9/3/08 1215 |
| M. Stankovich | 9/3/08 1215 | Ground | |
| ROADWAY | 9-9-08 1545 | | 9-9-08 1545 |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Arsenic, Lead, Selenium, Thallium, Tin, Zirconium}; Mercury - 7471 - (CV)

(2) Gross Alpha; Gross Beta; Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Uranium; Isotopic Thorium; Americium-241; Isotopic Plutonium; Strontium-89,90 -- Total Sr

**Matrix ***

S=Soil
SB=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

H-EE-011

000000019

# Washington Closure Hanford

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-088-062 | Page 1 of 1

| | | | |
|---|---|---|---|
| lector<br>3. Lawrence | Company Contact<br>Joan Kessner | Telephone No.<br>509-375-4688 | Project Coordinator<br>KESSNER, JH |
| Price Code | Data Turnaround<br>~~15~~ Days<br>7 Day by 9/10/08 | | |
| ject Designation<br>618-7 Burial Ground - Other | Sampling Location<br>618-7 Burial Ground (drums) | | SAF No.<br>RC-088 |
| Chest No.<br>Haz Mat Box | Field Logbook No.<br>EL-1395-13 | COA<br>RG61878500 | Method of Shipment<br>Expedited Ground |
| ipped To<br>EBERLINE SERVICES (LIONVILLE) | Offsite Property No.<br>see HSMK | | Bill of Lading/Air Bill No.<br>see HSMK |

0000000020

**OSSIBLE SAMPLE HAZARDS/REMARKS**

*otential Radioactive contamination, potential beryllium ntamination*

**pecial Handling and/or Storage**

*one*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | | | |
| Type of Container | aG | aG | aG | P | P | P | | | | | |
| No. of Container(s) | 1 | 1 | 0 | 0 | 0 | 1 | | | | | |
| Volume | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | | | |
| SAMPLE ANALYSIS | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. RTC 8/18/08 | | | | | PIN # |
| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | |
| ~~78L4~~ NH 8/8/08 | OTHER | 8/18/08 | 0900 | | X | X | X | X | | | 5901 |
| 78L5 | OTHER | | 0915 | | X | X | X | X | | | 5475 |
| 78L6 | OTHER | | 0940 | | X | X | X | X | | | 5954 |
| 78L7 | OTHER | | 0950 | X | X | X | X | X | | | 5952 |
| 78L8 | OTHER | 8/18/08 | 1020 | X | X | X | X | X | | | 5777 |

| CHAIN OF POSSESSION | Sign/Print Names | |
|---|---|---|
| nquished By/Removed From<br>Lawrence | Date/Time 1300<br>8-19-08 | Received By/Stored In<br>R. Fahlberg R. Fahlberg 8-19-08 | Date/Time 1300 |
| nquished By/Removed From<br>R. Fahlberg R. Fahlberg 8-19-08 | Date/Time 1500 | Received By/Stored In<br>RT COFFMAN/RT Coffman 8/19/08 | Date/Time 1500 |
| nquished By/Removed From<br>RT COFFMAN/RT Coffman 8-19-08 | Date/Time 1215 | Received By/Stored In<br>M Stankovich 9/3/08 | Date/Time 1215 |
| nquished By/Removed From<br>M Stankovich 9/3/08 | Date/Time 1215 | Received By/Stored In<br>Ground | Date/Time |
| nquished By/Removed From<br>Fed Ex Ground 9-9-08 1545 | Date/Time | Received By/Stored In<br>9-9-08 1545 | Date/Time |
| nquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Arsenic, Lead, Selenium, Thallium, Tin, Zirconium}; Mercury - 7471 - (CV)

(2) Gross Alpha; Gross Beta; Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Uranium; Isotopic Thorium; Americium-241; Isotopic Plutonium; Strontium-89,90 -- Total Sr

Matrix *

S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| NAL SAMPLE ISPOSITION | Disposal Method | Disposed By | Date/Time |

CH-EE-011

Lionville Laboratory Incorporated

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: W.C. Hanford

Project/SAP/SOW/Release #: RC-088

Date: 9/9/08

LvLI Batch #: 08094076

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier ROADWAY ~~FEDEX~~ | | Airbill # 868043436-4 ~~7905 7304 2908~~ |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☐ Yes | ☐ No | ☑ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 8.3 8.4 | °C | Cooler # Box Box ~~ERC 99-056~~ |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify): |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☐ Yes | ☑ No | |
| 6. Custody seals on sample containers intact, signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvLI) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No | #001 Leaked into Bag |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☐ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no, then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| 13. VOA, TOC, TOX free of headspace? | ☑ Yes | ☐ No | ☐ N/A |
| 14. QC stickers placed on bottles designated by client? | ☐ Yes | ☐ No | ☑ N/A |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☐ Yes | ☑ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☑ Yes | ☐ No | ☐ N/A |

Person Contacted D. JOHNSON Date 9-9-08

LVLI LIONVILLE LABORATORIES

RECEIVED
OCT 2008

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
WC-HANFORD RC-088 K1322

DATE RECEIVED: 09/10/08 LVL LOT # :0809L076

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| J178L4 | | | | | | |
| IGNITABILITY | 001 | OI | 08LFP029 | 08/18/08 | 09/11/08 | 09/11/08 |
| J178L5 | | | | | | |
| IGNITABILITY | 002 | OI | 08LFP029 | 08/18/08 | 09/11/08 | 09/11/08 |
| J178L6 | | | | | | |
| IGNITABILITY | 003 | OI | 08LFP029 | 08/18/08 | 09/11/08 | 09/11/08 |
| J178L7 | | | | | | |
| IGNITABILITY | 004 | OI | 08LFP029 | 08/18/08 | 09/11/08 | 09/11/08 |
| J178L8 | | | | | | |
| IGNITABILITY | 005 | OI | 08LFP029 | 08/18/08 | 09/11/08 | 09/11/08 |
| LAB QC: | | | | | | |
| IGNITEABILITY | MB1 BS | W | 08LFP029 | N/A | 09/11/08 | 09/11/08 |

LIONVILLE LABORATORY INC.

**Analytical Report**

**Client:** WC-HANFORD RC-088 K1322
**LVL#:** 0809L076

**W.O.#:** 60049-001-001-0001-00
**Date Received:** 09-10-08

## INORGANIC NARRATIVE

1. This narrative covers the analysis of 5 liquid samples.

2. The samples were prepared and analyzed in accordance with the method checked on the attached glossary.

3. Sample holding time as required by the method and/or contract was met.

4. The results presented in this report are derived from samples that did not meet the LVL sample acceptance policy as noted on the Sample Receipt Checklist.

5. The Laboratory Control Sample (LCS) was within the method criteria.

6. A replicate analysis could not be performed due to insufficient sample volume.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory

9/29/08
Date

njp\i09-076

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

IL 9/30/08

**Inorganic Data Summary Report**
**Physical Testing Observation**

**Client:** WC-HANFORD RC-088 K1322
**LVL#:** 0809L076

**W.O.#:** 60049-001-001-0001-00
**Date Received:** 09-10-08

| **Analyte:** | **Observation:** |
|---|---|
| Ignitability | Samples J178L4, J178L6, J178L7, and J178L8 did not ignite.<br><br>The samples were heated to approximately 210°F.<br><br>p-Xylene was used to determined the accuracy of the ignitability apparatus. The p-Xylene will ignite at 81°F +/- 1°F. For this test, the p-Xylene ignited at 80°F. |

njp\i08-076.pt2

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/30/08

CLIENT: WC-HANFORD RC-088 K1322 LVL LOT #: 0809L076

WORK ORDER: 60049-001-001-0001-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -002 | J178L5 | IGNITABILITY | 201.000 | DEG F | 60.0 | |

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/30/08

CLIENT: WC-HANFORD RC-088 K1322 LVL LOT #: 0809L076

WORK ORDER: 60049-001-001-0001-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| BLANK10 | 08LFP029-MB1 | IGNITABILITY | 80.0 | 0.0 | 80.0 | 100 | 1.0 |

**Lionville Laboratory Incorporated**

**WET CHEMISTRY**

**METHODS GLOSSARY FOR SOIL/SOLIDS* SAMPLE ANALYSIS**

| | ASTM | SW846 | OTHER |
|---|---|---|---|
| % Ash | ___ D2216-80 | | |
| % Moisture | ___ D2216-80 | | ___ ILMO4.0 (e) |
| % Solids | ___ D2216-80 | | ___ ILMO4.0 (e) |
| % Volatile Solids | ___ D2216-80 | | |
| ASTM Extraction in Water | ___ D3987-81/85 | | |
| BTU | ___ D240-87 | | |
| CEC | | ___ 9081 | ___ c |
| Chromium VI | | ___ 3060A/7196A | |
| Corrosivity ___ by coupon ___ by pH | | ___ 1110(mod) ___ 9045C | |
| Cyanide, Total | | ___ 9010B | ___ ILMO4.0 (e) |
| Cyanide, Reactive | | ___ Section 7.3/9014 | |
| Halides, Extractable Organic | | ___ 9020B | ___ EPA 600/4/84-0( |
| Halides, Total | | ___ 9020B | ___ EPA 600/4/84-0( |
| EP Toxicity | | ___ 1310A | |
| Flash Point | | ___ 1010 | |
| Ignitability | | ✓ 1010 | |
| Oil & Grease | | ___ 9071A | |
| Carbon, Total Organic | | ___ 9060 | ___ Lloyd Kahn (mo |
| Oxygen Bomb Prep for Anions | ___ D240-87(mod) | ___ 5050 | |
| Petroleum Hydrocarbons, Total Recoverable | | ___ 9071 | ___ EPA 418.1 |
| pH, Soil | | ___ 9045C | |
| Sulfide, Reactive | | ___ Section 7.3/9030B | |
| Sulfide | | ___ 9030B(mod) | |
| Specific Gravity | ___ D1429-76C/ | ___ D5057-90 | |
| Sulfur, Total | | ___ 9056 | |
| Synthetic Preparation Leach | | ___ 1312 | |
| Paint Filter | | ___ 9095A | |

**Other:** **Method:**

**Other:** **Method**

* liquid samples

# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

## ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

## ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Laboratory Use Only: 0809L076

# Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: W. C. HANFORD SAF# RC-088

Est. Final Proj. Sampling Date:

Project#: 60049-001-001-0001-00

Project Contact/Phone#:

Lionville Laboratory Project Manager: O. JOHNSON

QC: SW846 Del: STD TAT: 7 days

Date Rec'd: 9-10-08 Date Due: 9-17-08

| | | A | | B |
|---|---|---|---|---|
| Refrigerator # | | 6 | | 3 |
| #/Type Container | Liquid | 1G | | 1G |
| | Solid | | | |
| Volume | | 60/40 | | 250 |
| Preservatives | | — | | — |

ANALYSES REQUESTED →

| ORGANIC | | | | INORG | | |
|---|---|---|---|---|---|---|
| VOA | BNA | Pest/PCB | Herb | ICP Metal Hg | CN | [illegible] |

Lionville Laboratory Use Only

MATRIX CODES: S- Soil; SE- Sediment; SO- Solid; SL- Sludge; W- Water; O- Oil; A- Air; DS- Drum Solids; DL- Drum Liquids; L- EP/TCLP Leachate; WI- Wipe; X- Other; F- Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | 06274 | 06254 | OPCB | | | | | Met① | | IIGN | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | J178L4 | | | OIL | 8-18-08 | 0900 | | X | X | | | | | X | | X | | | | | |
| 002 | 5 | | | | | 0915 | | X | X | | | | | X | | X | | | | | |
| 003 | 6 | | | | | 0940 | | X | X | | | | | X | | X | | | | | |
| 004 | 7 | | | | | 0950 | X | X | X | | | | | X | | X | | | | | |
| 005 | 8 | | | | | 1020 | X | X | X | | | | | X | | X | | | | | |
| ~~006~~ | ~~J178L40~~ | | | ~~OIL~~ | ~~8-18-08~~ | ~~0950~~ | | | | | | | | | | | | | | | |
| 007 | 41 | | | | | 1005 | | | | | | | | | | | | | | | |
| 008 | 42 | | | | | 1230 | | | | | | | | | | | | | | | |
| 009 | 43 | | | | | 1305 | | | | | | | | | | | | | | | |
| 010 | 44 | | | | | 1320 | | | | | | | | | | | | | | | |

Special Instructions: X=oil

Met①=HSL+Sn, Zn

Run Matrix QC

Special Instructions:

1.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Roadway | [illegible] | 9-9-08 | 1545 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |

| Relinquished | Received by | Date | Time |
|---|---|---|---|
| ORIGINAL REWRITTEN | | "COMPOSITE MATRIX" | |

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-088-062 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>B. Lawrence | Company Contact<br>Joan Kessner<br>Telephone No.<br>509-375-4688 | Project Coordinator<br>KESSNER, JH | Price Code<br>Data Turnaround<br>15 Days<br>7 Day by 9/10/08 |
| Project Designation<br>618-7 Burial Ground - Other | Sampling Location<br>618-7 Burial Ground (drums) | SAF No.<br>RC-088 | |
| Ice Chest No.<br>Hazmat Box | Field Logbook No.<br>EL-1395-13<br>COA<br>RG61878500 | Method of Shipment<br>Expedited Ground | |
| Shipped To<br>EBERLINE SERVICES LIONVILLE | Offsite Property No.<br>see HSMR | Bill of Lading/Air Bill No.<br>see HSMR | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radioactive contamination, potential beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | | | |
| Type of Container | aG | aG | aG | P | P | P | | | | | |
| No. of Container(s) | 1 | 1 | 0 | 0 | 0 | 1 | | | | | |
| Volume | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | | | |
| SAMPLE ANALYSIS | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. RTC 8/18/08 | | | | | PIN# |
| Sample No. / Matrix * / Sample Date / Sample Time | | | | | | | | | | | |
| ~~J178L4~~ NA 8/3/08 / OTHER / 8/18/08 / 0900 | | X | X | X | X | | | | | | 5901 |
| J178L5 / OTHER / " / 0915 | | X | X | X | X | | | | | | 5975 |
| J178L6 / OTHER / " / 0940 | | X | X | X | X | | | | | | 5954 |
| J178L7 / OTHER / " / 0950 | X | X | X | X | X | | | | | | 5952 |
| J178L8 / OTHER / 8/18/08 / 1020 | X | X | X | X | X | | | | | | 5777 |

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Blawrence | 8-19-08 1300 | R. Fahlberg R. Fahlberg | 8-19-08 1300 |
| R. Fahlberg R. Fahlberg | 8-19-08 1500 | RT COFFMAN / RT Coffman | 8/19/08 1500 |
| RT COFFMAN / RT Coffman RTC | 8-9/3/08 1215 | mstankovich | 9/3/08 1215 |
| mstankovich | 9/3/08 1215 | Ground | |
| RAD WAY | 9-9-08 1545 | | 9-9-08 1545 |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Arsenic, Lead, Selenium, Thallium, Tin, Zirconium}; Mercury - 7471 - (CV)

(2) Gross Alpha; Gross Beta; Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Uranium; Isotopic Thorium; Americium-241; Isotopic Plutonium; Strontium-89,90 -- Total Sr

Matrix *

S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
Va=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-088-062 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector<br>B. Lawrence | Company Contact<br>Joan Kessner<br>Telephone No.<br>509-375-4688 | Project Coordinator<br>KESSNER, JH | Price Code<<br>Data Turnaround<br>~~15~~ Days<br>7 days 9/10/08 |
| Project Designation<br>618-7 Burial Ground - Other | Sampling Location<br>618-7 Burial Ground (drums) | SAF No.<br>RC-088 | |
| Ice Chest No.<br>Haz Mat Box | Field Logbook No.<br>EL-1395-13<br>COA<br>RG61878500 | Method of Shipment<br>Expedited Ground | |
| Shipped To<br>EBERLINE SERVICES (LIONVILLE) | Offsite Property No.<br>see HSMR | Bill of Lading/Air Bill No.<br>see HSMR | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Potential Radioactive contamination, potential beryllium contamination*

**Special Handling and/or Storage**

*None*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | None | None | None | | | | | |
| Type of Container | aG | aG | aG | P | P | P | | | | | |
| No. of Container(s) | 1 | 1 | 0 | 0 | 0 | 1 | | | | | |
| Volume | 60mL | 250mL | 125mL | 125mL | 60mL | 500mL | | | | | |
| SAMPLE ANALYSIS | VOA - 8260A (TCL) | Semi-VOA - 8270A (TCL) | PCBs - 8082 | See item (1) in Special Instructions. | Ignitability - 1010 | See item (2) in Special Instructions. RTC 8/18/08 | | | | | PIN # |
| Sample No. / Matrix * / Sample Date / Sample Time | | | | | | | | | | | |
| J178L4 / OTHER / 8/18/08 / 0900 | | X | X | X | X | | | | | | 5901 |
| J178L5 / OTHER / " / 0915 | | X | X | X | X | | | | | | 5475 |
| J178L6 / OTHER / " / 0940 | | X | X | X | X | | | | | | 5954 |
| J178L7 / OTHER / " / 0950 | X | X | X | X | X | | | | | | 5952 |
| J178L8 / OTHER / 8/18/08 / 1020 | X | X | X | X | X | | | | | | 5777 |

| CHAIN OF POSSESSION | Sign/Print Names | Date/Time |
|---|---|---|
| Relinquished By/Removed From: B Lawrence | | 8-19-08 1300 |
| Received By/Stored In: R. Fahlberg R Fahlberg | | 8-19-08 1300 |
| Relinquished By/Removed From: R. Fahlberg R Fahlberg | | 8-19-08 1500 |
| Received By/Stored In: RTCoffman / RTCoffman | | 8/19/08 1500 |
| Relinquished By/Removed From: RTCoffman / RTCoffman | | 9/3/08 1215 |
| Received By/Stored In: M Stankovich | | 9/3/08 1215 |
| Relinquished By/Removed From: M Stankovich | | 9/3/08 1215 |
| Received By/Stored In: Ground | | |
| Relinquished By/Removed From: ROADWAY | | 9-9-08 1545 |
| Received By/Stored In: | | 9-9-08 1545 |
| Relinquished By/Removed From: | | |
| Received By/Stored In: | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Aluminum, Antimony, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}; ICP Metals - 6010A (Add-on) {Arsenic, Lead, Selenium, Thallium, Tin, Zirconium}; Mercury - 7471 - (CV)

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T=Tissue
Wi=Wipe
L=Liquid
Vg=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

WCH-EE-011

Lionville Laboratory Incorporated

# SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: W.C. Hanford

Project/SAP/SOW/Release #: RC-088

Date: 9/9/08

LvLI Batch #: 0809L076

Sample Custodian: [signature]

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| 1. Samples Hand Delivered or Shipped? | Carrier ROADWAY ~~FedEx~~ LK 9-10-08 | | Airbill # 868043436-4 ~~7905 7304 2908~~ LK 9-10-08 |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | ☐ Yes | ☐ No | ☑ No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| 4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| 5. Samples received cooled or ambient? | Temp 8.3 ~~8.4~~ | °C | Cooler # Box ~~ERC 11-056~~ LK 9-10-08 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify): |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☐ Yes | ☑ No | |
| 6. Custody seals on sample containers intact, signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| 7. COC (Client & LvLI) signed & dated? | ☑ Yes | ☐ No | |
| 8. Sample containers are intact? | ☑ Yes | ☐ No #001 Leaked into Bag | |
| 9. All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☐ Yes | ☐ No | |
| 10. All sample label information matches COC? | ☑ Yes | ☐ No | |
| 11. Samples properly preserved? (If #5 is no, then this is no.) | ☑ Yes | ☐ No | |
| 12. Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| 13. VOA, TOC, TOX free of headspace? | ☑ Yes | ☐ No | ☐ N/A |
| 14. QC stickers placed on bottles designated by client? | ☐ Yes | ☐ No | ☑ N/A |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☐ Yes | ☑ No | |
| 16. Project Manager contacted concerning any discrepancies? | ☑ Yes | ☐ No | ☐ N/A |
| Person Contacted D. JOHNSON | | Date 9-9-08 | |

LVLI