

**RECEIVED**  
APR 28 2003

**EDMC**

Lionville Laboratory, Inc.  
INORGANIC ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD B02-062 H1954

DATE RECEIVED: 11/07/02

LVL LOT # :0211L078

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J00859						
ARSENIC, TOTAL	001	S	02L0660	11/04/02	11/07/02	11/11/02
ARSENIC, TOTAL	001 REP	S	02L0660	11/04/02	11/07/02	11/11/02
ARSENIC, TOTAL	001 MS	S	02L0660	11/04/02	11/07/02	11/11/02
CHROMIUM, TOTAL	001	S	02L0660	11/04/02	11/07/02	11/11/02
CHROMIUM, TOTAL	001 REP	S	02L0660	11/04/02	11/07/02	11/11/02
CHROMIUM, TOTAL	001 MS	S	02L0660	11/04/02	11/07/02	11/11/02
MERCURY, TOTAL	001	S	02C0336	11/04/02	11/14/02	11/15/02
MERCURY, TOTAL	001 REP	S	02C0336	11/04/02	11/14/02	11/15/02
MERCURY, TOTAL	001 MS	S	02C0336	11/04/02	11/14/02	11/15/02
LEAD, TOTAL	001	S	02L0660	11/04/02	11/07/02	11/11/02
LEAD, TOTAL	001 REP	S	02L0660	11/04/02	11/07/02	11/11/02
LEAD, TOTAL	001 MS	S	02L0660	11/04/02	11/07/02	11/11/02
J00860						
ARSENIC, TOTAL	002	S	02L0660	11/04/02	11/07/02	11/11/02
CHROMIUM, TOTAL	002	S	02L0660	11/04/02	11/07/02	11/11/02
MERCURY, TOTAL	002	S	02C0336	11/04/02	11/14/02	11/15/02
LEAD, TOTAL	002	S	02L0660	11/04/02	11/07/02	11/11/02
J00861						
ARSENIC, TOTAL	003	S	02L0660	11/04/02	11/07/02	11/11/02
CHROMIUM, TOTAL	003	S	02L0660	11/04/02	11/07/02	11/11/02
MERCURY, TOTAL	003	S	02C0336	11/04/02	11/14/02	11/15/02
LEAD, TOTAL	003	S	02L0660	11/04/02	11/07/02	11/11/02
J00862						
ARSENIC, TOTAL	004	S	02L0660	11/04/02	11/07/02	11/11/02
CHROMIUM, TOTAL	004	S	02L0660	11/04/02	11/07/02	11/11/02
MERCURY, TOTAL	004	S	02C0336	11/04/02	11/14/02	11/15/02
LEAD, TOTAL	004	S	02L0660	11/04/02	11/07/02	11/11/02

LAB QC:

ARSENIC LABORATORY	LC1 BS	S	02L0660	N/A	11/07/02	11/13/02
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Lionville Laboratory, Inc.  
INORGANIC ANALYTICAL DATA PACKAGE FOR  
TNUHANFORD B02-062 H1954

DATE RECEIVED: 11/07/02

LVL LOT # :0211L078

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	MB1	S	02L0660	N/A	11/07/02	11/13/02
CHROMIUM LABORATORY	LC1 BS	S	02L0660	N/A	11/07/02	11/13/02
CHROMIUM, TOTAL	MB1	S	02L0660	N/A	11/07/02	11/13/02
MERCURY LABORATORY	LC1 BS	S	02C0336	N/A	11/14/02	11/15/02
MERCURY, TOTAL	MB1	S	02C0336	N/A	11/14/02	11/15/02
LEAD LABORATORY	LC1 BS	S	02L0660	N/A	11/07/02	11/13/02
LEAD, TOTAL	MB1	S	02L0660	N/A	11/07/02	11/13/02



## Analytical Report

**Client:** TNU-HANFORD B02-062  
**LVL#:** 0211L078  
**SDG/SAF#:** H1954/B02-062

**W.O.#:** 11343-606-001-9999-00  
**Date Received:** 11-07-02

### METALS CASE NARRATIVE

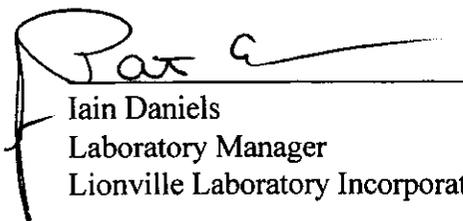
1. This narrative covers the analyses of 4 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. Please refer to the Sample Receipt Check List for sample discrepancies in LVL's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. The preparation/method blank for 1 analyte was outside method criteria. {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
  - a). The MB result for Chromium were greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and sample J00860 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 limits. Refer to the Inorganics Laboratory Control Standards Report.

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 14 pages.

10. The matrix spike (MS) recoveries for 3 analytes were 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 serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

<u>Sample ID</u>	<u>Element</u>	<u>PDS</u>	
		<u>Concentration (ppb)</u>	<u>% Recovery</u>
J00859	Chromium	200	103.2
	Lead	200	114.0

12. The duplicate analyses for 2 analytes were 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 Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
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 Incorporated  
 gmb/ml1-078

11-20-02  
 Date

# METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this

Lot#: 02116078

Leaching Procedure:   1310   1311   1312   Other:                   

CLP Metals    Digestion and    Analysis Methods:   ILM03.0   ILM04.0

Metals Digestion Methods:   3005A   3010A   3015   3020A 3050B   3051   200.7   SS17  
  Other:                   

## Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Antimony	<u>  </u> 6010B <u>  </u> 7041 <sup>5</sup>	<u>  </u> 200.7 <u>  </u> 204.2			<u>  </u> 99
Arsenic	<u>  </u> 6010B <u>  </u> 7060A <sup>5</sup>	<u>  </u> 200.7 <u>  </u> 206.2	<u>  </u> 3113B		<u>  </u> 99
Barium	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Beryllium	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Bismuth	<u>  </u> 6010B <sup>1</sup>	<u>  </u> 200.7 <sup>1</sup>		<u>  </u> 1620	<u>  </u> 99
Boron	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Cadmium	<u>  </u> 6010B <u>  </u> 7131A <sup>5</sup>	<u>  </u> 200.7 <u>  </u> 213.2			<u>  </u> 99
Calcium	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Chromium	<u>  </u> 6010B <u>  </u> 7191 <sup>5</sup>	<u>  </u> 200.7 <u>  </u> 218.2			<u>  </u> SS17
Cobalt	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Copper	<u>  </u> 6010B <u>  </u> 7211 <sup>5</sup>	<u>  </u> 200.7 <u>  </u> 220.2			<u>  </u> 99
Iron	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Lead	<u>  </u> 6010B <u>  </u> 7421 <sup>5</sup>	<u>  </u> 200.7 <u>  </u> 239.2	<u>  </u> 3113B		<u>  </u> 99
Lithium	<u>  </u> 6010B <u>  </u> 7430 <sup>4</sup>	<u>  </u> 200.7		<u>  </u> 1620	<u>  </u> 99
Magnesium	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Manganese	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Mercury	<u>  </u> 7470A <sup>3</sup> <u>  </u> 7471A <sup>3</sup>	<u>  </u> 245.1 <sup>2</sup> <u>  </u> 245.5 <sup>2</sup>			<u>  </u> 99
Molybdenum	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Nickel	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Potassium	<u>  </u> 6010B <u>  </u> 7610 <sup>4</sup>	<u>  </u> 200.7 <u>  </u> 258.1 <sup>4</sup>			<u>  </u> 99
Rare Earths	<u>  </u> 6010B <sup>1</sup>	<u>  </u> 200.7 <sup>1</sup>		<u>  </u> 1620	<u>  </u> 99
Selenium	<u>  </u> 6010B <u>  </u> 7740 <sup>5</sup>	<u>  </u> 200.7 <u>  </u> 270.2	<u>  </u> 3113B		<u>  </u> 99
Silicon	<u>  </u> 6010B <sup>1</sup>	<u>  </u> 200.7		<u>  </u> 1620	<u>  </u> 99
Silica	<u>  </u> 6010B	<u>  </u> 200.7		<u>  </u> 1620	<u>  </u> 99
Silver	<u>  </u> 6010B <u>  </u> 7761 <sup>5</sup>	<u>  </u> 200.7 <u>  </u> 272.2			<u>  </u> 99
Sodium	<u>  </u> 6010B <u>  </u> 7770 <sup>4</sup>	<u>  </u> 200.7 <u>  </u> 273.1 <sup>4</sup>			<u>  </u> 99
Strontium	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Thallium	<u>  </u> 6010B <u>  </u> 7841 <sup>5</sup>	<u>  </u> 200.7 <u>  </u> 279.2 <u>  </u> 200.9			<u>  </u> 99
Tin	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Titanium	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Uranium	<u>  </u> 6010B <sup>1</sup>	<u>  </u> 200.7 <sup>1</sup>		<u>  </u> 1620	<u>  </u> 99
Vanadium	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Zinc	<u>  </u> 6010B	<u>  </u> 200.7			<u>  </u> 99
Zirconium	<u>  </u> 6010B <sup>1</sup>	<u>  </u> 200.7 <sup>1</sup>		<u>  </u> 1620	<u>  </u> 99

Other:                   

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, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. 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, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
4. Flame AA.
5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/20/02

CLIENT: TNUHANFORD B02-062 H1954  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0211L078

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
-001	J00859	Arsenic, Total	8.4	MG/KG	0.32	1.0
		Chromium, Total	75.3	MG/KG	0.09	1.0
		Mercury, Total	0.36	MG/KG	0.02	1.0
		Lead, Total	117	MG/KG	0.20	1.0
-002	J00860	Arsenic, Total	1.9	MG/KG	0.37	1.0
		Chromium, Total	9.7	MG/KG	0.1	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	2.4	MG/KG	0.23	1.0
-003	J00861	Arsenic, Total	12.5	MG/KG	0.28	1.0
		Chromium, Total	533	MG/KG	0.07	1.0
		Mercury, Total	0.59	MG/KG	0.02	1.0
		Lead, Total	19.9	MG/KG	0.17	1.0
-004	J00862	Arsenic, Total	3.7	MG/KG	0.38	1.0
		Chromium, Total	90.1	MG/KG	0.10	1.0
		Mercury, Total	0.14	MG/KG	0.02	1.0
		Lead, Total	4.4	MG/KG	0.24	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/20/02

CLIENT: TNUHANFORD B02-062 H1954  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0211L078

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	02L0660-MB1	Arsenic, Total	0.69	MG/KG	0.38	1.0
		Chromium, Total	0.97	MG/KG	0.10	1.0
		Lead, Total	0.24 u	MG/KG	0.24	1.0
BLANK1	02C0336-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/20/02

CLIENT: TNUHANFORD B02-062 H1954  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0211L078

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J00859	Arsenic, Total	205	8.4	203	96.7	1.0
		Chromium, Total	117	75.3	20.3	206.4	1.0
		Mercury, Total	0.73	0.36	0.17	212.9	1.0
		Lead, Total	186	117	50.7	137.5	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/20/02

CLIENT: TNUHANFORD B02-062 H1954  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0211L078

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE RPD		
*****	*****	*****	*****	*****	*****	*****
-001REP	J00859	Arsenic, Total	8.4	9.1	8.0	1.0
		Chromium, Total	75.3	141	60.6	1.0
		Mercury, Total	0.36	0.34	8.3	1.0
		Lead, Total	117	173	38.6	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/20/02

CLIENT: TNUHANFORD B02-062 H1954  
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0211L078

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	02L0660-LC1	Arsenic, LCS	991	1000	MG/KG	99.1
		Chromium, LCS	52.6	50.0	MG/KG	105.2
		Lead, LCS	256	250	MG/KG	102.4
LCS1	02C0336-LC1	Mercury, LCS	2.3	2.5	MG/KG	94.6



Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B02-062-002		Page 1 of 1														
Collector MT Stankovich		Company Contact Mike Stankovich		Telephone No. 531-7620		Project Coordinator KESSNER, JH		Price Code <b>2E</b> Data Turnaround														
Project Designation 100 K Area - Quick Turn		Sampling Location 116-KW-3		SAF No. B02-062		Air Quality <input type="checkbox"/>		15 day														
Ice Chest No. ERC-02-1002		Field Logbook No.		COA R16KW32000		Method of Shipment Fed EX																
Shipped To TMA/RECRA <i>Dis 11/6/02</i>		Offsite Property No. <b>A030024</b>				Bill of Lading/Air Bill No. <b>8358 1726 5577</b>																
POSSIBLE SAMPLE HAZARDS/REMARKS <i>Radioactive</i>			Preservation		None	None	None	None														
			Type of Container		aG	Marinelli	aG	aG														
			No. of Container(s)		1	1	1	1														
			Volume		60mL	500mL	60mL	60mL														
SPECIAL HANDLING AND/OR STORAGE			See Item (1) in Special Instructions.		See Item (2) in Special Instructions.		Isotopic Uranium; Isotopic Plutonium;		Nickel-63; Strontium-89,90 - Total Sr; Carbon-14;													
SAMPLE ANALYSIS																						
Sample No.		Matrix *	Sample Date	Sample Time																		
J00859		SOIL	11-4-02	1010	✓																	
J00860		SOIL	11-4-02	1040	✓																	
J00861		SOIL	11-4-02	1045	✓																	
J00862		SOIL	11-4-02	1200	✓																	
CHAIN OF POSSESSION			Sign/Print Names				SPECIAL INSTRUCTIONS						Matrix *									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		(1) ICP Metals - 6010A (Supertrace) (Arsenic, Chromium, Lead); Mercury - 7471 - (CV) (2) Gamma Spectroscopy - Screen (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)  <i>m Stankovich not available to relinquish for shipment to lab on 11/6/02 @ 1245</i> <i>Dis 11/6/02</i>						S=Soil SS=Soil/Sediment SO=Soil SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Trace WP=Wipe L=Liquid V=Vegetation X=Other								
<i>M. Stankovich</i>		11-4-02 1515		<i>15/3728</i>		11-4-02 1515																
3728 Ref. 1B		11/6/02 1245		<i>David St. John</i>		11/6/02 1245																
<i>David St. John</i>		11/6/02 1245		<i>FED EX</i>																		
<i>FED EX</i>				<i>J. K...</i>		11/07/02 0930																
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																
LABORATORY SECTION		Received By		Title								Date/Time										
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By								Date/Time										

# LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: *TNU-Hanford*  
Purchase Order/Project: *N/A*

DATE: *11/07/02*

SAF# / SOW# / Release #: *B02-062*

Laboratory SDG #: *8211078*

**NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION**

- |  |  |  |   |  |
|--|--|--|---|--|
| 1. Custody seals on coolers or shipping container intact, signed and dated?  | <input checked="" type="checkbox"/> Yes                        | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #                     |
| 2. Outside of coolers or shipping containers are free from damage?   | <input checked="" type="checkbox"/> Yes                        | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #                     |
| 3. Airbill # recorded? <i>8358 1726 5577</i>   | <input checked="" type="checkbox"/> Yes                        | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #                     |
| 4. All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid) | <input checked="" type="checkbox"/> Yes                        | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #                     |
| 5. Sample containers are intact?   | <input checked="" type="checkbox"/> Yes                        | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #                     |
| 6. Custody seals on sample containers intact, signed and dated?  | <input checked="" type="checkbox"/> Yes                        | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #                     |
| 7. All samples on coc received?  | <input checked="" type="checkbox"/> Yes                        | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #                     |
| 8. All sample label information matches coc?   | <input checked="" type="checkbox"/> Yes                        | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #                     |
| 9. Laboratory QC samples designated on coc? (QC stickers placed on bottles?)   | <input type="checkbox"/> Yes                                   | <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment #                     |
| 10. Shipment meets LVLJ Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)  | <input checked="" type="checkbox"/> Yes<br><i>see 11/07/02</i> | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A            | <input checked="" type="checkbox"/> see Comment # <i>1</i> |
| 11. Where applicable, bar code labels are affixed to coc?  | <input type="checkbox"/> Yes                                   | <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment #                     |
| 12. coc signed and dated?  | <input checked="" type="checkbox"/> Yes                        | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #                     |
| 13. coc will be faxed or emailed to client?  | <input checked="" type="checkbox"/> Yes                        | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | <input type="checkbox"/> see Comment #                     |
| 14. Project Manager/Client contacted concerning discrepancies? (name/date)   | <input type="checkbox"/> Yes                                   | <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> see Comment #                     |

Cooler # / temp (°C) and Comments:

*① ERC-02-1002*  
*14.1°C*  
*- WARM -*

Laboratory Sample Custodian: *JPM* *11/07/02* *0930*

Laboratory Project Manager:



# EBERLINE

SERVICES

November 22, 2002

Ms. Joan Kessner  
Bechtel Hanford Inc.  
3350 George Washington Way  
Richland, WA 99352  
MSIN: H0-25

Reference: **P.O. #630**  
**Eberline Services R2-11-016-7382, SDG H1954**

Dear Ms. Kessner:

Enclosed is the data report for four solid samples designated under SAF No. B02-062 received at Eberline Services on November 7, 2002. The samples were analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion  
Program Manager

MCM

Enclosure: *Data Package*



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

**1.0 GENERAL**

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1954 was composed of four solid (soil) samples designated under SAF No. B02-062 with a Project Designation of: 100 K Area – Quick Turn.

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

**2.0 ANALYSIS NOTES**

**2.1 Carbon-14 Analyses**

No problems were encountered during the course of the analyses.

**2.2 Nickel-63 Analyses**

No problems were encountered during the course of the analyses.

**2.3 Total Strontium Analyses**

No problems were encountered during the course of the analyses.

**2.4 Isotopic Uranium Analyses**

No problems were encountered during the course of the analyses.

**2.5 Isotopic Plutonium Analyses**

No problems were encountered during the course of the analyses.

**2.6 Gamma Screen Analyses**

No problems were encountered during the course of the analyses.

**Case Narrative Certification Statement**

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

  
\_\_\_\_\_  
**Melissa C. Mannion**  
Program Manager

11/22/02  
Date

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H1954

SDG 7382  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Case no SDG\_H1954

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

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Melissa Mannion  
Prepared by

Melissa Mannion  
Reviewed by

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 11/22/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1954

SDG 7382  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H1954

ABOUT THE DATA SUMMARY SECTION

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

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

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

PREPARATION BATCH SUMMARY

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

WORK SUMMARY

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

METHOD BLANKS

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

LAB CONTROL SAMPLES

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

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 1

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
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Version 3.06  
Report date 11/22/02

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H1954

SDG 7382  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG\_H1954

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

REPORT GUIDES

Page 2

SUMMARY DATA SECTION

Page 2

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/22/02

**EBERLINE SERVICES/RICHMOND**  
**SAMPLE DELIVERY GROUP H1954**

SDG 7382  
 Contact Melissa C. Mannion

**SAMPLE SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG H1954

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
J00859	116-KW-3	SOLID		R211016-01	B02-062	B02-062-002	11/04/02 10:10
J00860	116-KW-3	SOLID		R211016-02	B02-062	B02-062-002	11/04/02 10:40
J00861	116-KW-3	SOLID		R211016-03	B02-062	B02-062-002	11/04/02 10:45
J00862	116-KW-3	SOLID		R211016-04	B02-062	B02-062-002	11/04/02 12:00
Method Blank		SOLID		R211016-06	B02-062		
Lab Control Sample		SOLID		R211016-05	B02-062		
Duplicate (R211016-03)	116-KW-3	SOLID		R211016-07	B02-062		11/04/02 10:45

SAMPLE SUMMARY

Page 1

SUMMARY DATA SECTION

Page 3

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-CS  
 Version 3.06  
 Report date 11/22/02

**EBERLINE SERVICES/RICHMOND**  
**SAMPLE DELIVERY GROUP H1954**

SDG 7382  
 Contact Melissa C. Mannion

**QC SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG H1954

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7382	B02-062-002	J00859	SOLID	96.6	880.9 g		11/07/02	3	R211016-01	7382-001
		J00860	SOLID	97.3	887.0 g		11/07/02	3	R211016-02	7382-002
		J00861	SOLID	97.0	969.5 g		11/07/02	3	R211016-03	7382-003
		J00862	SOLID	96.2	1010 g		11/07/02	3	R211016-04	7382-004
		Method Blank	SOLID						R211016-06	7382-006
		Lab Control Sample	SOLID						R211016-05	7382-005
		Duplicate (R211016-03)	SOLID	97.0	969.5 g		11/07/02	3	R211016-07	7382-007

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-QS  
 Version 3.06  
 Report date 11/22/02

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H1954

SDG 7382  
 Contact Melissa C. Mannion

**PREP BATCH SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG H1954

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED			QUALI-	
			BATCH	2σ %	CLIENT	MORE	RE		BLANK
<b>Alpha Spectroscopy</b>									
PU	SOLID	Plutonium, Isotopic in Solids	7052-014	5.0	4		1	1	1/1
U	SOLID	Uranium, Isotopic in Soil	7052-014	5.0	4		1	1	1/1
<b>Beta Counting</b>									
SR	SOLID	Total Strontium in Soil	7052-014	10.0	4		1	1	1/1
<b>Gamma Spectroscopy</b>									
GAM	SOLID	Gamma Scan	7052-014	15.0	4		1		
<b>Liquid Scintillation Counting</b>									
C	SOLID	Carbon 14 in Soil	7052-014	10.0	4		1	1	1/1
NI_L	SOLID	Nickel 63 in Soil	7052-014	10.0	4		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 Hanford  
 Version Ver 1.0  
 Form DVD-PBS  
 Version 3.06  
 Report date 11/22/02

**EBERLINE SERVICES/RICHMOND**  
**SAMPLE DELIVERY GROUP H1954**

SDG 7382  
 Contact Melissa C. Mannion

**WORK SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG H1954

CLIENT SAMPLE ID	LOCATION	MATRIX	LAB SAMPLE ID	COLLECTED	SUF-	ANALYZED	REVIEWED	BY	METHOD
CUSTODY	SAF No		RECEIVED	PLANCHET	TEST	FIX			
J00859			R211016-01	7382-001	C	11/15/02	11/22/02	MCM	Carbon 14 in Soil
116-KW-3		SOLID	11/04/02	7382-001	GAM	11/15/02	11/22/02	MCM	Gamma Scan
B02-062-002	B02-062		11/07/02	7382-001	NI_L	11/20/02	11/22/02	MCM	Nickel 63 in Soil
				7382-001	PU	11/21/02	11/22/02	MCM	Plutonium, Isotopic in Solids
				7382-001	SR	11/18/02	11/22/02	MCM	Total Strontium in Soil
				7382-001	U	11/21/02	11/22/02	MCM	Uranium, Isotopic in Soil
J00860			R211016-02	7382-002	C	11/15/02	11/22/02	MCM	Carbon 14 in Soil
116-KW-3		SOLID	11/04/02	7382-002	GAM	11/15/02	11/22/02	MCM	Gamma Scan
B02-062-002	B02-062		11/07/02	7382-002	NI_L	11/20/02	11/22/02	MCM	Nickel 63 in Soil
				7382-002	PU	11/21/02	11/22/02	MCM	Plutonium, Isotopic in Solids
				7382-002	SR	11/18/02	11/22/02	MCM	Total Strontium in Soil
				7382-002	U	11/20/02	11/22/02	MCM	Uranium, Isotopic in Soil
J00861			R211016-03	7382-003	C	11/15/02	11/22/02	MCM	Carbon 14 in Soil
116-KW-3		SOLID	11/04/02	7382-003	GAM	11/15/02	11/22/02	MCM	Gamma Scan
B02-062-002	B02-062		11/07/02	7382-003	NI_L	11/20/02	11/22/02	MCM	Nickel 63 in Soil
				7382-003	PU	11/21/02	11/22/02	MCM	Plutonium, Isotopic in Solids
				7382-003	SR	11/18/02	11/22/02	MCM	Total Strontium in Soil
				7382-003	U	11/19/02	11/22/02	MCM	Uranium, Isotopic in Soil
J00862			R211016-04	7382-004	C	11/15/02	11/22/02	MCM	Carbon 14 in Soil
116-KW-3		SOLID	11/04/02	7382-004	GAM	11/15/02	11/22/02	MCM	Gamma Scan
B02-062-002	B02-062		11/07/02	7382-004	NI_L	11/20/02	11/22/02	MCM	Nickel 63 in Soil
				7382-004	PU	11/21/02	11/22/02	MCM	Plutonium, Isotopic in Solids
				7382-004	SR	11/18/02	11/22/02	MCM	Total Strontium in Soil
				7382-004	U	11/19/02	11/22/02	MCM	Uranium, Isotopic in Soil
Method Blank			R211016-06	7382-006	C	11/15/02	11/22/02	MCM	Carbon 14 in Soil
		SOLID		7382-006	GAM	11/15/02	11/22/02	MCM	Gamma Scan
	B02-062			7382-006	NI_L	11/20/02	11/22/02	MCM	Nickel 63 in Soil
				7382-006	PU	11/21/02	11/22/02	MCM	Plutonium, Isotopic in Solids
				7382-006	SR	11/18/02	11/22/02	MCM	Total Strontium in Soil
				7382-006	U	11/20/02	11/22/02	MCM	Uranium, Isotopic in Soil

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-CWS  
 Version 3.06  
 Report date 11/22/02

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H1954

SDG 7382  
Contact Melissa C. Mannion

**WORK SUMMARY, cont.**

Client Hanford  
Contract No. 630  
Case no SDG H1954

CLIENT SAMPLE ID	LAB SAMPLE ID									
LOCATION	MATRIX	COLLECTED	PLANCHET	TEST	SUF-	ANALYZED	REVIEWED	BY	METHOD	
CUSTODY	SAF No	RECEIVED			FIX					
Lab Control Sample		R211016-05	7382-005	C		11/15/02	11/22/02	MCM	Carbon 14 in Soil	
	SOLID		7382-005	NI_L		11/20/02	11/22/02	MCM	Nickel 63 in Soil	
	B02-062		7382-005	PU		11/21/02	11/22/02	MCM	Plutonium, Isotopic in Solids	
			7382-005	SR		11/18/02	11/22/02	MCM	Total Strontium in Soil	
			7382-005	U		11/21/02	11/22/02	MCM	Uranium, Isotopic in Soil	
Duplicate (R211016-03)		R211016-07	7382-007	C		11/15/02	11/22/02	MCM	Carbon 14 in Soil	
116-KW-3	SOLID	11/04/02	7382-007	NI_L		11/20/02	11/22/02	MCM	Nickel 63 in Soil	
	B02-062	11/07/02	7382-007	PU		11/21/02	11/22/02	MCM	Plutonium, Isotopic in Solids	
			7382-007	SR		11/18/02	11/22/02	MCM	Total Strontium in Soil	
			7382-007	U		11/19/02	11/22/02	MCM	Uranium, Isotopic in Soil	

COUNTS OF TESTS BY SAMPLE TYPE												
TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL	
C	B02-062	Carbon 14 in Soil	C14_COX_LSC	4			1	1	1		7	
GAM	B02-062	Gamma Scan	GAMMA_GS	4			1				5	
NI_L	B02-062	Nickel 63 in Soil	NI63_LSC	4			1	1	1		7	
PU	B02-062	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	4			1	1	1		7	
SR	B02-062	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	4			1	1	1		7	
U	B02-062	Uranium, Isotopic in Soil	UIISO_PLATE_AEA	4			1	1	1		7	
<b>TOTALS</b>				<b>24</b>			<b>6</b>	<b>5</b>	<b>5</b>		<b>40</b>	

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-CWS  
Version 3.06  
Report date 11/22/02

**EBERLINE SERVICES / RICHMOND**

SAMPLE DELIVERY GROUP H1954

R211016-06

Method Blank

**METHOD BLANK**

SDG <u>7382</u>	Client/Case no <u>Hanford</u>	SDG <u>H1954</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R211016-06</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7382-006</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B02-062</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Carbon 14	14762-75-5	1.68	2.6	4.3	50	U	C
Nickel 63	13981-37-8	-0.058	1.0	1.8	30	U	NI_L
Total Strontium	SR-RAD	0.069	0.16	0.32	1.0	U	SR
Uranium 233/234	U-233/234	-0.024	0.048	0.18	1.0	U	U
Uranium 235	15117-96-1	0	0.058	0.22	1.0	U	U
Uranium 238	U-238	0	0.048	0.18	1.0	U	U
Plutonium 238	13981-16-3	0	0.075	0.29	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.038	0.075	0.29	1.0	U	PU
Cobalt 60	10198-40-0	U		0.026	0.050	U	GAM
Cesium 137	10045-97-3	U		0.025	0.10	U	GAM
Europium 152	14683-23-9	U		0.054	0.10	U	GAM
Europium 154	15585-10-1	U		0.087	0.10	U	GAM
Europium 155	14391-16-3	U		0.072	0.10	U	GAM
Americium 241	14596-10-2	U		0.12		U	GAM

100 K Area - Quick Turn

QC-BLANK 43133
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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>11/22/02</u>

**EBERLINE SERVICES/RICHMOND**  
**SAMPLE DELIVERY GROUP H1954**

R211016-05

Lab Control Sample

**LAB CONTROL SAMPLE**

SDG <u>7382</u> Contact <u>Melissa C. Mannion</u>  Lab sample id <u>R211016-05</u> Dept sample id <u>7382-005</u>	Client/Case no <u>Hanford</u> <u>SDG H1954</u> Case no <u>No. 630</u>  Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>B02-062</u>
---	---

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Carbon 14	2260	23	5.9	50	C	2490	100	91	85-115	80-120
Nickel 63	215	4.2	1.7	30	NI_L	230	9.2	93	84-116	80-120
Total Strontium	22.6	0.89	0.26	1.0	SR	21.3	0.85	106	82-118	80-120
Uranium 233/234	17.3	1.7	0.85	1.0	U	18.6	0.74	93	84-116	80-120
Uranium 235	14.2	1.5	0.21	1.0	U	15.1	0.60	94	82-118	80-120
Uranium 238	19.8	1.9	0.82	1.0	U	20.2	0.81	98	83-117	80-120
Plutonium 238	23.8	2.6	0.25	1.0	PU	24.4	0.98	98	81-119	80-120
Plutonium 239/240	26.9	2.9	0.25	1.0	PU	26.4	1.1	102	81-119	80-120

100 K Area - Quick Turn

QC-LCS 43132

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LCS  
 Version 3.06  
 Report date 11/22/02

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1954

R211016-07

J00861

DUPLICATE

SDG <u>7382</u>	Client/Case no <u>Hanford</u>	SDG <u>H1954</u>
Contact <u>Melissa C. Mannion</u>	Case no <u>No. 630</u>	
<b>DUPLICATE</b>	<b>ORIGINAL</b>	
Lab sample id <u>R211016-07</u>	Lab sample id <u>R211016-03</u>	Client sample id <u>J00861</u>
Dept sample id <u>7382-007</u>	Dept sample id <u>7382-003</u>	Location/Matrix <u>116-KW-3</u> <b>SOLID</b>
	Received <u>11/07/02</u>	Collected/Weight <u>11/04/02 10:45</u> <u>969.5 g</u>
% solids <u>97.0</u>	% solids <u>97.0</u>	Custody/SAF No <u>B02-062-002</u> <u>B02-062</u>

ANALYTE	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 PROT TOT LIMIT
Carbon 14	1.30	2.4	4.0	50	U	C	0.594	2.3	3.9	U	-	
Nickel 63	1540	16	2.7	30		NI_L	1490	15	2.9		3	21
Total Strontium	0.428	0.16	0.24	1.0	J	SR	0.630	0.17	0.22	J	38	70
Uranium 233/234	1.03	0.31	0.16	1.0	U	U	0.571	0.22	0.17	J	57	72
Uranium 235	0.078	0.10	0.20	1.0	U	U	0.053	0.053	0.20	U	-	
Uranium 238	0.796	0.26	0.16	1.0	J	U	0.637	0.22	0.17	J	22	72
Plutonium 238	0	0.069	0.26	1.0	U	PU	0.038	0.076	0.29	U	-	
Plutonium 239/240	0.588	0.28	0.26	1.0	J	PU	0.644	0.31	0.29	J	9	102

100 K Area - Quick Turn

QC-DUP#3 43134

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>11/22/02</u>

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H1954

R211016-01

J00859

DATA SHEET

SDG <u>7382</u>	Client/Case no <u>Hanford</u>	SDG <u>H1954</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R211016-01</u>	Client sample id <u>J00859</u>	
Dept sample id <u>7382-001</u>	Location/Matrix <u>116-KW-3</u>	<u>SOLID</u>
Received <u>11/07/02</u>	Collected/Weight <u>11/04/02 10:10</u>	<u>880.9 g</u>
% solids <u>96.6</u>	Custody/SAF No <u>B02-062-002</u>	<u>B02-062</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Carbon 14	14762-75-5	1.05	2.1	3.5	50	U	C
Nickel 63	13981-37-8	9.51	1.5	2.0	30	J	NI_L
Total Strontium	SR-RAD	0.119	0.12	0.22	1.0	U	SR
Uranium 233/234	U-233/234	0.534	0.24	0.18	1.0	J	U
Uranium 235	15117-96-1	0.056	0.056	0.22	1.0	U	U
Uranium 238	U-238	0.790	0.28	0.18	1.0	J	U
Plutonium 238	13981-16-3	0	0.092	0.35	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.092	0.35	1.0	U	PU
Cobalt 60	10198-40-0	0.585	0.10	<u>0.082</u>	0.050		GAM
Cesium 137	10045-97-3	3.11	0.20	<u>0.17</u>	0.10		GAM
Europium 152	14683-23-9	11.6	0.40	<u>0.32</u>	0.10		GAM
Europium 154	15585-10-1	1.65	0.42	<u>0.34</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>0.23</u>	0.10	U	GAM
Americium 241	14596-10-2	U		0.12		U	GAM

100 K Area - Quick Turn

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>11/22/02</u>

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H1954

R211016-02

J00860

DATA SHEET

SDG <u>7382</u>	Client/Case no <u>Hanford</u>	SDG <u>H1954</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R211016-02</u>	Client sample id <u>J00860</u>	
Dept sample id <u>7382-002</u>	Location/Matrix <u>116-KW-3</u>	<u>SOLID</u>
Received <u>11/07/02</u>	Collected/Weight <u>11/04/02 10:40</u>	<u>887.0 g</u>
% solids <u>97.3</u>	Custody/SAF No <u>B02-062-002</u>	<u>B02-062</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Carbon 14	14762-75-5	0.534	2.1	3.5	50	U	C
Nickel 63	13981-37-8	0.517	1.1	1.9	30	U	NI_L
Total Strontium	SR-RAD	0.116	0.14	0.25	1.0	U	SR
Uranium 233/234	U-233/234	0.351	0.24	0.22	1.0	J	U
Uranium 235	15117-96-1	0	0.071	0.27	1.0	U	U
Uranium 238	U-238	0.322	0.18	0.22	1.0	J	U
Plutonium 238	13981-16-3	0	0.056	0.22	1.0	U	PU
Plutonium 239/240	PU-239/240	0.028	0.056	0.22	1.0	U	PU
Cobalt 60	10198-40-0	U		0.042	0.050	U	GAM
Cesium 137	10045-97-3	0.048	0.037	0.040	0.10	J	GAM
Europium 152	14683-23-9	U		0.086	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.12</u>	0.10	U	GAM
Europium 155	14391-16-3	U		0.075	0.10	U	GAM
Americium 241	14596-10-2	U		0.047		U	GAM

100 K Area - Quick Turn

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
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**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP H1954**

R211016-03

J00861

**DATA SHEET**

SDG <u>7382</u>	Client/Case no <u>Hanford</u>	SDG <u>H1954</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R211016-03</u>	Client sample id <u>J00861</u>	
Dept sample id <u>7382-003</u>	Location/Matrix <u>116-KW-3</u>	<u>SOLID</u>
Received <u>11/07/02</u>	Collected/Weight <u>11/04/02 10:45</u>	<u>969.5 g</u>
% solids <u>97.0</u>	Custody/SAF No <u>B02-062-002</u>	<u>B02-062</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Carbon 14	14762-75-5	0.594	2.3	3.9	50	U	C
Nickel 63	13981-37-8	1490	15	2.9	30		NI_L
Total Strontium	SR-RAD	0.630	0.17	0.22	1.0	J	SR
Uranium 233/234	U-233/234	0.571	0.22	0.17	1.0	J	U
Uranium 235	15117-96-1	0.053	0.053	0.20	1.0	U	U
Uranium 238	U-238	0.637	0.22	0.17	1.0	J	U
Plutonium 238	13981-16-3	0.038	0.076	0.29	1.0	U	PU
Plutonium 239/240	PU-239/240	0.644	0.31	0.29	1.0	J	PU
Cobalt 60	10198-40-0	21.0	0.61	<u>0.49</u>	0.050		GAM
Cesium 137	10045-97-3	0.731	0.45	<u>0.66</u>	0.10		GAM
Europium 152	14683-23-9	408	2.7	<u>2.2</u>	0.10		GAM
Europium 154	15585-10-1	50.4	2.0	<u>1.8</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>2.3</u>	0.10	U	GAM
Americium 241	14596-10-2	U		1.8		U	GAM

100 K Area - Quick Turn

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>11/22/02</u>

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H1954

R211016-04

J00862

DATA SHEET

SDG <u>7382</u>	Client/Case no <u>Hanford</u>	SDG <u>H1954</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R211016-04</u>	Client sample id <u>J00862</u>	
Dept sample id <u>7382-004</u>	Location/Matrix <u>116-KW-3</u>	<u>SOLID</u>
Received <u>11/07/02</u>	Collected/Weight <u>11/04/02 12:00</u>	<u>1010 g</u>
% solids <u>96.2</u>	Custody/SAF No <u>B02-062-002</u>	<u>B02-062</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Carbon 14	14762-75-5	1.20	2.2	3.7	50	U	C
Nickel 63	13981-37-8	213	4.5	2.0	30		NI_L
Total Strontium	SR-RAD	0.229	0.14	0.24	1.0	U	SR
Uranium 233/234	U-233/234	0.493	0.21	0.16	1.0	J	U
Uranium 235	15117-96-1	0	0.050	0.19	1.0	U	U
Uranium 238	U-238	0.432	0.21	0.16	1.0	J	U
Plutonium 238	13981-16-3	0.030	0.060	0.23	1.0	U	PU
Plutonium 239/240	PU-239/240	0.090	0.12	0.23	1.0	U	PU
Cobalt 60	10198-40-0	9.81	0.21	<u>0.12</u>	0.050		GAM
Cesium 137	10045-97-3	1.04	0.15	<u>0.18</u>	0.10		GAM
Europium 152	14683-23-9	47.1	0.62	<u>0.49</u>	0.10		GAM
Europium 154	15585-10-1	8.73	0.50	<u>0.40</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>0.94</u>	0.10	U	GAM
Americium 241	14596-10-2	U		0.46		U	GAM

100 K Area - Quick Turn

Lab id <u>EBERLINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H1954

**METHOD SUMMARY**  
 PLUTONIUM, ISOTOPIC IN SOLIDS  
 ALPHA SPECTROSCOPY

Test PU Matrix SOLID  
 SDG 7382  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 630  
 Contract SDG H1954

**RESULTS**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 7052-014						
J00859	R211016-01			7382-001	U	U
J00860	R211016-02			7382-002	U	U
J00861	R211016-03			7382-003	U	0.644 J
J00862	R211016-04			7382-004	U	U
BLK (QC ID=43133)	R211016-06			7382-006	U	U
LCS (QC ID=43132)	R211016-05			7382-005	ok	ok
Duplicate (R211016-03)	R211016-07			7382-007	- U	ok J

Nominal values and limits from method RDLs (pCi/g) 1.0 1.0  
 100 K Area - Quick Turn

**METHOD PERFORMANCE**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 7052-014 2σ prep error 5.0 % Reference Lab Notebook 7052 pg. 014															
J00859	R211016-01			0.35	0.500			59		107			17	11/21/02	11/21 SS-061
J00860	R211016-02			0.22	0.500			97		107			17	11/21/02	11/21 SS-062
J00861	R211016-03			0.29	0.500			82		107			17	11/21/02	11/21 SS-063
J00862	R211016-04			0.23	0.500			92		107			17	11/21/02	11/21 SS-065
BLK (QC ID=43133)	R211016-06			0.29	0.500			67		116				11/21/02	11/21 SS-033
LCS (QC ID=43132)	R211016-05			0.25	0.500			82		115				11/21/02	11/21 SS-011
Duplicate (R211016-03)	R211016-07			0.26	0.500			72		116			17	11/21/02	11/21 SS-042
	(QC ID=43134)														

Nominal values and limits from method 1.0 0.500 20-105 100 100 180

METHOD SUMMARIES

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EBERLINE SERVICES/RICHMOND  
SAMPLE DELIVERY GROUP H1954

Test PU Matrix SOLID  
SDG 7382  
Contact Melissa C. Mannion

METHOD SUMMARY, cont.  
PLUTONIUM, ISOTOPIC IN SOLIDS  
ALPHA SPECTROSCOPY

Client Hanford  
Contract No. 630  
Contract SDG H1954

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-060	Soil Preparation, rev 4
	CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES $\pm$ 2 SD	MDA <u>0.27</u> $\pm$ <u>0.089</u>
FOR 7 SAMPLES	YIELD <u>79</u> $\pm$ <u>27</u>

METHOD SUMMARIES

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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H1954

Test U Matrix SOLID  
 SDG 7382  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 630  
 Contract SDG H1954

**METHOD SUMMARY**

URANIUM, ISOTOPIC IN SOIL  
 ALPHA SPECTROSCOPY

**RESULTS**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	PLANCHET	1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)			
				233/234	235	238	1÷3	2σ	2÷3	2σ
Preparation batch 7052-014										
J00859	R211016-01		7382-001	0.534 J	U	0.790 J	68	39	7	8
J00860	R211016-02		7382-002	0.351 J	U	0.322 J	109	96	0	22
J00861	R211016-03		7382-003	0.571 J	U	0.637 J	90	46	8	9
J00862	R211016-04		7382-004	0.493 J	U	0.432 J	114	74	0	12
BLK (QC ID=43133)	R211016-06		7382-006	U	U	U				
LCS (QC ID=43132)	R211016-05		7382-005	ok	ok	ok				
Duplicate (R211016-03)	R211016-07		7382-007	ok	- U	ok J	129	57	10	13
Nominal values and limits from method			RDLs (pCi/g)	1.0	1.0	1.0	100		4	
100 K Area - Quick Turn							Averages 102		5	

**METHOD PERFORMANCE**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	MAX MDA pCi/g	ALIQUOT g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL-			
													PREPARED	YZED	DETECTOR	
Preparation batch 7052-014													2σ prep error 5.0 %		Reference Lab Notebook 7052 pg. 014	
J00859	R211016-01		0.22	0.500			100	120	17	11/15/02	11/21	SS-003				
J00860	R211016-02		0.27	0.500			79	121	16	11/15/02	11/20	SS-003				
J00861	R211016-03		0.20	0.500			93	137	15	11/15/02	11/19	SS-003				
J00862	R211016-04		0.19	0.500			101	138	15	11/15/02	11/19	SS-006				
BLK (QC ID=43133)	R211016-06		0.22	0.500			98	122		11/15/02	11/20	SS-006				
LCS (QC ID=43132)	R211016-05		0.85	0.500			102	126		11/15/02	11/21	SS-006				
Duplicate (R211016-03)	R211016-07		0.20	0.500			93	139	15	11/15/02	11/19	SS-048				
(QC ID=43134)																
Nominal values and limits from method			1.0	0.500			20-105	100	100	180						

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1954

METHOD SUMMARY, cont.

URANIUM, ISOTOPIC IN SOIL  
ALPHA SPECTROSCOPY

Test U Matrix SOLID  
SDG 7382  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Contract SDG H1954

PROCEDURES	REFERENCE	UIISO_PLATE_AEA
	CP-060	Soil Preparation, rev 4
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-911	Uranium in Water and Dissolved Sample by Extraction Chromatography, rev 4
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD	MDA	<u>0.31</u> ± <u>0.48</u>
FOR 7 SAMPLES	YIELD	<u>95</u> ± <u>16</u>

METHOD SUMMARIES

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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H1954

Test SR Matrix SOLID  
 SDG 7382  
 Contact Melissa C. Mannion

**METHOD SUMMARY**  
 TOTAL STRONTIUM IN SOIL  
 BETA COUNTING

Client Hanford  
 Contract No. 630  
 Contract SDG H1954

**RESULTS**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Total Strontium
Preparation batch 7052-014					
J00859	R211016-01			7382-001	U
J00860	R211016-02			7382-002	U
J00861	R211016-03			7382-003	0.630 J
J00862	R211016-04			7382-004	U
BLK (QC ID=43133)	R211016-06			7382-006	U
LCS (QC ID=43132)	R211016-05			7382-005	ok
Duplicate (R211016-03)	R211016-07			7382-007	ok J

Nominal values and limits from method RDLs (pCi/g) 1.0  
 100 K Area - Quick Turn

**METHOD PERFORMANCE**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 7052-014 2σ prep error 10.0 % Reference Lab Notebook 7052 pg. 014															
J00859	R211016-01			0.22	1.00			94	100				14	11/18/02	11/18 GRB-217
J00860	R211016-02			0.25	1.00			92	100				14	11/18/02	11/18 GRB-202
J00861	R211016-03			0.22	1.00			91	100				14	11/18/02	11/18 GRB-218
J00862	R211016-04			0.24	1.00			90	100				14	11/18/02	11/18 GRB-219
BLK (QC ID=43133)	R211016-06			0.32	1.00			77	100					11/18/02	11/18 GRB-206
LCS (QC ID=43132)	R211016-05			0.26	1.00			77	100					11/18/02	11/18 GRB-220
Duplicate (R211016-03)	R211016-07			0.24	1.00			90	100				14	11/18/02	11/18 GRB-221
	(QC ID=43134)														

Nominal values and limits from method 1.0 1.00 30-105 100 180

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
CP-060	Soil Preparation, rev 4	
CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2	
CP-502	Strontium in Solids, rev 6	

AVERAGES ± 2 SD	MDA <u>0.25</u> ± <u>0.068</u>
FOR 7 SAMPLES	YIELD <u>87</u> ± <u>14</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H1954

Test GAM Matrix SOLID  
 SDG 7382  
 Contact Melissa C. Mannion

**METHOD SUMMARY**

GAMMA SCAN  
 GAMMA SPECTROSCOPY

Client Hanford  
 Contract No. 630  
 Contract SDG\_H1954

**RESULTS**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 7052-014						
J00859	R211016-01	7382-001			0.585	3.11
J00860	R211016-02	7382-002			U	0.048 J
J00861	R211016-03	7382-003			21.0	0.731
J00862	R211016-04	7382-004			9.81	1.04
BLK (QC ID=43133)	R211016-06	7382-006			U	U

Nominal values and limits from method      RDLs (pCi/g)      0.050      0.10  
 100 K Area - Quick Turn

**METHOD PERFORMANCE**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 7052-014      2σ prep error 15.0 % Reference Lab Notebook 7052 pg. 014															
J00859	R211016-01			<u>0.082</u>	680					<u>78</u>			11	11/14/02	11/15 02,01,00
J00860	R211016-02			0.042	702					<u>79</u>			11	11/14/02	11/15 MB,07,00
J00861	R211016-03			<u>0.49</u>	791					<u>75</u>			11	11/14/02	11/15 02,03,00
J00862	R211016-04			<u>0.12</u>	822					<u>78</u>			11	11/14/02	11/15 02,04,00
BLK (QC ID=43133)	R211016-06			0.026	680					<u>78</u>				11/14/02	11/15 MB,05,00

Nominal values and limits from method      0.050 680      100      180

PROCEDURES    REFERENCE    GAMMA\_GS  
 CP-060        Soil Preparation, rev 4  
 CP-100        Ge(Li) Preparation for Commercial Samples, rev 5

AVERAGES ± 2 SD      MDA 0.15 ± 0.38  
 FOR 5 SAMPLES        YIELD \_\_\_\_\_ ± \_\_\_\_\_

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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H1954

Test C Matrix SOLID  
 SDG 7382  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 630  
 Contract SDG H1954

**METHOD SUMMARY**  
 CARBON 14 IN SOIL  
 LIQUID SCINTILLATION COUNTING

**RESULTS**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Carbon 14
Preparation batch 7052-014					
J00859	R211016-01	7382-001			U
J00860	R211016-02	7382-002			U
J00861	R211016-03	7382-003			U
J00862	R211016-04	7382-004			U
BLK (QC ID=43133)	R211016-06	7382-006			U
LCS (QC ID=43132)	R211016-05	7382-005			ok
Duplicate (R211016-03)	R211016-07	7382-007			- U

Nominal values and limits from method RDLs (pCi/g) 50  
 100 K Area - Quick Turn

**METHOD PERFORMANCE**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 7052-014 2σ prep error 10.0 % Reference Lab Notebook 7052 pg. 014															
J00859	R211016-01			3.5	0.293			100	100				11	11/15/02	11/15 LSC-006
J00860	R211016-02			3.5	0.297			100	100				11	11/15/02	11/15 LSC-006
J00861	R211016-03			3.9	0.266			100	100				11	11/15/02	11/15 LSC-006
J00862	R211016-04			3.7	0.281			100	100				11	11/15/02	11/15 LSC-006
BLK (QC ID=43133)	R211016-06			4.3	0.256			100	100					11/15/02	11/15 LSC-006
LCS (QC ID=43132)	R211016-05			5.9	0.256			100	<u>48</u>					11/15/02	11/15 LSC-006
Duplicate (R211016-03)	R211016-07			4.0	0.256			100	100				11	11/15/02	11/15 LSC-006
	(QC ID=43134)														

Nominal values and limits from method 50 0.256 50 180

PROCEDURES	REFERENCE	C14_COX_LSC
	CP-060	Soil Preparation, rev 4
	CP-251	Tritium/Carbon-14 Oxidation, rev 5

AVERAGES ± 2 SD	MDA <u>4.1</u> ± <u>1.7</u>
FOR 7 SAMPLES	YIELD <u>100</u> ± <u>0</u>

Lab id EBRLNE  
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 Form DVD-CMS  
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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H1954

**METHOD SUMMARY**  
NICKEL 63 IN SOIL  
LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID  
SDG 7382  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Contract SDG H1954

**RESULTS**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Nickel 63
Preparation batch 7052-014					
J00859	R211016-01	7382-001			9.51 J
J00860	R211016-02	7382-002			U
J00861	R211016-03	7382-003			1490
J00862	R211016-04	7382-004			213
BLK (QC ID=43133)	R211016-06	7382-006			U
LCS (QC ID=43132)	R211016-05	7382-005			ok
Duplicate (R211016-03)	R211016-07	7382-007			ok

Nominal values and limits from method RDLs (pCi/g) 30  
100 K Area - Quick Turn

**METHOD PERFORMANCE**

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 7052-014 2σ prep error 10.0 % Reference Lab Notebook 7052 pg. 014																
J00859	R211016-01			2.0	0.500			85	100				16	11/19/02	11/20	LSC-005
J00860	R211016-02			1.9	0.500			90	100				16	11/19/02	11/20	LSC-005
J00861	R211016-03			2.9	0.500			70	71				16	11/19/02	11/20	LSC-005
J00862	R211016-04			2.0	0.500			85	100				16	11/19/02	11/20	LSC-005
BLK (QC ID=43133)	R211016-06			1.8	0.500			98	100					11/19/02	11/20	LSC-005
LCS (QC ID=43132)	R211016-05			1.7	0.500			98	100					11/19/02	11/20	LSC-005
Duplicate (R211016-03)	R211016-07			2.7	0.500			84	57				16	11/19/02	11/20	LSC-005
(QC ID=43134)																

Nominal values and limits from method 30 0.500 30-105 50 180

PROCEDURES REFERENCE N163\_LSC  
CP-060 Soil Preparation, rev 4  
CP-431 Nickel-63 Purification, rev 5

AVERAGES ± 2 SD MDA 2.1 ± 0.93  
FOR 7 SAMPLES YIELD 87 ± 19

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REPORT GUIDE

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SAMPLE SUMMARY

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

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

The following notes apply to these reports:

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

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

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

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SDG 7382  
 Contact Melissa C. Mannion

R E P O R T G U I D E

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P R E P A R A T I O N B A T C H S U M M A R Y

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

The following notes apply to this report:

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

These qualifiers should be reviewed as follows:

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

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

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SAMPLE DELIVERY GROUP H1954

SDG 7382  
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**WORK SUMMARY**

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

The following notes apply to this report:

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

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DATA SHEET

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

The following notes apply to this report:

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

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

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

The following qualifiers are defined by the DVD system:

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

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DATA SHEET

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

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

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

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

- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

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

The following values are underlined to indicate possible problems:

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

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D A T A   S H E E T

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

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LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

- \* REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- \* The first, computed limits for the recovery reflect:
  1. The error of RESULT, including that introduced by rounding the result prior to printing.  
  
If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
  2. The error of ADDED.
  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- \* The second limits are protocol defined upper and lower QC limits for the recovery.
- \* The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

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

1. A fixed percentage specified in the protocol.

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DUPLICATE

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

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

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

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

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**R E P O R T   G U I D E**

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**M A T R I X   S P I K E**

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

2. The error of ADDED.

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

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

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MATRIX SPIKE

for the recovery.

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

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

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METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

- \* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- \* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- \* Aliquots are underlined if less than the nominal value specified for the method.
- \* Preparation factors are underlined if greater than the nominal value specified for the method.
- \* Dilution factors are underlined if greater than the nominal value specified for the method.
- \* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- \* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- \* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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

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

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

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

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

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

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METHOD SUMMARY

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

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

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

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

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Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B02-062-002		Page 1 of 1						
Collector MT Stankovich		Company Contact Mike Stankovich		Telephone No. 531-7620		Project Coordinator KESSNER, JH		Price Code <b>2E</b> Data Turnaround						
Project Destination 100 K Area - Quick Turn		Sampling Location 116-KW-3 <b>H1954 (7382)</b>		SAF No. B02-062		Air Quality <input type="checkbox"/> <b>15 day</b>								
Ice Chest No. <b>ERC-96-065</b>		Field Logbook No.		COA R16KW32000		Method of Shipment Fed EX								
Shipped To TMA/RECRE <b>DAS 11/6/02</b>		Offsite Property No. <b>A030033</b>		Bill of Lading/Air Bill No. <b>8358 1726 5588</b>										
POSSIBLE SAMPLE HAZARDS/REMARKS <i>Radioactive</i>				Preservation	None	None	None	None						
Special Handling and/or Storage				Type of Container	aG	Marinelli	aG	aG						
				No. of Container(s)	1	1	1	1						
				Volume	60mL	500mL	60mL	60mL						
SAMPLE ANALYSIS				See item (1) in Special Instructions.	See item (2) in Special Instructions.	Isotopic Uranium; Isotopic Plutonium;	Nickel-63; Strontium-89,90 - Total Sr; Carbon-14;	<b>MS 10/25/02</b>						<b>Rad Screens</b>
Sample No.	Matrix *	Sample Date	Sample Time											
J00859	SOIL	11-4-02	1010		✓	✓	✓							J00855
J00860	SOIL	11-4-02	1040		✓	✓	✓							J00856
J00861	SOIL	11-4-02	1045		✓	✓	✓							J00857
J00862	SOIL	11-4-02	1200		✓	✓	✓							J00858
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *		
Relinquished By/Removed From <i>MT Stankovich</i>		Date/Time 11-4-02 1515		Received By/Stored In <i>David St. John</i>		Date/Time 11-4-02 1515		(1) ICP Metals - 6010A (Supertrace) {Arsenic, Chromium, Lead}; Mercury - 7471 - (CV) (2) Gamma Spectroscopy - Screen {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} <b>DAS 11/6/02</b>  <i>M. Stankovich not available to relinquish for shipment to lab on 11/6/02 @ 1245 DAS 11/6/02</i>				S=Soil SB=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Dry Solid DL=Dry Liquid T=Tissue WP=Wipe L=Liquid V=Vegetation X=Other		
Relinquished By/Removed From <i>3728 Ref IB</i>		Date/Time 11/6/02 1245		Received By/Stored In <i>David St. John</i>		Date/Time 11/6/02 1245								
Relinquished By/Removed From <i>David St. John</i>		Date/Time 11/6/02 1245		Received By/Stored In <i>FED EX</i>		Date/Time 11/6/02								
Relinquished By/Removed From <i>FED EX</i>		Date/Time 11/7/02 9:30		Received By/Stored In <i>David St. John</i>		Date/Time 11/7/02 9:30 AM								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time								
LABORATORY SECTION	Received By			Title			Date/Time							
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By			Date/Time							

Richmond, CA Laboratory

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Date/Time received 11/7/02 9:30 AM

CoC No. B 02-062-002

Container I.D. No. ERC-46-065 Requested TAT (Days) 15 P.O. Received Yes [ ] No [ ]

INSPECTION

- 1. Custody seals on shipping container intact? Yes  No [ ] N/A [ ]
- 2. Custody seals on shipping container dated & signed? Yes  No [ ] N/A [ ]
- 3. Custody seals on sample containers intact? Yes  No [ ] N/A [ ]
- 4. Custody seals on sample containers dated & signed? Yes  No [ ] N/A [ ]
- 5. Packing material is: Wet [ ] Dry
- 6. Number of samples in shipping container: 4
- 7. Number of containers per sample: 3 (Or see CoC \_\_\_\_\_)
- 8. Paperwork agrees with samples? Yes  No [ ]
- 9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels
- 10. Samples are: In good condition  Leaking [ ] Broken Container [ ] Missing [ ]
- 11. Describe any anomalies: \_\_\_\_\_

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date \_\_\_\_\_

14. Received by [Signature] Date: 11/7/02 Time: 9:30 AM

Customer Sample No.	cpm	mr/hr	wipe	Customer Sample No.	cpm	mr/hr	wipe

Ion Chamber Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_

Alpha meter Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_

Survey Meter Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_