

SAF-B03-018

ERDF Groundwater Well Samples

FINAL DATA PACKAGE

E:MAIL RESULTS TO:

Tom Lazarski

N/A
INITIAL/DATE

MAIL COMPLETE COPY OF DATA PACKAGE TO:

Tom Lazarski

H9-03

(TL) 6-2-04
INITIAL/DATE

Rich Weiss

H9-01

(RW) 6-2-04
INITIAL/DATE

COMMENTS: (PLEASE INCLUDE THE FOLLOWING ON THE FAX COVER SHEET)

SDG

H2550

SAF-B03-018

Rad only

Chem only

X Rad & Chem

X Complete

Partial

RECEIVED
AUG 17 2004
EDMC



30 April 2004

Joan Kessner
Bechtel-Hanford, Inc.
3190 Washington Way
MSIN H9-03
Richland, WA 99352

**Subject: Contract No. 630
Analytical Data Package**

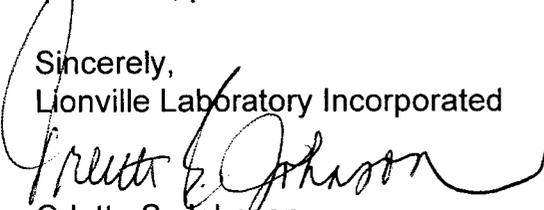
Dear Ms. Kessner:

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

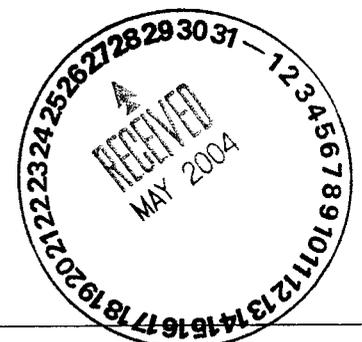
LvLI Batch #	0404L224
SDG #	H2550
SAF #	B03-018
Date Received	4-2-04
# Samples	7
Matrix	Water
Volatiles	X
Semivolatiles	
Pest/PCB	
PAH	
DRO/KRO/GRO	
GC Alcohols	
Herbicides	
Metals	X
Inorganics	X

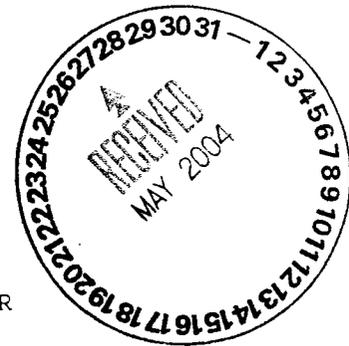
The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated


Orlette S. Johnson
Project Manager

r:\group\pm\orlette\tnu-hanford\data\b_ltrs.doc





Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD I04-028, #2550

DATE RECEIVED: 04/02/04

LVL LOT # :0404L224

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B18V41	001	W	04LVX093	03/31/04	N/A	04/12/04
B18V43	003	W	04LVX093	03/31/04	N/A	04/12/04
B18V45	005	W	04LVX093	03/31/04	N/A	04/12/04
B18V45	005 MS	W	04LVX093	03/31/04	N/A	04/12/04
B18V45	005 MSD	W	04LVX093	03/31/04	N/A	04/12/04
B18V47	007	W	04LVX093	03/31/04	N/A	04/12/04

LAB QC:

VBLKCY	MB1	W	04LVX093	N/A	N/A	04/12/04
VBLKCY	MB1 BS	W	04LVX093	N/A	N/A	04/12/04



Client: TNU-HANFORD I04-028
LVL #: 0404L224
SDG/SAF # H2550/I04-028

W.O. #: 11343-606-001-9999-00
Date Received: 04-02-2004

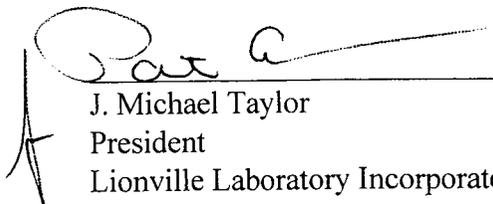
GC/MS VOLATILE

Four (4) water samples were collected on 03-31-2004.

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 04-12-2004.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were analyzed within required holding time.
3. Non-target compounds were not detected in the samples.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The method blank contained the common laboratory contaminant Methylene Chloride at a level less than the CRQL.
8. Internal standard area and retention time criteria were met.
9. "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."



J. Michael Taylor
President
Lionville Laboratory Incorporated

05-06-04
Date

som\group\data\voa\tnu-hanford\0404-224.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 18 pages.

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.
- 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.

sb\10-03\gloss.doc



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.

sb\10-03\gloss.doc



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.

LVL-21-21-035/A-08/93

9

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

Report Date: 04/30/04 09:46

Client: TNU-HANFORD I04-028, H2550 Work Order: 11343606001 Page: 1a

RFW Batch Number: 0404L224

Cust ID:	B18V41	B18V43	B18V45	B18V45	B18V45	B18V47
RFW#:	001	003	005	005 MS	005 MSD	007
Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L

Sample Information	B18V41	B18V43	B18V45	B18V45	B18V45	B18V47
Toluene-d8	98 %	103 %	101 %	98 %	98 %	101 %
Surrogate Bromofluorobenzene	90 %	98 %	99 %	93 %	92 %	95 %
Recovery 1,2-Dichloroethane-d4	99 %	106 %	110 %	100 %	97 %	105 %
Chloromethane	10 U					
Bromomethane	10 U					
Vinyl Chloride	10 U					
Chloroethane	10 U					
Methylene Chloride	4 JB	4 JB	5 JB	5 B	6 B	10 B
Acetone	10 U					
Carbon Disulfide	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U	97 %	101 %	5 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	2 J	2 J	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone	10 U					
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	7	7	5 U	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U	94 %	95 %	5 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	5 U	5 U	5 U	102 %	108 %	5 U
Trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	10 U					
2-Hexanone	10 U					
Tetrachloroethene	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	5 U	5 U	5 U	96 %	101 %	5 U

* = Outside of EPA CLP QC limits.

4

RFW Batch Number: 0404L224 Client: TNU-HANFORD I04-028 Work Order: 11343606001 Page: 1b
 Cust ID: B18V41 B18V45 B18V45 B18V45 B18V45 B18V45 B18V47
 RFW#: 001 003 005 005 MS 005 MSD 007

Chlorobenzene	5	U	5	U	94	%	99	%	5	U
Ethylbenzene	5	U	5	U	5	U	5	U	5	U
Styrene	5	U	5	U	5	U	5	U	5	U
Xylene (total)	5	U	5	U	5	U	5	U	5	U

* = Outside of EPA CLP QC limits.

6

Cust ID: VBLKCY VBLKCY BS

RFW#: 04LVX093-MB1 04LVX093-MB1

	5 U	97 %	5 U
Chlorobenzene	5 U		5 U
Ethylbenzene	5 U		5 U
Styrene	5 U		5 U
Xylene (total)	5 U		5 U

*= Outside of EPA CLP QC limits.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#

104-028-9

PNNL SDG # H2550

Page 2 of 2

Telephone No. 509-376-5056		MSIN		FAX	
Contact/Requestor DL STEWART		Sample Analysis		Preservative Cool 4C	
No/Type Container 1x500-ml P	TDS - 160.1				
1x500-ml aG aG	TOX - 9020				
1x500-ml P	ICP Metals - 6010TR (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)				

Sample No.	Lab ID	Date	Time	Print	Sign	Received By	Date/Time
B18V41	W	3-31-04	1300			Fred Ex	4/1/04 10:45 AM
B18V41	W					Fred Ex	4/1/04 3:00 PM
B18V42 (F)	W					D. Stewart	4-2-04/0945

Relinquished By F. M. HALL	Date/Time MAR 31 2004	Received By Fred Ex	Date/Time 4/1/04
Relinquished By Fred Ex	Date/Time 4/1/04	Received By Fred Ex	Date/Time 4/1/04
Relinquished By Fred Ex	Date/Time 4/1/04	Received By Fred Ex	Date/Time 4/1/04

Relinquished By YES	Date/Time 4-2-04/0945	Received By D. Stewart	Date/Time 4-2-04/0945
-------------------------------	--------------------------	---------------------------	--------------------------

Matrix *

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

FINAL SAMPLE DISPOSITION

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By

Date/Time

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

I04-028-100

Collector F. M. HALL
Project Title ERDFE MARCH 2004
SAF No. 09 71104 B03-018
Logbook No. DTS-SAWS-H-200
Method of Shipment GOVT. VEHICLE
Data Turnaround 45 Days
Ice Chest No. 5255-101
Bill of Lading/Air Bill No. 7911 9760 6964
Onsite Property No.

Contact/Requester DL STEWART
Sampling Origin HANFORD SITE
Telephone No. 509-376-5056
Purchase Order/Charge Code
MSIN
FAX

SPECIAL INSTRUCTIONS Hold Time
TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
 Batch all PNNL GW samples submitted under "I04" SAF's into one SDG, not to exceed SDG closure of 14 days.
 Submit invoices & deliverables to DL Stewart, PNNL

POSSIBLE SAMPLE HAZARDS/REMARKS
 ** **
 Total Activity Exemption: Yes No

Sample No.	Lab ID	Date	Time	No/Type Container	Sample Analysis	Preservative
B18V43	W	3-31-04	1300	3x40-mL aGs*	VOA - 8260A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B18V43	W			1x500-mL P	ICP Metals - 6010TR (Client List) (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)	HNO3 to pH <2
B18V43	W			1x500-mL P	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)	Cool 4C
B18V43	W			1x250-mL P	Alkalinity - 310.1	Cool 4C
B18V43	W			1x500-mL P	NO2/NO3 - 353.2	H2SO4 to pH <2 Cool 4C
B18V43	W			1x20-mL P	Activity Scan	None
B18V43	W			2x1000-mL P	Gross Alpha; Gross Beta	HNO3 to pH <2
B18V43	W			1x125-mL P	Carbon-14	None
B18V43	W			4x1000-mL P	Iodine-129	None
B18V43	W			2x1000-mL P	Radium -226	HNO3 to pH <2
B18V43	W			1x250-mL P	Technetium-99	HCl to pH <2
B18V43	W			1x125-mL P	Total Uranium	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
F. M. HALL			MAR 31 2004	Fred Ex				S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Fred Ex			4/1/04 9:30 AM	Fred Stevens			4/1/04 12:45 PM	DS = Drum Solids DL = Drum Liquid T = Tissue WI = Waste L = Liquid V = Vegetation X = Other
Fred Ex			4/1/04 3:00 PM	Fred Ex				
Fred Ex			4-2-04 09:45	D. J. Griffin				

FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

PNNL SDG 4 H2550

Collector **F. M. HALL** Telephone No. **509-376-5056** MSIN **FAX**
 SAF No. **11104 B03-018** Purchase Order/Charge Code
 Project Title **ERDF MARCH 2004** Ice Chest No. **505-116A** Temp. **7911 9760 6897**
 Shipped To (Lab) **TMA/RECRA** Bill of Lading/Air Bill No. **7911 9760 6897**
 Protocol **CERCLA** Onsite Property No.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
 TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
 Batch all PNNL GW samples submitted under "ID4" SAF's into one SDG, not to exceed SDG closure of 14 days.
 Submit invoices & deliverables to DL Stewart, PNNL

Sample No.	Lab ID	Date	Time	No/Type Container	Sample Analysis	Preservative
B18V45		3-31-04	09:20	3x40-mL aGs*	VOA - 8260A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B18V45				1x500-mL P	ICP Metals - 6010TR (Client List) (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)	HNO3 to pH <2
B18V45				1x500-mL P	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)	Cool 4C
B18V45				1x250-mL P	Alkalinity - 310.1	Cool 4C
B18V45				1x500-mL P	NO2/NO3 - 353.2	H2SO4 to pH <2 Cool 4C
B18V45				1x20-mL P	Activity Scan	None
B18V45				2x1000-mL P	Gross Alpha; Gross Beta	HNO3 to pH <2
B18V45				1x125-mL P	Carbon-14	None
B18V45				4x1000-mL P	Iodine-129	None
B18V45				2x1000-mL P	Radium -226	HNO3 to pH <2
B18V45				1x250-mL P	Technetium-99	HCl to pH <2
B18V45				1x125-mL P	Total Uranium	HNO3 to pH <2

Relinquished By **F. M. HALL** **Print** **Signature** **Date/Time** **13:28 MAR 31 2004**
Received By **Fred Ex** **Sign** **Date/Time**
Relinquished By **Fred Ex** **Print** **Signature** **Date/Time** **4/10/04 9:30 am**
Received By **Fred Sarano** **Sign** **Date/Time** **4/10/04 10:45**
Relinquished By **Fred Ex** **Print** **Signature** **Date/Time** **4/10/04 3:00 pm**
Received By **Fred Ex** **Sign** **Date/Time** **4/10/04 09:45**
Relinquished By **Fred Ex** **Print** **Signature** **Date/Time** **4-24-04 09:45**
Received By **D. Y. Yarnall** **Sign** **Date/Time** **4-24-04 09:45**

Matrix *
 S = Soil SE = Sediment T = Tissue
 SO = Solid SL = Sludge W = Water O = Oil A = Air
 DS = Drum Solids DL = Drum Liquid W1 = Wine L = Liquid V = Vegetation
 X = Other

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) **Disposed By** **D. Y. Yarnall** **Date/Time** **4-24-04 09:45**

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

PNNL

SDG # H2550

FAX

MSIN

Telephone No.

509-376-5056

Purchase Order/Charge Code

DL STEWART

HANEQD SITE

Logbook No.

DT5 - S AWS - H 250

Method of Shipment

GOVT. VEHICLE

Data Turnaround

45 Days

Temp.

Ice Chest No.

3405-101

Bill of Lading/Air Bill No. 7911 9760 6964

Onsite Property No.

Total Activity Exemption: Yes No

SPECIAL INSTRUCTIONS

Hold Time

TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
Batch all PNNL GW samples submitted under "104" SAF's into one SDG, not to exceed SDG closure of 14 days.
Submit invoices & deliverables to DL Stewart, PNNL

POSSIBLE SAMPLE HAZARDS/REMARKS

** **

Sample Analysis

Preservative
HCl or H2SO4 to
pH <2 Cool 4C
None

Sample No. B18V47

Lab ID W

Date 3-31-04

Time 0820

No/Type Container 3x40-ml aGs*

VOA - 8260A (TCL)

Activity Scan

1x20-ml P

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

3-31-04

Relinquished By P. McHALL

Print

Date/Time MAR 31 2004

Received By

Fred Ex

Sign

Date/Time

Relinquished By Fred Ex

Print

Date/Time 4/1/04

Received By

Fred Ex

Sign

Date/Time 10:45 AM

Relinquished By Fred Ex

Print

Date/Time 4/1/04

Received By

Fred Ex

Sign

Date/Time 4.2.04 10:45

FINAL SAMPLE DISPOSITION

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By

Date/Time

Date/Time

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

Lionville Laboratory Incorporated
SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: TNU Hanford

Date: 4-2-04

Purchase Order / Project# /
 SAF# / SOW# / Release #:

LvLJ Batch #:

Sample Custodian:

0404L224

[Signature]

NOTE: EXPLAIN ALL DISCREPANCIES

- | | | |
|---|---|--|
| 1. Samples Hand Delivered or <u>Shipped</u> | Carrier <u>MedEx</u> | Airbill# <u>7901 0618 8797</u> |
| 2. Custody seals on coolers or shipping container intact, signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals Comments |
| 3. Outside of coolers or shipping containers are free from damage? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 4. All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 5. Samples received <u>cooled</u> or ambient? | Temp <u>2.4°C</u> | Cooler # <u>SAWS-101</u> |
| 6. Custody seals on sample containers intact, signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals |
| 7. coc signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 8. Sample containers are intact? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 9. All samples on coc received? All samples received on coc? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 10. All sample label information matches coc? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 11. Samples properly preserved? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 12. Samples received within hold times? Short holds taken to wet lab? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 13. VOA, TOC, TOX free of headspace? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| 14. QC stickers placed on bottles designated by client? | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| 15. Shipment meets LvLJ Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 16. Project Manager contacted concerning discrepancies? name/date (or samples outside criteria) | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> No Discrepancies |

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNUHANFORD B03-018 H2550



DATE RECEIVED: 04/02/04

LVL LOT # :0404L224

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B18V41						
ARSENIC, TOTAL	001	W	04L0234	03/31/04	04/07/04	04/08/04
ARSENIC, TOTAL	001 REP	W	04L0234	03/31/04	04/07/04	04/08/04
ARSENIC, TOTAL	001 MS	W	04L0234	03/31/04	04/07/04	04/08/04
BARIUM, TOTAL	001	W	04L0234	03/31/04	04/07/04	04/08/04
BARIUM, TOTAL	001 REP	W	04L0234	03/31/04	04/07/04	04/08/04
BARIUM, TOTAL	001 MS	W	04L0234	03/31/04	04/07/04	04/08/04
CHROMIUM, TOTAL	001	W	04L0234	03/31/04	04/07/04	04/08/04
CHROMIUM, TOTAL	001 REP	W	04L0234	03/31/04	04/07/04	04/08/04
CHROMIUM, TOTAL	001 MS	W	04L0234	03/31/04	04/07/04	04/08/04
LEAD, TOTAL	001	W	04L0234	03/31/04	04/07/04	04/08/04
LEAD, TOTAL	001 REP	W	04L0234	03/31/04	04/07/04	04/08/04
LEAD, TOTAL	001 MS	W	04L0234	03/31/04	04/07/04	04/08/04
SELENIUM, TOTAL	001	W	04L0234	03/31/04	04/07/04	04/08/04
SELENIUM, TOTAL	001 REP	W	04L0234	03/31/04	04/07/04	04/08/04
SELENIUM, TOTAL	001 MS	W	04L0234	03/31/04	04/07/04	04/08/04
TIN, TOTAL	001	W	04L0234	03/31/04	04/07/04	04/08/04
TIN, TOTAL	001 REP	W	04L0234	03/31/04	04/07/04	04/08/04
TIN, TOTAL	001 MS	W	04L0234	03/31/04	04/07/04	04/08/04
VANADIUM, TOTAL	001	W	04L0234	03/31/04	04/07/04	04/08/04
VANADIUM, TOTAL	001 REP	W	04L0234	03/31/04	04/07/04	04/08/04
VANADIUM, TOTAL	001 MS	W	04L0234	03/31/04	04/07/04	04/08/04

B18V42

ARSENIC, SOLUBLE	002	W	04L0234	03/31/04	04/07/04	04/08/04
BARIUM, SOLUBLE	002	W	04L0234	03/31/04	04/07/04	04/08/04
CHROMIUM, SOLUBLE	002	W	04L0234	03/31/04	04/07/04	04/08/04
LEAD, SOLUBLE	002	W	04L0234	03/31/04	04/07/04	04/08/04
SELENIUM, SOLUBLE	002	W	04L0234	03/31/04	04/07/04	04/08/04
TIN, SOLUBLE	002	W	04L0234	03/31/04	04/07/04	04/08/04
VANADIUM, SOLUBLE	002	W	04L0234	03/31/04	04/07/04	04/08/04

B18V43

ARSENIC, TOTAL	003	W	04L0234	03/31/04	04/07/04	04/08/04
----------------	-----	---	---------	----------	----------	----------

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNUHANFORD B03-018 H2550

DATE RECEIVED: 04/02/04

LVL LOT # :0404L224

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BARIUM, TOTAL	003	W	04L0234	03/31/04	04/07/04	04/08/04
CHROMIUM, TOTAL	003	W	04L0234	03/31/04	04/07/04	04/08/04
LEAD, TOTAL	003	W	04L0234	03/31/04	04/07/04	04/08/04
SELENIUM, TOTAL	003	W	04L0234	03/31/04	04/07/04	04/08/04
TIN, TOTAL	003	W	04L0234	03/31/04	04/07/04	04/08/04
VANADIUM, TOTAL	003	W	04L0234	03/31/04	04/07/04	04/08/04

B18V44

ARSENIC, SOLUBLE	004	W	04L0234	03/31/04	04/07/04	04/08/04
BARIUM, SOLUBLE	004	W	04L0234	03/31/04	04/07/04	04/08/04
CHROMIUM, SOLUBLE	004	W	04L0234	03/31/04	04/07/04	04/08/04
LEAD, SOLUBLE	004	W	04L0234	03/31/04	04/07/04	04/08/04
SELENIUM, SOLUBLE	004	W	04L0234	03/31/04	04/07/04	04/08/04
TIN, SOLUBLE	004	W	04L0234	03/31/04	04/07/04	04/08/04
VANADIUM, SOLUBLE	004	W	04L0234	03/31/04	04/07/04	04/08/04

B18V45

ARSENIC, TOTAL	005	W	04L0234	03/31/04	04/07/04	04/08/04
BARIUM, TOTAL	005	W	04L0234	03/31/04	04/07/04	04/08/04
CHROMIUM, TOTAL	005	W	04L0234	03/31/04	04/07/04	04/08/04
LEAD, TOTAL	005	W	04L0234	03/31/04	04/07/04	04/08/04
SELENIUM, TOTAL	005	W	04L0234	03/31/04	04/07/04	04/08/04
TIN, TOTAL	005	W	04L0234	03/31/04	04/07/04	04/08/04
VANADIUM, TOTAL	005	W	04L0234	03/31/04	04/07/04	04/08/04

B18V46

ARSENIC, SOLUBLE	006	W	04L0234	03/31/04	04/07/04	04/08/04
BARIUM, SOLUBLE	006	W	04L0234	03/31/04	04/07/04	04/08/04
CHROMIUM, SOLUBLE	006	W	04L0234	03/31/04	04/07/04	04/08/04
LEAD, SOLUBLE	006	W	04L0234	03/31/04	04/07/04	04/08/04
SELENIUM, SOLUBLE	006	W	04L0234	03/31/04	04/07/04	04/08/04
TIN, SOLUBLE	006	W	04L0234	03/31/04	04/07/04	04/08/04
VANADIUM, SOLUBLE	006	W	04L0234	03/31/04	04/07/04	04/08/04

LAB QC:

ARSENIC LABORATORY	LC1 BS	W	04L0234	N/A	04/07/04	04/08/04
--------------------	--------	---	---------	-----	----------	----------

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-018 H2550

DATE RECEIVED: 04/02/04

LVL LOT # :0404L224

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	MB1	W	04L0234	N/A	04/07/04	04/08/04
BARIUM LABORATORY	LC1 BS	W	04L0234	N/A	04/07/04	04/08/04
BARIUM, TOTAL	MB1	W	04L0234	N/A	04/07/04	04/08/04
CHROMIUM LABORATORY	LC1 BS	W	04L0234	N/A	04/07/04	04/08/04
CHROMIUM, TOTAL	MB1	W	04L0234	N/A	04/07/04	04/08/04
LEAD LABORATORY	LC1 BS	W	04L0234	N/A	04/07/04	04/08/04
LEAD, TOTAL	MB1	W	04L0234	N/A	04/07/04	04/08/04
SELENIUM LABORATORY	LC1 BS	W	04L0234	N/A	04/07/04	04/08/04
SELENIUM, TOTAL	MB1	W	04L0234	N/A	04/07/04	04/08/04
TIN LABORATORY	LC1 BS	W	04L0234	N/A	04/07/04	04/08/04
TIN, TOTAL	MB1	W	04L0234	N/A	04/07/04	04/08/04
VANADIUM LABORATORY	LC1 BS	W	04L0234	N/A	04/07/04	04/08/04
VANADIUM, TOTAL	MB1	W	04L0234	N/A	04/07/04	04/08/04



Analytical Report

Client: TNU-HANFORD B03-018
LVL#: 0404L224
SDG/SAF#: H2550/B03-018

W.O.#: 11343-606-001-9999-00
Date Received: 04-02-04

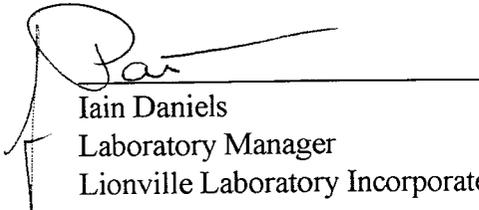
METALS CASE NARRATIVE

1. This narrative covers the analyses of 6 water 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. All results presented in this report are derived from samples that met LvLI'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. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
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.
10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
12. 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

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 23 pages.

region of less-certain quantification.

13. 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
jjw/m04-224

05-07-04
Date

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0404L224

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 ⁵	<u> </u> 200.7 <u> </u> 204.2			<u> </u> 99
Arsenic	<u> </u> 6010B <u> </u> 7060A ⁵	<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 ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Boron	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Cadmium	<u> </u> 6010B <u> </u> 7131A ⁵	<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 ⁵	<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 ⁵	<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 ⁵	<u> </u> 200.7 <u> </u> 239.2	<u> </u> 3113B		<u> </u> 99
Lithium	<u> </u> 6010B <u> </u> 7430 ⁴	<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 ³ <u> </u> 7471A ³	<u> </u> 245.1 ² <u> </u> 245.5 ²			<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 ⁴	<u> </u> 200.7 <u> </u> 258.1 ⁴			<u> </u> 99
Rare Earths	<u> </u> 6010B ¹	<u> </u> 200.7 ¹		<u> </u> 1620	<u> </u> 99
Selenium	<u> </u> 6010B <u> </u> 7740 ⁵	<u> </u> 200.7 <u> </u> 270.2	<u> </u> 3113B		<u> </u> 99
Silicon	<u> </u> 6010B ¹	<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 ⁵	<u> </u> 200.7 <u> </u> 272.2			<u> </u> 99
Sodium	<u> </u> 6010B <u> </u> 7770 ⁴	<u> </u> 200.7 <u> </u> 273.1 ⁴			<u> </u> 99
Strontium	<u> </u> 6010B	<u> </u> 200.7			<u> </u> 99
Thallium	<u> </u> 6010B <u> </u> 7841 ⁵	<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 ¹	<u> </u> 200.7 ¹		<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 ¹	<u> </u> 200.7 ¹		<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, 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 05/05/04

CLIENT: TNUHANFORD B03-018 H2550
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0404L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-001	B18V41	Arsenic, Total	3.4	u UG/L	3.4	1.0
		Barium, Total	63.5	UG/L	0.20	1.0
		Chromium, Total	38.7	UG/L	0.50	1.0
		Lead, Total	2.0	u UG/L	2.0	1.0
		Selenium, Total	3.6	UG/L	3.4	1.0
		Tin, Total	3.6	u UG/L	3.6	1.0
		Vanadium, Total	24.0	UG/L	0.50	1.0
-002	B18V42	Arsenic, Soluble	3.4	u UG/L	3.4	1.0
		Barium, Soluble	66.6	UG/L	0.20	1.0
		Chromium, Soluble	4.4	UG/L	0.50	1.0
		Lead, Soluble	2.0	u UG/L	2.0	1.0
		Selenium, Soluble	3.4	u UG/L	3.4	1.0
		Tin, Soluble	3.6	u UG/L	3.6	1.0
		Vanadium, Soluble	24.2	UG/L	0.50	1.0
-003	B18V43	Arsenic, Total	3.4	u UG/L	3.4	1.0
		Barium, Total	63.4	UG/L	0.20	1.0
		Chromium, Total	39.4	UG/L	0.50	1.0
		Lead, Total	2.0	UG/L	2.0	1.0
		Selenium, Total	5.4	UG/L	3.4	1.0
		Tin, Total	3.6	u UG/L	3.6	1.0
		Vanadium, Total	24.6	UG/L	0.50	1.0

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/05/04

CLIENT: TNUHANFORD B03-018 H2550
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0404L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
-004	B18V44	Arsenic, Soluble	3.4	u UG/L	3.4	1.0
		Barium, Soluble	66.5	UG/L	0.20	1.0
		Chromium, Soluble	3.8	UG/L	0.50	1.0
		Lead, Soluble	2.0	UG/L	2.0	1.0
		Selenium, Soluble	3.4	u UG/L	3.4	1.0
		Tin, Soluble	3.6	u UG/L	3.6	1.0
		Vanadium, Soluble	24.7	UG/L	0.50	1.0
-005	B18V45	Arsenic, Total	3.4	u UG/L	3.4	1.0
		Barium, Total	0.20	u UG/L	0.20	1.0
		Chromium, Total	0.60	UG/L	0.50	1.0
		Lead, Total	2.0	u UG/L	2.0	1.0
		Selenium, Total	3.4	u UG/L	3.4	1.0
		Tin, Total	3.6	u UG/L	3.6	1.0
		Vanadium, Total	0.50	u UG/L	0.50	1.0
-006	B18V46	Arsenic, Soluble	3.4	u UG/L	3.4	1.0
		Barium, Soluble	0.20	u UG/L	0.20	1.0
		Chromium, Soluble	0.50	u UG/L	0.50	1.0
		Lead, Soluble	2.0	u UG/L	2.0	1.0
		Selenium, Soluble	3.4	u UG/L	3.4	1.0
		Tin, Soluble	3.6	u UG/L	3.6	1.0
		Vanadium, Soluble	0.50	u UG/L	0.50	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/05/04

CLIENT: TNUHANFORD B03-018 H2550

LVL LOT #: 0404L224

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
BLANK1	04L0234-MB1	Arsenic, Total	3.4	u UG/L	3.4	1.0
		Barium, Total	0.20	u UG/L	0.20	1.0
		Chromium, Total	0.50	u UG/L	0.50	1.0
		Lead, Total	2.0	u UG/L	2.0	1.0
		Selenium, Total	3.4	u UG/L	3.4	1.0
		Tin, Total	3.6	u UG/L	3.6	1.0
		Vanadium, Total	0.50	u UG/L	0.50	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/05/04

CLIENT: TNUHANFORD B03-018 H2550
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0404L224

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
=====	=====	=====	=====	=====	=====	=====	=====
-001	B18V41	Arsenic, Total	1820	3.4 u	2000	91.1	1.0
		Barium, Total	1820	63.5	2000	87.9	1.0
		Chromium, Total	231	38.7	200	96.2	1.0
		Lead, Total	454	2.0 u	500	90.7	1.0
		Selenium, Total	1840	3.6	2000	91.6	1.0
		Tin, Total	924	3.6 u	1000	92.4	1.0
		Vanadium, Total	472	24.0	500	89.7	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/05/04

CLIENT: TNUHANFORD B03-018 H2550

LVL LOT #: 0404L224

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE RPD		
=====	=====	=====	=====	=====	=====	=====
-001REP	B18V41	Arsenic, Total	3.4 u	3.4 u	NC	1.0
		Barium, Total	63.5	61.6	3.0	1.0
		Chromium, Total	38.7	39.4	1.8	1.0
		Lead, Total	2.0 u	2.0 u	NC	1.0
		Selenium, Total	3.6	3.6	0.00	1.0
		Tin, Total	3.6 u	3.6 u	NC	1.0
		Vanadium, Total	24.0	23.9	0.42	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 05/05/04

CLIENT: TNUHANFORD B03-018 H2550
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0404L224

SAMPLE	SITE ID	ANALYTE	SPIKED		UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	04L0234-LC1	Arsenic, LCS	9430	10000	UG/L	94.3
		Barium, LCS	4780	5000	UG/L	95.5
		Chromium, LCS	476	500	UG/L	95.3
		Lead, LCS	2400	2500	UG/L	95.9
		Selenium, LCS	9570	10000	UG/L	95.7
		Tin, LCS	4710	5000	UG/L	94.2
		Vanadium, LCS	2350	2500	UG/L	93.8

(6) VOA, Met, dug, Nickel

Custody Transfer Record/Lab Work Request Page 1 of 1



Lionville Laboratory Use Only
0104224

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS
A.C.

J D E F G H I J

MATRIX CODES:	Lab ID	Client ID/Description	Date Rec'd	Date Due	Refrigerator #		#/Type Container	Volume	Preservatives	ANALYSES REQUESTED				Metal	Air Cont	NO ₂	NO ₃	TDS	TOX
					MS	MSD				VOA	BNA	Post PCB	Herb						
					MS	MSD				MS	MSD	MS	MSD						
S - Soil	001	B18V41	4.2.04	5/2/04	39		Liquid												
SE - Sediment	002	B18V42					Solid												
SO - Solid	003	B18V43					Liquid												
SL - Sludge	004	B18V44					Solid												
W - Water	005	B18V45																	
O - Oil	006	B18V46																	
A - Air	007	B18V47																	
DS - Drum Solids																			
DL - Drum Liquids																			
L - EP/TCLP Leachate																			
WI - Wipe																			
X - Other																			
F - Fish																			

DATE/REVISIONS:
5/3/04 1. SAF # changed per client

Special Instructions:
METD = As, Ba, Cr, Pb, Se, Sn, V
ICD = ICCL, ICFL, ICN03, ICN02, ICPO4, IC504
Run Matrix QC

Relinquished by	Received by	Date	Time
DeedEx	W.J. Smith	4.2.04	0945

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

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

Lionville Laboratory Use Only

Tamper Resistant Seal was:
 1) Shipped _____ or _____
 2) Present on Outer Package Y or N
 Hand Delivered _____
 Airbill # _____
 2) Ambient or Chilled _____
 3) Received in Good Condition Y or N
 4) Samples Properly Preserved Y or N
 5) Received Within Holding Times Y or N
 4) Unbroken on Sample Y or N
 Sample Y or N
 COC Record Present Upon Sample Rec't Y or N
 Cooler Temp. _____ °C

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector F. M. HALL
SAF No. 104-928
Project Title ERDE MARCH 2004
Shipped To (Lab) TMA/RECRA
Protocol CERCLA
Contact/Requester DL STEWART
Sampling Origin HANFORD SITE
Logbook No. DTS - SAWS - 4820
Method of Shipment GOVT. VEHICLE
Data Turnaround 45 Days
Telephone No. 502-376-5056
Purchase Order/Charge Code
Ice Chest No. 2435-101
Bill of Lading/Air Bill No. 7911 9760 6964
Offsite Property No.
MSIN
FAX
Temp.
Total Activity Exemption: Yes No

SPECIAL INSTRUCTIONS Hold Time
TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
 Batch all PNNL GW samples submitted under "104" SAF's into one SDG, not to exceed SDG closure of 14 days.
 Submit invoices & deliverables to DL Stewart, PNNL.

Sample No.	Lab ID	Date	Time	No/Type Container	Sample Analysis	Preservative
B18V41		3-31-04	1300	3x40-mL aGs*	VOA - 8260A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B18V41				1x500-mL P	ICP Metals - 6010TR (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)	HNO3 to pH <2
B18V41				1x500-mL P	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)	Cool 4C
B18V41				1x250-mL P	Alkalinity - 310.1	Cool 4C
B18V41				1x500-mL P	NO2/NO3 - 353.2	H2SO4 to pH <2 Cool 4C
B18V41				1x20-mL P	Activity Scan	None
B18V41				2x1000-mL P	Gross Alpha; Gross Beta	HNO3 to pH <2
B18V41				1x125-mL P	Carbon-14	None
B18V41				4x1000-mL P	Iodine-129	None
B18V41				2x1000-mL P	Radium -226	HNO3 to pH <2
B18V41				1x250-mL P	Technetium-99	HCl to pH <2
B18V41				1x125-mL P	Total Uranium	HNO3 to pH <2

Relinquished By F. M. HALL **Date/Time** MAR 31 2004 1300
Received By Fred Ex **Sign**
Relinquished By Fred Ex **Date/Time** 04/01/04 9:36am
Received By Fred Ex **Sign**
Relinquished By Fred Ex **Date/Time** 4/1/04 3:00 pm
Received By Fred Ex **Sign**
Relinquished By Fred Ex **Date/Time** 4.2.04 0945
Received By Fred Ex **Sign**
Matrix *
 DS = Drum Solids
 DL = Drum Liquid
 T = Tissue
 WI = Wine
 L = Liquid
 V = Vegetation
 X = Other
 S = Soil
 SE = Sediment
 SO = Solid
 SL = Sludge
 W = Water
 O = Oil
 A = Air
Disposal Method (e.g., Return to customer, per lab procedure, used in process)
Disposed By DL Stewart
Date/Time 4.2.04 10945

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

PNNL SDG # **H2550**

4/1/04

B03-018

Sample No.	Lab ID	Date	Time	No./Type Container	TDS - 180.1	TOX - 9020	ICP Metals - 6010TR (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)	Preservative
B18V41	W	3-31-04	1300	1x500-mL P	-	-		Cool 4C
B18V41	W			1x500-mL aGS aGS				H2SO4 to pH <2 Cool 4C
B18V42 (F)	W			1x500-mL P				HNO3 to pH <2
3-31-04								

Contact/Requestor **DL STEWART**

Telephone No. **509-376-5056**

MSIN **FAX**

Sample Analysis

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
F.M. HALL			MAR 31 2004 1339	Fed Ex				S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquid T = Tissue WI = Wine LV = Liquid V = Vegetation X = Other
	Fed Ex		4/1/04 9:30 am	Fred Sarias		John	4/1/04 12:45 PM	
	John		4/1/04 3:00 pm	Fed Ex				
	John		4.2.04 10:45	D. Johnson			4.2.04 10:45	

FINAL SAMPLE DISPOSITION

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

PNNL J.D.G # H2550

Collector **F. M. HALL**
 Telephone No. **509-376-5056**
 MSIN
 FAX
 SAF No. **41104 B03-018**
 Purchase Order/Charge Code
 Project Title **ERDE MARCH 2004**
 Ice Chest No. **SALS-101**
 Temp. **7911 9760 6964**
 Shipped To (Lab) **TMA/RECRA**
 Bill of Lading/Air Bill No. **7911 9760 6964**
 Protocol **CERCLA**
 Offsite Property No.

SPECIAL INSTRUCTIONS Hold Time
 TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
 Batch all PNNL GW samples submitted under "104" SAF's into one SDG, not to exceed SDG closure of 14 days.
 Submit invoices & deliverables to DL Stewart, PNNL

Total Activity Exemption: Yes No

Sample No.	Lab ID	Date	Time	No/Type Container	Sample Analysis	Preservative
B18V43		3-31-04	1300	3x40-mL aGs*	VOA - 8260A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B18V43				1x500-mL P	ICP Metals - 6010TR (Client List) (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)	HNO3 to pH <2
B18V43				1x500-mL P	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)	Cool 4C
B18V43				1x250-mL P	Alkalinity - 310.1	Cool 4C
B18V43				1x500-mL P	NO2/NO3 - 353.2	H2SO4 to pH <2 Cool 4C
B18V43				1x20-mL P	Activity Scan	None
B18V43				2x1000-mL P	Gross Alpha; Gross Beta	HNO3 to pH <2
B18V43				1x125-mL P	Carbon-14	None
B18V43				4x1000-mL P	Iodine-129	None
B18V43				2x1000-mL P	Radium -226	HNO3 to pH <2
B18V43				1x250-mL P	Technetium-99	HCl to pH <2
B18V43				1x125-mL P	Total Uranium	HNO3 to pH <2

Relinquished By **F. M. HALL** Date/Time **1550** Received By **Fred Ex** Date/Time **4/1/04 9:30 AM**
 Relinquished By **Fred Ex** Date/Time **MAR 31 2004** Received By **Fred Saraco** Date/Time **4/1/04 10:45 AM**
 Relinquished By **Fred Ex** Date/Time **4/1/04 9:30 AM** Received By **Fred Ex** Date/Time **4/1/04 3:00 PM**
 Relinquished By **Fred Ex** Date/Time **4/1/04 9:30 AM** Received By **D. Griffin** Date/Time **4-2-04 09:45**

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

FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)
 Disposed By **D. Griffin** Date/Time **4-2-04 09:45**

PNL S DG # H2550

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#

104-028-10

Page 2 of 2

Sample No.	Lab ID	Date	Time	Contact/Requestor	Telephone No.	MSIN	FAX	Preservative
B18V43	W	3-31-04	1200	DL STEWART	509-376-5056			Cool 4C
B18V43	W			TDS - 160.1	Sample Analysis			H2SO4 to pH <2 Cool 4C
B18V44 (F)	W			TOX - 9020				HNO3 to pH <2
				ICP Metals - 6010TR (Client List) (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)				

Relinquished By F. M. HALL	Print <i>[Signature]</i>	Sign	Received By Fed Ex	Print	Sign	Date/Time MAR 31 2004 1330	Date/Time	Matrix *
Relinquished By Fed Ex	Print 4/1/04	Sign	Received By Fred Savano JAD	Print	Sign	Date/Time 9:30 AM	Date/Time 4/1/04 10:45 AM	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquor T = Tissue WI = Wine L = Liquid V = Vegetation X = Other
Relinquished By Fred Savano	Print 4/1/04	Sign	Received By Fred Ex	Print	Sign	Date/Time 3:00 PM	Date/Time 4.2.04 / 0945	
Relinquished By Fred Ex	Print 4.2.04	Sign	Received By D. Ignish	Print	Sign	Date/Time 4.2.04 10945	Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)			Disposed By		Date/Time		

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: **F. M. HALL** Telephone No. **509-376-5056** MSIN **DL STEWART** FAX **509-376-5056**
 AF No. **4-11104** B03-018 Purchase Order/Charge Code
 Project Title: **ERDE MARCH 2004** Ice Chest No. **5773-2010** Temp. **5WS-116A**
 Mine to (Lab): **ERDE MARCH 2004** Bill of Lading/Air Bill No. **7911 9760 6997**
 TMA/RECRA Protocol: **ERDE MARCH 2004** Offsite Property No.

SPECIAL INSTRUCTIONS Hold Time: **45 Days** Total Activity Exemption: Yes No
TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
 Batch all PNNL GW samples submitted under "104" SAF's into one SDG, not to exceed SDG closure of 14 days.
 Submit invoices & deliverables to DL Stewart, PNNL

Sample No.	Lab ID	Date	Time	No/Type Container	Sample Analysis	Preservative
B18V45		3-31-04	09:20	3x400-mL aGs*	VOA - 8260A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B18V45				1x500-mL P	ICP Metals - 6010TR (Client List) (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)	HNO3 to pH <2
B18V45				1x500-mL P	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)	Cool 4C
B18V45				1x250-mL P	Alkalinity - 310.1	Cool 4C
B18V45				1x500-mL P	NO2/NO3 - 353.2	H2SO4 to pH <2 Cool 4C
B18V45				1x20-mL P	Activity Scan	None
B18V45				2x1000-mL P	Gross Alpha; Gross Beta	HNO3 to pH <2
B18V45				1x125-mL P	Carbon-14	None
B18V45				4x1000-mL P	Iodine-129	None
B18V45				2x1000-mL P	Radium -226	HNO3 to pH <2
B18V45				1x250-mL P	Technetium-99	HCl to pH <2
B18V45				1x125-mL P	Total Uranium	HNO3 to pH <2

Relinquished By: F. M. HALL (Print) **Signature:** [Signature] **Date/Time:** 1338 MAR 31 2004 **Sign:** Fed Ex

Relinquished By: Fred Sarao (Print) **Signature:** [Signature] **Date/Time:** 4/1/04 9:30 am **Sign:** Fed Ex

Relinquished By: Fred Sarao (Print) **Signature:** [Signature] **Date/Time:** 4/1/04 3:00 pm **Sign:** Fed Ex

Relinquished By: Fred Sarao (Print) **Signature:** [Signature] **Date/Time:** 4-2-04 09:45 **Sign:** Fed Ex

Matrix:
 S = Soil, SE = Sediment, SO = Solid, SL = Sludge, W = Water, O = Air
 DS = Drum Solids, DL = Drum Liquid, T = Tissue, WI = Wine, L = Liquid, V = Vegetation, X = Other

FINAL SAMPLE DISPOSITION: Disposed By: [Signature] Date/Time: 4-2-04 09:45

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SAF No. I04-028	Telephone No. 509-376-5036	MSIN	FAX
Contact/Requestor DL STEWART	Sample Analysis		Preservative Cool 4C
No/Type Container 1x500-ml P	TDS - 160.1		H2SO4 to pH <2 Cool 4C
1x500-ml aGs*	TOX - 9020		HNO3 to pH <2
1x500-ml P	ICP Metals - 6010TR (Client List) (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)		

Sample No.	Lab ID	Date	Time
B18V45	W	3-31-04	0800
B18V45	W		
B18V46 (F)	W		
<i>(Signature)</i>			
3-31-04			

Relinquished By	Print	Sign	Date/Time
F.M. HALL	<i>(Signature)</i>	Fred Ex	MAR 31 2004

Received By	Print	Sign	Date/Time
Fred Ex	Fred Ex	Fred Ex	4/10/04 10:45AM
Fred Ex	Fred Ex	Fred Ex	4/10/04 3:00 PM

Relinquished By	Print	Sign	Date/Time
Fred Ex	Fred Ex	Fred Ex	4-20-04/0945

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

Final Sample Disposition: *(Signature)* 4-20-04/0945

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

PNNL
 SDG 4 H2550

Collector F.M. HALL	Contact/Requester DL STEWART	Telephone No. 509-376-5056	MSIN	FAX
SAF No. 47104 B03-018	Sampling Origin HANFORD SITE	Purchase Order/Charge Code		
Project Title ERDF MARCH 2004	Logbook No. DTS - S AWS - H 250	Temp.		
Shipped To (Lab) TMA/RECRA	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 79119760 6964		
Protocol GERCLA	Data Turnaround 45 Days	Offsite Property No.		

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
 TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
 Batch all PNNL GW samples submitted under "104" SAF's into one SDG, not to exceed SDG closure of 14 days.
 Submit invoices & deliverables to DL Stewart, PNNL.

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B18V47		W	3-31-04	0830	3x40-mL aGs*	VOA - 8260A (TCL)	HCl or H2SO4 to pH < 2 Cool 4C
B18V47		W	3-31-04	1	1x20-mL P	Activity Scan	None

Relinquished By F.M. HALL	Print	Sign	Date/Time MAR 31 2004 1:30	Received By Fred Ex	Print	Sign	Date/Time 4/1/04	Matrix * S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liouli T = Tissue WI = Wine L = Liquid V = Vegetation X = Other
Relinquished By Fred Ex			Date/Time 9:30 AM	Received By Fred Saraco			Date/Time 4/1/04	
Relinquished By Fred Saraco			Date/Time 3:00 pm	Received By Fred Ex			Date/Time 4/1/04	
Relinquished By Fred Ex			Date/Time 4:20 AM 10/15	Received By D. J. [Signature]			Date/Time 4:20 AM 10/15	
FINAL SAMPLE DISPOSITION								Date/Time

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Lionville Laboratory Incorporated
SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: TNU Hanford

Date: 4-2-04

Purchase Order / Project# /

SAF# / SOW# / Release #:

LvLI Batch #:

Sample Custodian:

0104L224

[Signature]

NOTE: EXPLAIN ALL DISCREPANCIES

- | | | |
|---|---|--|
| 1. Samples Hand Delivered or <u>Shipped</u> | Carrier <u>FedEx</u> | Airbill# <u>7901 0618 8797</u> |
| 2. Custody seals on coolers or shipping container intact, signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals Comments |
| 3. Outside of coolers or shipping containers are free from damage? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 4. All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 5. Samples received <u>cooled</u> or ambient? | Temp <u>2.4°C</u> | Cooler # <u>SAWS-101</u> |
| 6. Custody seals on sample containers intact, signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals |
| 7. coc signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 8. Sample containers are intact? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 9. All samples on coc received? All samples received on coc? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 10. All sample label information matches coc? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 11. Samples properly preserved? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 12. Samples received within hold times? Short holds taken to wet lab? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 13. VOA, TOC, TOX free of headspace? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| 14. QC stickers placed on bottles designated by client? | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 16. Project Manager contacted concerning discrepancies? name/date (or samples outside criteria) | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> No Discrepancies |

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNUHANFORD B03-018 H2550



DATE RECEIVED: 04/02/04

LVL LOT # :0404L224

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	ANALYSIS TIME
B18V41							
ALKALINITY	001	W	04LAK010	03/31/04	04/07/04	04/07/04	
ALKALINITY	001 REP	W	04LAK010	03/31/04	04/07/04	04/07/04	
CHLORIDE BY IC	001	W	04LICA21	03/31/04	04/07/04	04/07/04	
CHLORIDE BY IC	001 REP	W	04LICA21	03/31/04	04/07/04	04/07/04	
CHLORIDE BY IC	001 MS	W	04LICA21	03/31/04	04/07/04	04/07/04	
FLUORIDE BY IC	001	W	04LICA21	03/31/04	04/07/04	04/07/04	
FLUORIDE BY IC	001 REP	W	04LICA21	03/31/04	04/07/04	04/07/04	
FLUORIDE BY IC	001 MS	W	04LICA21	03/31/04	04/07/04	04/07/04	
NITRITE BY IC	001	W	04LICA21	03/31/04	04/07/04	04/07/04	1622
NITRITE BY IC	001 REP	W	04LICA21	03/31/04	04/07/04	04/07/04	1636
NITRITE BY IC	001 MS	W	04LICA21	03/31/04	04/07/04	04/07/04	1651
NITRATE BY IC	001	W	04LICA21	03/31/04	04/07/04	04/07/04	1747
NITRATE BY IC	001 REP	W	04LICA21	03/31/04	04/07/04	04/07/04	1801
NITRATE BY IC	001 MS	W	04LICA21	03/31/04	04/07/04	04/07/04	1816
PHOSPHATE BY IC	001	W	04LICA21	03/31/04	04/07/04	04/07/04	1622
PHOSPHATE BY IC	001 REP	W	04LICA21	03/31/04	04/07/04	04/07/04	1636
PHOSPHATE BY IC	001 MS	W	04LICA21	03/31/04	04/07/04	04/07/04	1651
SULFATE BY IC	001	W	04LICA21	03/31/04	04/07/04	04/07/04	
SULFATE BY IC	001 REP	W	04LICA21	03/31/04	04/07/04	04/07/04	
SULFATE BY IC	001 MS	W	04LICA21	03/31/04	04/07/04	04/07/04	
NITRATE NITRITE	001	W	04LN3023	03/31/04	04/26/04	04/26/04	
TOTAL DISSOLVED SOLI	001	W	04LSS065	03/31/04	04/05/04	04/05/04	
TOTAL ORGANIC HALIDE	001	W	04LX009	03/31/04	04/13/04	04/27/04	
TOTAL ORGANIC HALIDE	001 REP	W	04LX009	03/31/04	04/13/04	04/27/04	

B18V43

ALKALINITY	003	W	04LAK010	03/31/04	04/07/04	04/07/04	
CHLORIDE BY IC	003	W	04LICA21	03/31/04	04/07/04	04/07/04	
FLUORIDE BY IC	003	W	04LICA21	03/31/04	04/07/04	04/07/04	
NITRITE BY IC	003	W	04LICA21	03/31/04	04/07/04	04/07/04	1830
NITRATE BY IC	003	W	04LICA21	03/31/04	04/07/04	04/07/04	1927
PHOSPHATE BY IC	003	W	04LICA21	03/31/04	04/07/04	04/07/04	1830
SULFATE BY IC	003	W	04LICA21	03/31/04	04/07/04	04/07/04	
NITRATE NITRITE	003	W	04LN3023	03/31/04	04/26/04	04/26/04	

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNUHANFORD B03-018 H2550

DATE RECEIVED: 04/02/04

LVL LOT # :0404L224

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	ANALYSIS TIME
NITRATE NITRITE	003 REP	W	04LN3023	03/31/04	04/26/04	04/26/04	
NITRATE NITRITE	003 MS	W	04LN3023	03/31/04	04/26/04	04/26/04	
TOTAL DISSOLVED SOLI	003	W	04LSS065	03/31/04	04/05/04	04/05/04	
TOTAL ORGANIC HALIDE	003	W	04LX009	03/31/04	04/13/04	04/27/04	
TOTAL ORGANIC HALIDE	003 MS	W	04LX009	03/31/04	04/13/04	04/27/04	

B18V45

ALKALINITY	005	W	04LAK010	03/31/04	04/07/04	04/07/04	
CHLORIDE BY IC	005	W	04LICA21	03/31/04	04/07/04	04/07/04	
FLUORIDE BY IC	005	W	04LICA21	03/31/04	04/07/04	04/07/04	
NITRITE BY IC	005	W	04LICA21	03/31/04	04/07/04	04/07/04	1941
NITRATE BY IC	005	W	04LICA21	03/31/04	04/07/04	04/07/04	1941
PHOSPHATE BY IC	005	W	04LICA21	03/31/04	04/07/04	04/07/04	1941
SULFATE BY IC	005	W	04LICA21	03/31/04	04/07/04	04/07/04	
NITRATE NITRITE	005	W	04LN3023	03/31/04	04/26/04	04/26/04	
TOTAL DISSOLVED SOLI	005	W	04LSS065	03/31/04	04/05/04	04/05/04	
TOTAL DISSOLVED SOLI	005 REP	W	04LSS065	03/31/04	04/05/04	04/05/04	
TOTAL ORGANIC HALIDE	005	W	04LX009	03/31/04	04/13/04	04/27/04	

LAB QC:

ALKALINITY	MB1	W	04LAK010	N/A	04/07/04	04/07/04	
ALKALINITY	MB1 BS	W	04LAK010	N/A	04/07/04	04/07/04	
ALKALINITY	MB1 BSD	W	04LAK010	N/A	04/07/04	04/07/04	
CHLORIDE BY IC	MB1	W	04LICA21	N/A	04/07/04	04/07/04	
CHLORIDE BY IC	MB1 BS	W	04LICA21	N/A	04/07/04	04/07/04	
FLUORIDE BY IC	MB1	W	04LICA21	N/A	04/07/04	04/07/04	
FLUORIDE BY IC	MB1 BS	W	04LICA21	N/A	04/07/04	04/07/04	
NITRITE BY IC	MB1	W	04LICA21	N/A	04/07/04	04/07/04	
NITRITE BY IC	MB1 BS	W	04LICA21	N/A	04/07/04	04/07/04	
NITRATE BY IC	MB1	W	04LICA21	N/A	04/07/04	04/07/04	
NITRATE BY IC	MB1 BS	W	04LICA21	N/A	04/07/04	04/07/04	
PHOSPHATE BY IC	MB1	W	04LICA21	N/A	04/07/04	04/07/04	
PHOSPHATE BY IC	MB1 BS	W	04LICA21	N/A	04/07/04	04/07/04	
SULFATE BY IC	MB1	W	04LICA21	N/A	04/07/04	04/07/04	
SULFATE BY IC	MB1 BS	W	04LICA21	N/A	04/07/04	04/07/04	
NITRATE NITRITE	MB1	W	04LN3023	N/A	04/26/04	04/26/04	

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B03-018 H2550

DATE RECEIVED: 04/02/04

LVL LOT # :0404L224

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NITRATE NITRITE	MB1 BS	W	04LN3023	N/A	04/26/04	04/26/04
TOTAL DISSOLVED SOLI	MB1	W	04LSS065	N/A	04/05/04	04/05/04
TOTAL DISSOLVED SOLI	MB1 BS	W	04LSS065	N/A	04/05/04	04/05/04
TOTAL DISSOLVED SOLI	MB1 BSD	W	04LSS065	N/A	04/05/04	04/05/04
TOTAL ORGANIC HALIDE	LC1 BS	W	04LX009	N/A	04/13/04	04/13/04
TOTAL ORGANIC HALIDE	MB1	W	04LX009	N/A	04/13/04	04/13/04



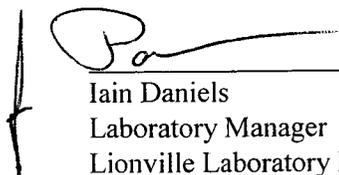
Analytical Report

Client: TNU-HANFORD B03-018 H2550
LVL#: 0404L224

W.O.#: 11343-606-001-9999-00
Date Received: 04-02-04

INORGANIC NARRATIVE

1. This narrative covers the analyses of 3 water samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.
3. Sample holding times as required by the method and/or contract were met with the exception of Nitrite, Nitrate and Phosphate (see the sample chronology summary for analyses times for short hold samples).
4. The results presented in this report are derived from samples that met LVL's sample acceptance policy with the exception of sample B18V45 as noted on the Sample Receipt Checklist.
5. The method blanks were within the method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Alkalinity and Total Dissolved Solids (TDS) were within the 20% Relative Percent Difference (RPD) control limit.
7. The matrix spike recoveries for Chloride, Fluoride, Nitrite, Nitrate, Phosphate, Sulfate, Nitrate Nitrite and Total Organic Halides (TOX) were within the 75-125% control limits.
8. The replicate analyses for Alkalinity, Chloride, Fluoride, Nitrite, Nitrate, Phosphate, Sulfate, TOX, Nitrate Nitrite and TDS were within the 20% Relative Percent Difference (RPD) control limit.
9. 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 Incorporated

ijpi04-224

05-07-04
Date

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 21 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	<u>EPA /600</u>	<u>SW846</u>	<u>OTHER</u>
Acidity	305.1		
<input checked="" type="checkbox"/> Alkalinity <input type="checkbox"/> Bicarbonate <input type="checkbox"/> Carbonate	<input checked="" type="checkbox"/> 310.1		5210B (b)
BOD	405.1		
Ion Chromatography:			
<input type="checkbox"/> Bromide <input checked="" type="checkbox"/> Chloride <input checked="" type="checkbox"/> Fluoride	300.0	9056	
<input checked="" type="checkbox"/> Nitrate <input checked="" type="checkbox"/> Nitrite <input checked="" type="checkbox"/> Phosphate	300.0	9056	
<input checked="" type="checkbox"/> Sulfate <input type="checkbox"/> Formate <input type="checkbox"/> Acetate <input type="checkbox"/> Oxalate	300.0	9056	
Chloride	325.2	9251	
Chlorine, Residual	330.5 (mod)		
Cyanide, Amenable to Chlorination	335.2	9010B	
Cyanide, Total	335.2	9010B	9014 4500CN-1 (b)
Cyanide, Weak Acid Dissociable			ILMO4.0 (e) 412 (a) 5220C (b)
COD	410.4(mod)		
Color	110.2		
Corrosivity by Coupon		1110(mod)	
Chromium VI		7196A	3500Cr-D (b) 4500-FC
Fluoride	340.2		
Hardness, Calcium	215.2		
Hardness, Total	130.2		
Iodide			ASTM D19P202 (1)
Surfactant	425.1		
<input checked="" type="checkbox"/> Nitrate-Nitrite <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite	<input checked="" type="checkbox"/> 353.2		
Ammonia	350.3		
Total <input type="checkbox"/> Kjeldahl <input type="checkbox"/> Organic Nitrogen	351.3		
Total <input type="checkbox"/> Organic <input type="checkbox"/> Inorganic Carbon	415.1	9060	
Oil & Grease	413.1	9070	
<input type="checkbox"/> pH <input type="checkbox"/> pH; paper	150.1	9040B 9041A	
Petroleum Hydrocarbons, Total Recoverable	418.1		
Phenol	420.1	420.2 9065 9066	
<input type="checkbox"/> Ortho <input type="checkbox"/> Total Phosphate	365.2		4500-P B C 210A (a) 2520 (b)
Salinity			
Settleable Solids	160.5		
Sulfide	376.1		9030B/9034 (acid soluble)
Reactive <input type="checkbox"/> Cyanide <input type="checkbox"/> Sulfide		Section 7.3 (9014 9030B)	
Silica	370.1		
Sulfite	377.1		
Sulfate	375.4	9038	
Specific Conductance	120.1	9050A	
Specific Gravity			D5057-90 213E (a)
Synthetic Precipitation Leach		1312	
Total <input checked="" type="checkbox"/> Dissolved <input type="checkbox"/> Suspended <input type="checkbox"/> Solids	160 <input checked="" type="checkbox"/> .1 <input type="checkbox"/> .2 <input type="checkbox"/> .3		
Total Organic Halides	450.1	<input checked="" type="checkbox"/> 9020B	
Turbidity	180.1		
Volatile Solids:			
<input type="checkbox"/> Total <input type="checkbox"/> Dissolved <input type="checkbox"/> Suspended	160.4		
Other:		Method:	

Lionville Laboratory Incorporated

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, Inc.

INORGANICS DATA SUMMARY REPORT 05/02/04

CLIENT: TNUHANFORD B03-018 H2550
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0404L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
-001	B18V41	Alkalinity	136	MG/L	2.0	1.0
		Chloride by IC	23.8	MG/L	1.2	5.0
		Fluoride by IC	0.29	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	122	MG/L	5.00	20.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	31.5	MG/L	1.2	5.0
		Nitrate Nitrite	32.4	MG/L	1.0	50.0
		Total Dissolved Solids	438	MG/L	5.00	1.0
		Total Organic Halides	5.2 u	UG/L	5.2	1.0
-003	B18V43	Alkalinity	141	MG/L	2.0	1.0
		Chloride by IC	24.3	MG/L	1.2	5.0
		Fluoride by IC	0.33	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	128	MG/L	5.00	20.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	32.4	MG/L	1.2	5.0
		Nitrate Nitrite	26.0	MG/L	1.0	50.0
		Total Dissolved Solids	442	MG/L	5.00	1.0
		Total Organic Halides	6.4	UG/L	5.2	1.0
-005	B18V45	Alkalinity	0.50 u	MG/L	0.50	1.0
		Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
		Nitrate Nitrite	0.020u	MG/L	0.020	1.0
		Total Dissolved Solids	5.00 u	MG/L	5.00	1.0
		Total Organic Halides	5.2 u	UG/L	5.2	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/02/04

CLIENT: TNUHANFORD B03-018 H2550
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0404L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
BLANK10	04LAK010-MB1	Alkalinity	0.50 u	MG/L	0.50	1.0
BLANK10	04LICA21-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	04LN3023-MB1	Nitrate Nitrite	0.020u	MG/L	0.020	1.0
BLANK10	04LSS065-MB1	Total Dissolved Solids	5.00 u	MG/L	5.00	1.0
BLANK1	04LX009-MB1	Total Organic Halides	5.2 u	UG/L	5.2	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/02/04

CLIENT: TNUHANFORD B03-018 H2550
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0404L224

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
=====	=====	=====	=====	=====	=====	=====	=====
-001	B18V41	Chloride by IC	77.0	23.8	50.0	106.6	10.0
		Fluoride by IC	5.6	0.29	5.0	105.4	1.0
		Nitrite by IC	5.62	0.25u	5.00	112.3	1.0
		Nitrate by IC	374	122	250	100.9	50.0
		Phosphate by IC	5.4	0.25u	5.0	108.8	1.0
		Sulfate by IC	84.7	31.5	50.0	106.5	10.0
-003	B18V43	Nitrate Nitrite	75.1	26.0	50.0	98.2	100
		Total Organic Halides	54.2	6.4	50.0	95.6	1.0
BLANK10	04LAK010-MB1	Alkalinity	106	0.50u	100	106.3	1.0
		Alkalinity MSD	107	0.50u	100	107.4	1.0
BLANK10	04LICA21-MB1	Chloride by IC	4.8	0.25u	5.0	95.7	1.0
		Fluoride by IC	4.9	0.25u	5.0	97.5	1.0
		Nitrite by IC	4.72	0.25u	5.00	94.4	1.0
		Nitrate by IC	5.11	0.25u	5.00	102.2	1.0
		Phosphate by IC	4.9	0.25u	5.0	97.5	1.0
		Sulfate by IC	4.9	0.25u	5.0	98.6	1.0
BLANK10	04LN3023-MB1	Nitrate Nitrite	0.48	0.02u	0.50	96.8	1.0
BLANK10	04LSS065-MB1	Total Dissolved Solids	95.0	5.00u	100	95.0	1.0
		Total Dissolved Solids	91.0	5.00u	100	91.0	1.0
LCS1	04LX009-LC1	Total Organic Halides	46.7	5.2 u	50.0	93.5	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 05/02/04

CLIENT: TNUHANFORD B03-018 H2550
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0404L224

SAMPLE	SITE ID	ANALYTE	SPIKE#1	SPIKE#2	%DIFF
			%RECOV	%RECOV	
BLANK10	04LAK010-MB1	Alkalinity	106.3	107.4	1.0
BLANK10	04LSS065-MB1	Total Dissolved Solids	95.0	91.0	4.3

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/02/04

CLIENT: TNUHANFORD B03-018 H2550
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0404L224

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION
			RESULT	REPLICATE RPD		FACTOR (REP)
-001REP	B18V41	Alkalinity	136	134	1.6	1.0
		Chloride by IC	23.8	23.8	0.35	5.0
		Fluoride by IC	0.29	0.28	3.6	1.0
		Nitrite by IC	0.25u	0.25u	NC	1.0
		Nitrate by IC	122	131	7.5	20.0
		Phosphate by IC	0.25u	0.25u	NC	1.0
		Sulfate by IC	31.5	31.6	0.48	5.0
		Total Organic Halides	5.2 u	5.4	NC	1.0
-003REP	B18V43	Nitrate Nitrite	26.0	28.6	9.7	50.0
-005REP	B18V45	Total Dissolved Solids	5.00u	5.00u	NC	1.0

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #

Page 1 of 2

PNNL SDG # 142550

Collector **F. M. HALL**
 Telephone No. **502-376-5056**
 MSIN
 Purchase Order/Charge Code
 Ice Chest No. **SAWS-101**
 Temp.
 Bill of Lading/Air Bill No. **7911 9760 6964**
 Offsite Property No.
 Total Activity Exemption: Yes No

SPECIAL INSTRUCTIONS Hold Time
TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
 Batch all PNNL GW samples submitted under "104" SAF's into one SDG, not to exceed SDG closure of 14 days.
 Submit invoices & deliverables to DL Stewart, PNNL.

Sample No.	Lab ID	Date	Time	No/Type Container	Sample Analysis	Preservative
B18V41		3-31-04	1300	3x40-ml aGs*	VOA - 8260A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B18V41				1x500-ml P	ICP Metals - 6010TR (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)	HNO3 to pH <2
B18V41				1x500-ml P	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)	Cool 4C
B18V41				1x250-ml P	Alkalinity - 310.1	Cool 4C
B18V41				1x500-ml P	NO2/NO3 - 353.2	H2SO4 to pH <2 Cool 4C
B18V41				1x20-ml P	Activity Scan	None
B18V41				2x1000-ml P	Gross Alpha; Gross Beta	HNO3 to pH <2
B18V41				1x125-ml P	Carbon-14	None
B18V41				4x1000-ml P	Iodine-129	None
B18V41				2x1000-ml P	Radium -226	HNO3 to pH <2
B18V41				1x250-ml P	Technetium-99	HCl to pH <2
B18V41				1x125-ml P	Total Uranium	HNO3 to pH <2

Relinquished By **F. M. HALL** Date/Time **MAR 31 2004** 1300
 Relinquished By **F. M. Hall** Date/Time **04/10/04 9:30 AM**
 Relinquished By **Fred Ex** Date/Time **4/10/04 3:00 PM**
 Relinquished By **Fred Ex** Date/Time **4-2-04 0945**

Received By **Fred Ex** Date/Time
 Received By **Fred Ex** Date/Time **4/10/04 10:45 AM**
 Received By **Fred Ex** Date/Time
 Received By **Fred Ex** Date/Time

Disposed By **Fred Ex** Date/Time **4-2-04 10945**

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process)

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

PNNL SDG # H2550

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **104-028-10**
Page **1** of **2**

Collector F. M. HALL	Contact/Requester DL STEWART	Telephone No. 509-376-5056	MSIN	FAX
SAF No. 49 11104 B03-018	Sampling Origin HANEFORD SITE	Purchase Order/Charge Code		
Project Title ERDF MARCH 2004	Logbook No. DTS-5AWS-H 400	Ice Chest No. 5AWS-101	Temp.	
Shipped To (Lab) TMA/RFCRA	Method of Shipment GOV. VEHICLE	Bill of Lading/Air Bill No. 79119760 6964		
Protocol CERCLA	Data Turnaround 45 Days	Offsite Property No.		

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
POSSIBLE SAMPLE HAZARDS/REMARKS
 ** **
 TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
 Batch all PNNL GW samples submitted under "104" SAF's into one SDG, not to exceed SDG closure of 14 days.
 Submit invoices & deliverables to DL Stewart, PNNL

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B18V43		W	3-31-04	1300	3x40-mL aGs*	VOA - 8260A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B18V43		W			1x500-mL P	ICP Metals - 6010TR (Client List) (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)	HNO3 to pH <2
B18V43		W			1x500-mL P	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)	Cool 4C
B18V43		W			1x250-mL P	Alkalinity - 310.1	Cool 4C
B18V43		W			1x500-mL P	NO2/NO3 - 353.2	H2SO4 to pH <2 Cool 4C
B18V43		W			1x20-mL P	Activity Scan	None
B18V43		W			2x1000-mL P	Gross Alpha; Gross Beta	HNO3 to pH <2
B18V43		W			1x125-mL P	Carbon-14	None
B18V43		W			4x1000-mL P	Iodine-129	None
B18V43		W			2x1000-mL P	Radium -226	HNO3 to pH <2
B18V43		W			1x250-mL P	Technetium-99	HCl to pH <2
B18V43		W			1x125-mL P	Total Uranium	HNO3 to pH <2

Relinquished By F. M. HALL	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time MAR 31 2004	Received By Fred Ex	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 4/10/04 10:45 AM	Matrix * S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquid T = Tissue WI = Waste L = Liquid V = Vegetation X = Other
Relinquished By Fred Ex	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 4/10/04 9:30 AM	Received By Fred Stewart	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 4/10/04 10:45 AM	
Relinquished By Fred Stewart	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 4/10/04 3:00 PM	Received By Fred Ex	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 4/10/04 10:45 AM	
Relinquished By Fred Ex	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 4-20-04 09:45	Received By DL Stewart	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 4-20-04 09:45	

FINAL SAMPLE DISPOSITION Disposed Method (e.g., Return to customer, per lab procedure, used in process) Disposed By **DL Stewart** Date/Time **4-20-04 09:45**

PNNL SDG # H2550

C.O.C. # 104-028-10

Page 2 of 2

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

SAF No. 494-028	by 4/1/04	LAB - 018	Contact/Requestor DL STEWART	Telephone No. 509-376-5056	MSIN	FAX
Sample No. B18V43	Lab ID W	Date 3-31-04	Time 1300	No/Type Container 1x500-ml P	Sample Analysis TDS - 160.1	Preservative Cool 4C
Sample No. B18V43	Lab ID W	Date 4/1/04	Time 1300	No/Type Container 1x500-ml aGs*	Sample Analysis TOX - 9020	Preservative H2SO4 to pH <2 Cool 4C
Sample No. B18V44 (F)	Lab ID W	Date 4/1/04	Time 1300	No/Type Container 1x500-ml P	Sample Analysis ICP Metals - 6010TR (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)	Preservative HNO3 to pH <2

Relinquished By	Print	Signature	Date/Time	Received By	Print	Signature	Date/Time
F. M. HALL		[Signature]	MAR 31 2004	Fee Ex		[Signature]	10:45A
Fee Ex		[Signature]	4/1/04 9:30 AM	Fee Ex		[Signature]	4/1/04
Fee Ex		[Signature]	4/1/04 3:00 PM	Fee Ex		[Signature]	4/1/04
Fee Ex		[Signature]	4/1/04 4:00 PM	Fee Ex		[Signature]	4/1/04

Relinquished By Fee Ex	Print	Signature	Date/Time 4.2.04 10:45	Received By Fee Ex	Print	Signature	Date/Time 4.2.04 10:45
Relinquished By Fee Ex		[Signature]	4.2.04 10:45	Received By Fee Ex		[Signature]	4.2.04 10:45
Relinquished By Fee Ex		[Signature]	4.2.04 10:45	Received By Fee Ex		[Signature]	4.2.04 10:45

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

C.O.C. # **104-028-11**
 Page 1 of 2

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

PNNL SDG # **H2550**

Collector **F. M. HALL** Telephone No. **509-376-5056** MSIN **7911 9760 6927**
 Project Title **ERDE MARCH 2004** Purchase Order/Charge Code
 AF No. **4-1104** Sampling Origin **HANFORD SITE** Ice Chest No. **SAWS - 116A** Temp.
104-028 Logbook No. **SAWS - H 830** Bill of Lading/Air Bill No. **7911 9760 6927**
 Method of Shipment **GOVT. VEHICLE** Offsite Property No.
 Data Turnaround **45 Days**

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
 TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
 Batch all PNNL GW samples submitted under "104" SAF's into one SDG, not to exceed SDG closure of 14 days.
 Submit invoices & deliverables to DL Stewart, PNNL

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B18V45		W	3-31-04	08:20	3x40-mL aGs*	VOA - 8260A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B18V45		W			1x500-mL P	ICP Metals - 6010TR (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)	HNO3 to pH <2
B18V45		W			1x500-mL P	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)	Cool 4C
B18V45		W			1x250-mL P	Alkalinity - 310.1	Cool 4C
B18V45		W			1x500-mL P	NO2/NO3 - 353.2	H2SO4 to pH <2 Cool 4C
B18V45		W			1x20-mL P	Activity Scan	None
B18V45		W			2x1000-mL P	Gross Alpha; Gross Beta	HNO3 to pH <2
B18V45		W			1x125-mL P	Carbon-14	None
B18V45		W			4x1000-mL P	Iodine-129	None
B18V45		W			2x1000-mL P	Radium - 226	HNO3 to pH <2
B18V45		W			1x250-mL P	Technetium-99	HCl to pH <2
B18V45		W			1x125-mL P	Total Uranium	HNO3 to pH <2

Relinquished By **F. M. HALL** Date/Time **1330 MAR 31 2004** Sign **[Signature]** Received By **Fred Ex** Date/Time **4/1/04 12:45** Matrix *
 Relinquished By **Fred Ex** Date/Time **4/1/04 9:30 am** Sign **[Signature]** Received By **Fred Ex** Date/Time **4/1/04 12:45**
 Relinquished By **Fred Ex** Date/Time **4/1/04 3:00pm** Sign **[Signature]** Received By **Fred Ex** Date/Time **4/1/04 12:45**
 Relinquished By **Fred Ex** Date/Time **4-2-04 09:45** Sign **[Signature]** Received By **Fred Ex** Date/Time **4-2-04 09:45**
 FINAL SAMPLE Disposal Method (e.g., Return to customer, per lab procedure, used in process) Date/Time
 Disposed By **[Signature]** Date/Time **4-2-04 09:45**

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.# **104-028-11**
 Page 2 of 2
 MSIN FAX

Telephone No.
 509-376-5056

MSIN

Sample Analysis

Sample No.	Lab ID	Date	Time	No/Type Container	Contact/Requestor	Preservative
B18V45	W	3-31-04	0800	1x500-ml P	DL STEWART	Cool 4C
B18V45	W			1x500-ml aGs*		H2SO4 to pH <2 Cool 4C
B18V46 (F)	W			1x500-ml P		HNO3 to pH <2
ICP Metals - 6010TR (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)						
TDS - 160.1						
TOX - 9020						
3-31-04						

Relinquished By J. M. MALL	Print [Signature]	Sign [Signature]	Date/Time MAR 31 2004 1:30	Received By Fred Ex	Print [Signature]	Sign [Signature]	Date/Time 4/10/04 10:45 AM	Matrix* S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air	Date/Time 4-2-04/0945
Relinquished By Fred Ex	Print [Signature]	Sign [Signature]	Date/Time 4/10/04 9:20 AM	Received By Fred Sarva	Print [Signature]	Sign [Signature]	Date/Time 4/10/04 10:45 AM	Matrix* DS = Drum Solids DL = Drum Liquid T = Tissue WI = Wine L = Liquid V = Vegetation X = Other	Date/Time 4-2-04/0945
Relinquished By APD Sarva	Print [Signature]	Sign [Signature]	Date/Time 3:00 PM	Received By Fred Ex	Print [Signature]	Sign [Signature]	Date/Time 4-2-04/0945	Matrix* S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air	Date/Time 4-2-04/0945
Relinquished By Med Ex	Print [Signature]	Sign [Signature]	Date/Time 4-2-04/0945	Received By [Signature]	Print [Signature]	Sign [Signature]	Date/Time 4-2-04/0945	Matrix* S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air	Date/Time 4-2-04/0945

FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)

SDG # HR550
 Eberline Srvc

CHAIN OF CUSTODY

ORD # R4-04-004

GE 1

04/01/04 13:24:42

WORK ID: SAF# I04-028 SDG H2550

KEEP: 05/16/05 DISP: S

VD: 04/01/04 DUE: 05/16/04

SH	SAMPLE IDENTIFICATION	STORED	TESTS										
			DISPOS	E015	E122	E153	E211	E260	E265	E287			
A-W	B18V41	SCA-2											
B-W	B18V41 MS	SCA-2											
C-W	B18V41 DUP	SCA-2											
4A-W	B18V42 (F)	SCA-2	DISPOS	E015									
5B-W	B18V42 (F) MS	SCA-2											
6C-W	B18V42 (F) DUP	SCA-2											
7A-W	B18V43	SCA-2	DISPOS	E015	E122	E153	E211	E260	E265				
8A-W	B18V44 (F)	SCA-2	DISPOS	E015									
9A-W	B18V45	SCA-2	DISPOS	E015	E122	E153	E211	E260	E265				
10A-W	B18V4 (F)	SCA-2	DISPOS	E015									
11A-W	B18V47	SCA-2	DISPOS	E122									

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
<i>[Signature]</i>	4/1/04	<i>[Signature]</i>	4/1/04	<i>[Signature]</i>	4-2-04
<i>[Signature]</i>	4-2-04				

**Lionville Laboratory Incorporated
SAMPLE RECEIPT CHECKLIST (SRC)**

CLIENT: TNU Hanford

Date: 4-2-04

Purchase Order / Project# /
SAF# / SOW# / Release #:

LvLI Batch # :

Sample Custodian:

04104L224

[Signature]

NOTE: EXPLAIN ALL DISCREPANCIES

- | | | |
|---|---|---|
| 1. Samples Hand Delivered or <u>Shipped</u> | Carrier <u>MedEx</u> | Airbill# <u>7901 0618 8797</u> |
| 2. Custody seals on coolers or shipping container intact, signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals Comments |
| 3. Outside of coolers or shipping containers are free from damage? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 4. All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 5. Samples received: <u>cooled</u> or ambient? | Temp <u>2.4°C</u> | Cooler # <u>SAWS-101</u> |
| 6. Custody seals on sample containers intact, signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals |
| 7. coc signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 8. Sample containers are intact? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 9. All samples on coc received? All samples received on coc? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 10. All sample label information matches coc? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 11. Samples properly preserved? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 12. Samples received within hold times? Short holds taken to wet lab? | <input checked="" type="checkbox"/> Yes
<i>side-04</i> | <input checked="" type="checkbox"/> No
<i>NO2 NO3 PO4 - B18V45 rec'd past hold</i> |
| 13. VOA, TOC, TOX free of headspace? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> N/A |
| 14. QC stickers placed on bottles designated by client? | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 16. Project Manager contacted concerning discrepancies? name/date (or samples outside criteria) | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> No Discrepancies |



EBERLINE

SERVICES



May 24, 2004

Ms. Joan Kessner
Bechtel Hanford Inc.
3190 George Washington Way
MSIN H9-02
Richland, WA 99352

Reference: **P.O. #630**
Eberline Services R4-04-005-7012, SDG H2550

Dear Ms. Kessner:

Enclosed is the data report for three water samples designated under SAF No. B03-018 received at Eberline Services on April 1, 2004. The samples were analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion
Senior Program Manager

MCM/njv

Enclosure: Data Package

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

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H2550 was composed of three water samples designated under SAF No. B03-018 with a Project Title of: ERDF March 2004.

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 BHI via e-fax on May 18, 2004.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.4 Iodine-129 Analyses

No problems were encountered during the course of the analyses.

2.5 Radium-226 Analyses

No problems were encountered during the course of the analyses.

2.6 Total Uranium 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
Senior Program Manager

5/24/4

Date

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2550

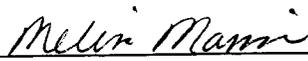
SDG 7012
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2550

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

T A B L E O F C O N T E N T S				
About this section	.	.	.	1
Sample Summaries	.	.	.	3
Prep Batch Summary	.	.	.	5
Work Summary	.	.	.	6
Method Blanks	.	.	.	8
Lab Control Samples	.	.	.	9
Duplicates	.	.	.	10
Matrix Spikes	.	.	.	11
Data Sheets	.	.	.	12
Method Summaries	.	.	.	15
Report Guides	.	.	.	22
End of Section	.	.	.	36


Prepared by


Reviewed by

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 05/18/04

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2550

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
Form DVD-RG
Version 3.06
Report date 05/18/04

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H2550

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 05/18/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
 Contact Melissa C. Mannion

LAB SAMPLE SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG H2550

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R404005-01	B18V41	HANFORD SITE	WATER		B03-018	I04-028-9	03/31/04 13:00
R404005-02	B18V43	HANFORD SITE	WATER		B03-018	I04-028-10	03/31/04 13:00
R404005-03	B18V45	HANFORD SITE	WATER		B03-018	I04-028-11	03/31/04 08:00
R404005-04	Lab Control Sample		WATER		B03-018		
R404005-05	Method Blank		WATER		B03-018		
R404005-06	Duplicate (R404005-01)	HANFORD SITE	WATER		B03-018		03/31/04 13:00
R404005-07	Spike (R404005-01)	HANFORD SITE	WATER		B03-018		03/31/04 13:00

LAB SUMMARY

Page 1

SUMMARY DATA SECTION

Page 3

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LS
 Version 3.06
 Report date 05/18/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
 Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG H2550

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
7012	104-028-10	B18V43	WATER		8.52 L		04/01/04 1	R404005-02	7012-002
	104-028-11	B18V45	WATER		8.52 L		04/01/04 1	R404005-03	7012-003
	104-028-9	B18V41	WATER		8.52 L		04/01/04 1	R404005-01	7012-001
		Method Blank	WATER					R404005-05	7012-005
		Lab Control Sample	WATER					R404005-04	7012-004
		Duplicate (R404005-01)	WATER		8.52 L		04/01/04 1	R404005-06	7012-006
		Spike (R404005-01)	WATER		8.52 L		04/01/04 1	R404005-07	7012-007

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-QS
 Version 3.06
 Report date 05/18/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
 Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
 Contract No. 630
 Case no SDG H2550

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI- FIERS	
			BATCH	2σ %	CLIENT	MORE	RE BLANK	LCS		DUP/ORIG MS/ORIG
Beta Counting										
TC	WATER	Technetium 99 in Water	7084-172	10.0	3		1	1	1/1	
Gas Proportional Counting										
93A	WATER	Gross Alpha in Water	7084-172	20.0	3		1	1	1/1	
93B	WATER	Gross Beta in Water	7084-172	15.0	3		1	1	1/1	
Gamma Spectroscopy										
I	WATER	Iodine 129 in Water	7084-172	5.0	3		1	1	1/1	
Kinetic Phosphorimetry (KPA)										
U_I	WATER	Uranium, Total in Water	7084-172	9.0	3		1	1	1/1	
Liquid Scintillation Counting										
C	WATER	Carbon 14 in Water	7084-172	10.0	3		1	1	1/1	1/1 X
Radon Counting										
RA	WATER	Radium 226 in Water	7084-172	5.0	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 Hanford
 Version Ver 1.0
 Form DVD-PBS
 Version 3.06
 Report date 05/18/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2550

LAB WORK SUMMARY

SDG 7012
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2550

LAB SAMPLE	CLIENT SAMPLE ID					SUF-				
COLLECTED	LOCATION		MATRIX			FIX	ANALYZED	REVIEWED	BY	METHOD
RECEIVED	CUSTODY	SAF No		PLANCHET	TEST					
R404005-01	B18V41			7012-001	93A/93		05/07/04	05/13/04	MWT	Gross Alpha in Water
03/31/04	HANFORD SITE		WATER	7012-001	93B/93		05/07/04	05/13/04	MWT	Gross Beta in Water
04/01/04	I04-028-9	B03-018		7012-001	C		04/30/04	05/13/04	MWT	Carbon 14 in Water
				7012-001	I		05/03/04	05/13/04	MWT	Iodine 129 in Water
				7012-001	RA		05/07/04	05/13/04	MWT	Radium 226 in Water
				7012-001	TC		05/08/04	05/13/04	MWT	Technetium 99 in Water
				7012-001	U_T		04/24/04	05/13/04	MWT	Uranium, Total in Water
R404005-02	B18V43			7012-002	93A/93		05/04/04	05/13/04	MWT	Gross Alpha in Water
03/31/04	HANFORD SITE		WATER	7012-002	93B/93		05/04/04	05/13/04	MWT	Gross Beta in Water
04/01/04	I04-028-10	B03-018		7012-002	C		04/30/04	05/13/04	MWT	Carbon 14 in Water
				7012-002	I		05/04/04	05/13/04	MWT	Iodine 129 in Water
				7012-002	RA		05/07/04	05/13/04	MWT	Radium 226 in Water
				7012-002	TC		05/08/04	05/13/04	MWT	Technetium 99 in Water
				7012-002	U_T		04/24/04	05/13/04	MWT	Uranium, Total in Water
R404005-03	B18V45			7012-003	93A/93		05/04/04	05/13/04	MWT	Gross Alpha in Water
03/31/04	HANFORD SITE		WATER	7012-003	93B/93		05/04/04	05/13/04	MWT	Gross Beta in Water
04/01/04	I04-028-11	B03-018		7012-003	C		04/30/04	05/13/04	MWT	Carbon 14 in Water
				7012-003	I		05/05/04	05/13/04	MWT	Iodine 129 in Water
				7012-003	RA		05/07/04	05/13/04	MWT	Radium 226 in Water
				7012-003	TC		05/08/04	05/13/04	MWT	Technetium 99 in Water
				7012-003	U_T		04/24/04	05/13/04	MWT	Uranium, Total in Water
R404005-04	Lab Control Sample			7012-004	93A/93		05/04/04	05/13/04	MWT	Gross Alpha in Water
			WATER	7012-004	93B/93		05/04/04	05/13/04	MWT	Gross Beta in Water
		B03-018		7012-004	C		04/30/04	05/13/04	MWT	Carbon 14 in Water
				7012-004	I		05/05/04	05/13/04	MWT	Iodine 129 in Water
				7012-004	RA		05/07/04	05/13/04	MWT	Radium 226 in Water
				7012-004	TC		05/08/04	05/13/04	MWT	Technetium 99 in Water
				7012-004	U_T		04/24/04	05/13/04	MWT	Uranium, Total in Water
R404005-05	Method Blank			7012-005	93A/93		05/07/04	05/13/04	MWT	Gross Alpha in Water
			WATER	7012-005	93B/93		05/07/04	05/13/04	MWT	Gross Beta in Water
		B03-018		7012-005	C		04/30/04	05/13/04	MWT	Carbon 14 in Water
				7012-005	I		05/06/04	05/13/04	MWT	Iodine 129 in Water
				7012-005	RA		05/07/04	05/13/04	MWT	Radium 226 in Water
				7012-005	TC		05/08/04	05/13/04	MWT	Technetium 99 in Water
				7012-005	U_T		04/24/04	05/13/04	MWT	Uranium, Total in Water

WORK SUMMARY

Page 1

SUMMARY DATA SECTION

Page 6

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 05/18/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H2550

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R404005-06 03/31/04 04/01/04	Duplicate (R404005-01) HANFORD SITE	B03-018	WATER	7012-006 7012-006 7012-006 7012-006 7012-006 7012-006	93A/93 93B/93 C I RA TC U_T		05/07/04 05/07/04 04/30/04 05/06/04 05/07/04 05/11/04 04/24/04	05/13/04 05/13/04 05/13/04 05/13/04 05/13/04 05/13/04 05/13/04	MWT MWT MWT MWT MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Carbon 14 in Water Iodine 129 in Water Radium 226 in Water Technetium 99 in Water Uranium, Total in Water
R404005-07 03/31/04 04/01/04	Spike (R404005-01) HANFORD SITE	B03-018	WATER	7012-007	C		05/01/04	05/13/04	MWT	Carbon 14 in Water

COUNTS OF TESTS BY SAMPLE TYPE											
TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
93A/93	B03-018	Gross Alpha in Water	900.0_ALPHABETA_GPC	3			1	1	1		6
93B/93	B03-018	Gross Beta in Water	900.0_ALPHABETA_GPC	3			1	1	1		6
C	B03-018	Carbon 14 in Water	C14_CHEM_LSC	3			1	1	1	1	7
I	B03-018	Iodine 129 in Water	I129_SEP_LEPS_GS	3			1	1	1		6
RA	B03-018	Radium 226 in Water	903.1_RA226_LUC	3			1	1	1		6
TC	B03-018	Technetium 99 in Water	TC99_TR_SEP_LSC	3			1	1	1		6
U_T	B03-018	Uranium, Total in Water	UTOT_KPA	3			1	1	1		6
TOTALS				21			7	7	7	1	43

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 05/18/04

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2550

7012-005

Method Blank

METHOD BLANK

SDG <u>7012</u>	Client/Case no <u>Hanford</u>	SDG <u>H2550</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R404005-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7012-005</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>B03-018</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.220	0.71	1.7	3.0	U	93A
Gross Beta	12587-47-2	-0.180	2.2	3.8	4.0	U	93B
Carbon 14	14762-75-5	-19.3	24	40	200	U	C
Technetium 99	14133-76-7	1.92	3.0	5.4	15	U	TC
Total Uranium (ug/L)	7440-61-1	0	0.007	0.016	0.10	U	U_T
Radium 226	13982-63-3	0.129	0.41	0.75	2.0	U	RA
Iodine 129	15046-84-1	0.335	1.8	4.1	5.0	U	I

ERDF MARCH 2004

QC-BLANK #47193

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>05/18/04</u>

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2550

7012-004

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7012</u>	Client/Case no <u>Hanford</u>	SDG <u>H2550</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R404005-04</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7012-004</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>B03-018</u>	

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	160	11	1.4	3.0	93A	153	6.1	105	66-134	70-130
Gross Beta	166	7.8	3.8	4.0	93B	161	6.4	103	75-125	70-130
Carbon 14	8750	92	40	200	C	9570	380	91	85-115	80-120
Technetium 99	1200	27	5.8	15	TC	1200	48	100	83-117	80-120
Total Uranium (ug/L)	91.0	11	<u>0.16</u>	0.10	U_T	90.5	3.6	101	77-123	80-120
Radium 226	255	6.7	0.75	2.0	RA	308	12	<u>83</u>	91-109	80-120
Iodine 129	532	20	<u>17</u>	5.0	I	508	20	105	89-111	80-120

ERDF MARCH 2004

QC-LCS #47192

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>05/18/04</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2550

7012-006

B18V41

DUPLICATE

SDG <u>7012</u> Contact <u>Melissa C. Mannion</u> DUPLICATE Lab sample id <u>R404005-06</u> Dept sample id <u>7012-006</u>	ORIGINAL Lab sample id <u>R404005-01</u> Dept sample id <u>7012-001</u> Received <u>04/01/04</u>	Client/Case no <u>Hanford</u> SDG <u>H2550</u> Contract <u>No. 630</u> Client sample id <u>B18V41</u> Location/Matrix <u>HANFORD SITE</u> <u>WATER</u> Collected/Volume <u>03/31/04 13:00</u> <u>8.52 L</u> Custody/SAF No <u>I04-028-9</u> <u>B03-018</u>
--	---	---

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Gross Alpha	2.67	1.6	1.5	3.0		93A	1.52	1.3	1.2		55	154	
Gross Beta	42.3	2.8	2.0	4.0		93B	36.2	2.6	1.8		16	35	
Carbon 14	6.95	24	40	200	U	C	9.75	23	39	U	-		
Technetium 99	59.2	4.8	5.9	15		TC	66.7	4.3	3.6		12	26	
Total Uranium (ug/L)	2.77	0.30	0.016	0.10		U_T	2.80	0.31	0.016		1	30	
Radium 226	0.361	0.49	0.83	2.0	U	RA	0.265	0.50	0.88	U	-		
Iodine 129	1.77	1.3	2.9	5.0	U	I	2.44	1.7	3.8	U	-		

ERDF MARCH 2004

QC-DUP#1 47194

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>05/18/04</u>

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2550

7012-007

B18V41

MATRIX SPIKE

SDG <u>7012</u>		Client/Case no <u>Hanford</u>	<u>SDG H2550</u>
Contact <u>Melissa C. Mannion</u>		Contract <u>No. 630</u>	
MATRIX SPIKE	ORIGINAL		
Lab sample id <u>R404005-07</u>	Lab sample id <u>R404005-01</u>	Client sample id <u>B18V41</u>	
Dept sample id <u>7012-007</u>	Dept sample id <u>7012-001</u>	Location/Matrix <u>HANFORD SITE</u>	<u>WATER</u>
	Received <u>04/01/04</u>	Collected/Volume <u>03/31/04 13:00</u>	<u>8.52 L</u>
		Custody/SAF No <u>104-028-9</u>	<u>B03-018</u>

ANALYTE	SPIKE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	ORIGINAL pCi/L	2σ ERR (COUNT)	REC 3σ % (TOTAL)	LMTS	PROTOCOL LIMITS
Carbon 14	52600	530	120	200	X	C	52600	2100	9.75	23	100	84-116	60-140

ERDF MARCH 2004

QC-MS#1 47195

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2550

7012-001

B18V41

D A T A S H E E T

SDG <u>7012</u>	Client/Case no <u>Hanford</u>	SDG <u>H2550</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R404005-01</u>	Client sample id <u>B18V41</u>	
Dept sample id <u>7012-001</u>	Location/Matrix <u>HANFORD SITE</u>	<u>WATER</u>
Received <u>04/01/04</u>	Collected/Volume <u>03/31/04 13:00</u>	<u>8.52 L</u>
	Custody/SAF No <u>I04-028-9</u>	<u>B03-018</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	1.52	1.3	1.2	3.0		93A
Gross Beta	12587-47-2	36.2	2.6	1.8	4.0		93B
Carbon 14	14762-75-5	9.75	23	39	200	U	C
Technetium 99	14133-76-7	66.7	4.3	3.6	15		TC
Total Uranium (ug/L)	7440-61-1	2.80	0.31	0.016	0.10		U_T
Radium 226	13982-63-3	0.265	0.50	0.88	2.0	U	RA
Iodine 129	15046-84-1	2.44	1.7	3.8	5.0	U	I

ERDF MARCH 2004

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>05/18/04</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2550

7012-002

B18V43

DATA SHEET

SDG <u>7012</u>	Client/Case no <u>Hanford</u>	SDG <u>H2550</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R404005-02</u>	Client sample id <u>B18V43</u>	
Dept sample id <u>7012-002</u>	Location/Matrix <u>HANFORD SITE</u>	<u>WATER</u>
Received <u>04/01/04</u>	Collected/Volume <u>03/31/04 13:00</u>	<u>8.52 L</u>
	Custody/SAF No <u>I04-028-10</u>	<u>B03-018</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	2.13	1.5	1.4	3.0		93A
Gross Beta	12587-47-2	41.3	2.8	2.0	4.0		93B
Carbon 14	14762-75-5	-12.4	23	39	200	U	C
Technetium 99	14133-76-7	68.1	4.2	3.7	15		TC
Total Uranium (ug/L)	7440-61-1	3.07	0.34	0.016	0.10		U_T
Radium 226	13982-63-3	0.411	0.54	0.90	2.0	U	RA
Iodine 129	15046-84-1	1.64	1.6	3.6	5.0	U	I

ERDF MARCH 2004

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>05/18/04</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2550

7012-003

B18V45

D A T A S H E E T

SDG <u>7012</u>	Client/Case no <u>Hanford</u>	SDG <u>H2550</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R404005-03</u>	Client sample id <u>B18V45</u>	
Dept sample id <u>7012-003</u>	Location/Matrix <u>HANFORD SITE</u>	<u>WATER</u>
Received <u>04/01/04</u>	Collected/Volume <u>03/31/04 08:00</u>	<u>8.52 L</u>
	Custody/SAF No <u>I04-028-11</u>	<u>B03-018</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.092	0.36	0.77	3.0	U	93A
Gross Beta	12587-47-2	-1.22	1.7	3.0	4.0	U	93B
Carbon 14	14762-75-5	-14.2	23	39	200	U	C
Technetium 99	14133-76-7	3.31	3.6	3.5	15	U	TC
Total Uranium (ug/L)	7440-61-1	0	0.007	0.016	0.10	U	U_T
Radium 226	13982-63-3	0.542	0.60	0.97	2.0	U	RA
Iodine 129	15046-84-1	-0.126	1.7	3.8	5.0	U	I

ERDF MARCH 2004

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>05/18/04</u>

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H2550

Test TC Matrix WATER
SDG 7012
Contact Melissa C. Mannion

LAB METHOD SUMMARY
TECHNETIUM 99 IN WATER
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2550

RESULTS

LAB	RAW	SUF-			Technetium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT	SAMPLE ID	99
Preparation batch 7084-172					
R404005-01		7012-001	B18V41		66.7
R404005-02		7012-002	B18V43		68.1
R404005-03		7012-003	B18V45		U
R404005-04		7012-004	LCS (QC ID=47192)		ok
R404005-05		7012-005	BLK (QC ID=47193)		U
R404005-06		7012-006	Duplicate (R404005-01)		ok

Nominal values and limits from method RDLs (pCi/L) 15
ERDF MARCH 2004

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7084-172 2σ prep error 10.0 % Reference Lab Notebook 7084 pg. 172															
R404005-01		B18V41	3.6	0.100			94		100			38	05/05/04	05/08	GRB-222
R404005-02		B18V43	3.7	0.100			95		100			38	05/05/04	05/08	GRB-223
R404005-03		B18V45	3.5	0.100			98		100			38	05/05/04	05/08	GRB-224
R404005-04		LCS (QC ID=47192)	5.8	0.100			96		50				05/05/04	05/08	GRB-229
R404005-05		BLK (QC ID=47193)	5.4	0.100			95		50				05/05/04	05/08	GRB-230
R404005-06		Duplicate (R404005-01)	5.9	0.100			88		50			41	05/05/04	05/11	GRB-217
		(QC ID=47194)													

Nominal values and limits from method 15 0.100 20-105 50 180

PROCEDURES REFERENCE TC99_TR_SEP_LSC
CP-430 Technetium-99 Purification (Water) by Extraction Chromatography, rev 0
CP-008 Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD MDA 4.6 ± 2.3
FOR 6 SAMPLES YIELD 94 ± 7

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 05/18/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2550

LAB METHOD SUMMARY

GROSS ALPHA IN WATER

GAS PROPORTIONAL COUNTING

Test 93A Matrix WATER
 SDG 7012
 Contact Melissa C. Mannion

Client Hanford
 Contract No. 630
 Contract SDG H2550

RESULTS

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT	SAMPLE ID	Gross Alpha
Preparation batch 7084-172					
R404005-01	93	7012-001	B18V41		1.52
R404005-02	93	7012-002	B18V43		2.13
R404005-03	93	7012-003	B18V45		U
R404005-04	93	7012-004	LCS (QC ID=47192)		ok
R404005-05	93	7012-005	BLK (QC ID=47193)		U
R404005-06	93	7012-006	Duplicate (R404005-01)		ok

Nominal values and limits from method RDLs (pCi/L) 3.0
 ERDF MARCH 2004

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	RESID	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-			
SAMPLE ID	TEST FIX	CLIENT	SAMPLE ID	pCi/L	L	FAC	TION	mg	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7084-172 2σ prep error 20.0 % Reference Lab Notebook 7084 pg. 172																
R404005-01	93	B18V41		1.2	0.300			73	100			37	05/03/04	05/07		GRB-101
R404005-02	93	B18V43		1.4	0.300			75	100			34	05/03/04	05/04		GRB-105
R404005-03	93	B18V45		0.77	0.300			<u>0</u>	100			34	05/03/04	05/04		GRB-108
R404005-04	93	LCS (QC ID=47192)		1.4	0.140			20	100				05/03/04	05/04		GRB-109
R404005-05	93	BLK (QC ID=47193)		1.7	0.140			19	100				05/03/04	05/07		GRB-102
R404005-06	93	Duplicate (R404005-01)		1.5	0.300			74	100			37	05/03/04	05/07		GRB-105
		(QC ID=47194)														

Nominal values and limits from method 3.0 0.140 5-250 100 180

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
 CP-120 Gross Alpha and Gross Beta in Water, rev 5

AVERAGES ± 2 SD MDA 1.3 ± 0.64
 FOR 6 SAMPLES RESIDUE 44 ± 68

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 05/18/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2550

LAB METHOD SUMMARY

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

Test 93B Matrix WATER
SDG 7012
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG H2550

RESULTS

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID		Gross Beta
Preparation batch 7084-172					
R404005-01	93	7012-001	B18V41		36.2
R404005-02	93	7012-002	B18V43		41.3
R404005-03	93	7012-003	B18V45		U
R404005-04	93	7012-004	LCS (QC ID=47192)		ok
R404005-05	93	7012-005	BLK (QC ID=47193)		U
R404005-06	93	7012-006	Duplicate (R404005-01)		ok

Nominal values and limits from method RDLs (pCi/L) 4.0
ERDF MARCH 2004

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	RESID	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	mg	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR
Preparation batch 7084-172 2σ prep error 15.0 % Reference Lab Notebook 7084 pg. 172													
R404005-01	93	B18V41	1.8	0.300			73	100	37	05/03/04	05/07	GRB-101	
R404005-02	93	B18V43	2.0	0.300			75	100	34	05/03/04	05/04	GRB-105	
R404005-03	93	B18V45	3.0	0.300			<u>0</u>	100	34	05/03/04	05/04	GRB-108	
R404005-04	93	LCS (QC ID=47192)	3.8	0.140			20	100		05/03/04	05/04	GRB-109	
R404005-05	93	BLK (QC ID=47193)	3.8	0.140			19	100		05/03/04	05/07	GRB-102	
R404005-06	93	Duplicate (R404005-01) (QC ID=47194)	2.0	0.300			74	100	37	05/03/04	05/07	GRB-105	

Nominal values and limits from method 4.0 0.140 5-250 100 180

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
CP-120 Gross Alpha and Gross Beta in Water, rev 5

AVERAGES ± 2 SD MDA 2.7 ± 1.9
FOR 6 SAMPLES RESIDUE 44 ± 68

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 05/18/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2550

Test 1 Matrix WATER
 SDG 7012
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

IODINE 129 IN WATER
 GAMMA SPECTROSCOPY

Client Hanford
 Contract No. 630
 Contract SDG H2550

RESULTS

LAB	RAW	SUF-		
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Iodine 129
Preparation batch 7084-172				
R404005-01		7012-001	B18V41	U
R404005-02		7012-002	B18V43	U
R404005-03		7012-003	B18V45	U
R404005-04		7012-004	LCS (QC ID=47192)	ok
R404005-05		7012-005	BLK (QC ID=47193)	U
R404005-06		7012-006	Duplicate (R404005-01)	- U

Nominal values and limits from method RDLs (pCi/L) 5.0
 ERDF MARCH 2004

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED DETECTOR
Preparation batch 7084-172 2σ prep error 5.0 % Reference Lab Notebook 7084 pg. 172													
R404005-01		B18V41	3.8	0.250			60	1314			33	04/30/04	05/03 XSPEC-004
R404005-02		B18V43	3.6	0.250			78	831			34	04/30/04	05/04 XSPEC-004
R404005-03		B18V45	3.8	0.250			63	1023			35	04/30/04	05/05 XSPEC-004
R404005-04		LCS (QC ID=47192)	<u>17</u>	0.250			90	<u>46</u>				04/30/04	05/05 XSPEC-004
R404005-05		BLK (QC ID=47193)	4.1	0.250			77	551				04/30/04	05/06 XSPEC-004
R404005-06		Duplicate (R404005-01)	2.9	0.250			99	769			36	04/30/04	05/06 XSPEC-004
		(QC ID=47194)											

Nominal values and limits from method 5.0 0.250 20-105 300 100 180

PROCEDURES REFERENCE 1129_SEP_LEPS_GS
 CP-530 Iodine-129 Purification, rev 0

AVERAGES ± 2 SD MDA 5.9 ± 11
 FOR 6 SAMPLES YIELD 78 ± 30

METHOD SUMMARIES

Page 4

SUMMARY DATA SECTION

Page 18

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 05/18/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2550

LAB METHOD SUMMARY

URANIUM, TOTAL IN WATER
KINETIC PHOSPHORIMETRY (KPA)

Test U T Matrix WATER
SDG 7012
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG H2550

RESULTS

LAB	RAW	SUF-		Total	
SAMPLE ID	TEST	FIX	PLANCHET	CLIENT SAMPLE ID	Uranium
Preparation batch 7084-172					
R404005-01			7012-001	B18V41	2.80
R404005-02			7012-002	B18V43	3.07
R404005-03			7012-003	B18V45	U
R404005-04			7012-004	LCS (QC ID=47192)	ok
R404005-05			7012-005	BLK (QC ID=47193)	U
R404005-06			7012-006	Duplicate (R404005-01)	ok

Nominal values and limits from method RDLs (ug/L) 0.10
ERDF MARCH 2004

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-				
SAMPLE ID	TEST	FIX	CLIENT	SAMPLE ID	ug/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7084-172 2σ prep error 9.0 % Reference Lab Notebook 7084 pg. 172																	
R404005-01			B18V41		0.016	0.0200							24	04/24/04	04/24		KPA-001
R404005-02			B18V43		0.016	0.0200							24	04/24/04	04/24		KPA-001
R404005-03			B18V45		0.016	0.0200							24	04/24/04	04/24		KPA-001
R404005-04			LCS (QC ID=47192)		<u>0.16</u>	0.0200								04/24/04	04/24		KPA-001
R404005-05			BLK (QC ID=47193)		0.016	0.0200								04/24/04	04/24		KPA-001
R404005-06			Duplicate (R404005-01)		0.016	0.0200							24	04/24/04	04/24		KPA-001
			(QC ID=47194)														

Nominal values and limits from method 0.10 0.0200 180

PROCEDURES REFERENCE UTOT_KPA
CP-044 Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 4
CP-929 Calibration of the Kinetic Phosphorimeter, rev 6

AVERAGES ± 2 SD MDA 0.040 ± 0.12
FOR 6 SAMPLES YIELD _____ ± _____

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 05/18/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2550

LAB METHOD SUMMARY

CARBON 14 IN WATER

LIQUID SCINTILLATION COUNTING

Test C Matrix WATER
SDG 7012
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Contract SDG H2550

RESULTS

LAB	RAW	SUF-		
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Carbon 14
Preparation batch 7084-172				
R404005-01		7012-001	B18V41	U
R404005-02		7012-002	B18V43	U
R404005-03		7012-003	B18V45	U
R404005-04		7012-004	LCS (QC ID=47192)	ok
R404005-05		7012-005	BLK (QC ID=47192)	U
R404005-06		7012-006	Duplicate (R404005-01)	- U
R404005-07		7012-007	Spike (R404005-01)	ok X

Nominal values and limits from method RDLs (pCi/L) 200
ERDF MARCH 2004

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7084-172			2σ prep error	10.0 %	Reference Lab Notebook 7084 pg. 172										
R404005-01		B18V41	39	0.0300			100	100			30	04/30/04	04/30	LSC-004	
R404005-02		B18V43	39	0.0300			100	100			30	04/30/04	04/30	LSC-004	
R404005-03		B18V45	39	0.0300			100	100			30	04/30/04	04/30	LSC-004	
R404005-04		LCS (QC ID=47192)	40	0.0300			100	97				04/30/04	04/30	LSC-004	
R404005-05		BLK (QC ID=47192)	40	0.0300			100	100				04/30/04	04/30	LSC-004	
R404005-06		Duplicate (R404005-01)	40	0.0300			100	100			30	04/30/04	04/30	LSC-004	
		(QC ID=47192)													
R404005-07		Spike (R404005-01)	120	0.0200			100	25			31	04/30/04	05/01	LSC-004	
		(QC ID=47192)													

Nominal values and limits from method 200 0.0300 50 180

PROCEDURES REFERENCE C14_CHEM_LSC
CP-241 Carbon-14 in Aqueous Samples, rev 4

AVERAGES ± 2 SD MDA 51 ± 61
FOR 7 SAMPLES YIELD 100 ± 0

METHOD SUMMARIES

Page 6

SUMMARY DATA SECTION

Page 20

Lab id EBRLE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 05/18/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2550

Test RA Matrix WATER
 SDG 7012
 Contact Melissa C. Mannion

LAB METHOD SUMMARY

RADIUM 226 IN WATER
 RADON COUNTING

Client Hanford
 Contract No. 630
 Contract SDG H2550

RESULTS

LAB	RAW	SUF-			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID		Radium 226
Preparation batch 7084-172					
R404005-01		7012-001	B18V41		U
R404005-02		7012-002	B18V43		U
R404005-03		7012-003	B18V45		U
R404005-04		7012-004	LCS (QC ID=47192)		<u>LOW</u>
R404005-05		7012-005	BLK (QC ID=47193)		U
R404005-06		7012-006	Duplicate (R404005-01)		- U

Nominal values and limits from method RDLs (pCi/L) 2.0
 ERDF MARCH 2004

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7084-172 2σ prep error 5.0 % Reference Lab Notebook 7084 pg. 172															
R404005-01		B18V41	0.88	0.0400			100	100				37	05/07/04	05/07	RN-014
R404005-02		B18V43	0.90	0.0400			100	100				37	05/07/04	05/07	RN-015
R404005-03		B18V45	0.97	0.0400			100	100				37	05/07/04	05/07	RN-016
R404005-04		LCS (QC ID=47192)	0.75	0.0400			100	113					05/07/04	05/07	RN-014
R404005-05		BLK (QC ID=47193)	0.75	0.0400			100	113					05/07/04	05/07	RN-015
R404005-06		Duplicate (R404005-01)	0.83	0.0400			100	113				37	05/07/04	05/07	RN-016
		(QC ID=47194)													

Nominal values and limits from method 2.0 0.0400 20-105 100 180

PROCEDURES REFERENCE 903.1_RA226_LUC
 CP-881 Radium-226 in Water and Dissolved Samples, rev 0

AVERAGES ± 2 SD MDA 0.85 ± 0.17
 FOR 6 SAMPLES YIELD 100 ± 0

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LMS
 Version 3.06
 Report date 05/18/04

METHOD SUMMARIES

Page 7

SUMMARY DATA SECTION

Page 21

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2550

SAMPLE SUMMARY

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

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

The following notes apply to these reports:

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

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

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

REPORT GUIDES

Page 1

SUMMARY DATA SECTION

Page 22

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/18/04

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 630
 Case no SDG_H2550

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 plachets 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 plachet 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.

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 630
 Case no SDG_H2550

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 Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 05/18/04

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 630
 Case no SDG_H2550

DATA SHEET

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

The following notes apply to this report:

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

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

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

The following qualifiers are defined by the DVD system:

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

REPORT GUIDES

Page 4

SUMMARY DATA SECTION

Page 25

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 05/18/04

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
 Contract No. 630
 Case no SDG_H2550

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.

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 05/18/04

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2550

DATA SHEET

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

REPORT GUIDES

Page 6

SUMMARY DATA SECTION

Page 27

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/18/04

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2550

SDG 7012
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2550

LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

REPORT GUIDES

Page 7

SUMMARY DATA SECTION

Page 28

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/18/04

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 630
 Case no SDG H2550

DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

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

1. A fixed percentage specified in the protocol.

REPORT GUIDES

Page 8

SUMMARY DATA SECTION

Page 29

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 05/18/04

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford
Contract No. 630
Case no SDG H2550

D U P L I C A T E

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

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

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

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

REPORT GUIDES

Page 9

SUMMARY DATA SECTION

Page 30

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/18/04

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
 Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
 Contract No. 630
 Case no SDG H2550

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 Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 05/18/04

REPORT GUIDES

Page 10

SUMMARY DATA SECTION

Page 31

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
Contact Melissa C. Mannion

GUIDE , c o n t .

Client Hanford
Contract No. 630
Case no SDG_H2550

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 Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/18/04

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2550

METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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

REPORT GUIDES

Page 12

SUMMARY DATA SECTION

Page 33

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/18/04

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2550

METHOD SUMMARY

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

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

MDAs are underlined if greater than the printed RDL.

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

REPORT GUIDES

Page 13

SUMMARY DATA SECTION

Page 34

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/18/04

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
 Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
 Contract No. 630
 Case no SDG_H2550

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

Lab id EBRLNE
 Protocol Hanford
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 05/18/04

REPORT GUIDES

Page 14

SUMMARY DATA SECTION

Page 35

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2550

SDG 7012
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2550

METHOD SUMMARY

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

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

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

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

REPORT GUIDES

Page 15

SUMMARY DATA SECTION

Page 36

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/18/04

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

PNNL

Collector F. M. HALL	Contact/Requester DL STEWART	MSIN H2550 (7012)	Telephone No. 509-376-5056	FAX
SAF No. B03-018	Sampling Origin HANFORD SITE	Logbook No. DTS - SAWS - 4830	Ice Chest No. SAWS-101	Temp.
Project Title ERDE MARCH 2004	Method of Shipment GOVT. VEHICLE	Bill of Lading/Air Bill No. 7911 9760 6964	Offsite Property No.	
Shipped To (Lab) TMA/RFCRA	Data Turnaround 45 Days			

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
POSTABLE SAMPLE HAZARDS/REMARKS
 ** **
 TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
 Batch all PNNL GW samples submitted under "104" SAF's into one SDG, not to exceed SDG closure of 14 days.
 Submit invoices & deliverables to DL Stewart, PNNL.

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B18V41		W	3-31-04	1300	3x40-ml aGs*	VOA - 8260A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B18V41		W			1x500-ml P	ICP Metals - 6010TR (Client List) (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)	HNO3 to pH <2
B18V41		W			1x500-ml P	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)	Cool 4C
B18V41		W			1x250-ml P	Alkalinity - 310.1	Cool 4C
B18V41		W			1x500-ml P	NO2/NO3 - 353.2	H2SO4 to pH <2 Cool 4C
B18V41		W			1x20-ml P	Activity Scan	None
B18V41		W			2x1000-ml P	Gross Alpha; Gross Beta	HNO3 to pH <2
B18V41		W			1x125-ml P	Carbon-14	None
B18V41		W			4x1000-ml P	Iodine-129	None
B18V41		W			2x1000-ml P	Radium -226	HNO3 to pH <2
B18V41		W			1x250-ml P	Technetium-99	HCl to pH <2
B18V41		W			1x125-ml P	Total Uranium	HNO3 to pH <2

Relinquished By F. M. HALL	Print	Signature	Date/Time MAR 31 2004	Received By Fred Ex	Print	Signature	Date/Time
Relinquished By Fred Ex	Print	Signature	Date/Time 04/01/04 9:30 AM	Received By Fred Ex	Print	Signature	Date/Time
Relinquished By	Print	Signature	Date/Time	Received By	Print	Signature	Date/Time
Relinquished By	Print	Signature	Date/Time	Received By	Print	Signature	Date/Time

Matrix *

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

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By

Date/Time

Collector **F.M. HALL** Telephone No. **509-376-5056** MSIN **7911 9760 6964**
 SAF No. **803-018** Purchase Order/Charge Code **H2550 (7012)**
 Project Title **ERDF MARCH 2004** Sampling Origin **HANFORD SITE**
 Shipped To (Lab) **TM/RECRA** Logbook No. **DTS-SAWS-H2550** Temp. **10**
 Protocol **CERCLA** Method of Shipment **GOVT. VEHICLE** Bill of Lading/Air Bill No. **7911 9760 6964**
 Offsite Property No.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
 TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
 Batch all PNNL GW samples submitted under "104" SAF's into one SDG, not to exceed SDG closure of 14 days.
 Submit invoices & deliverables to DL Stewart, PNNL

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B18V43		W	3-31-04	1300	3x40-mL aGs*	VOA - 8260A (TCL)	HCl or H2SO4 to pH <2 Cool 4C
B18V43		W			1x500-mL P	ICP Metals - 6010TR (Client List) (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)	HNO3 to pH <2
B18V43		W			1x500-mL P	IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate)	Cool 4C
B18V43		W			1x250-mL P	Alkalinity - 310.1	Cool 4C
B18V43		W			1x500-mL P	NO2/NO3 - 353.2	H2SO4 to pH <2 Cool 4C
B18V43		W			1x20-mL P	Activity Scan	None
B18V43		W			2x1000-mL P	Gross Alpha, Gross Beta	HNO3 to pH <2
B18V43		W			1x125-mL P	Carbon-14	None
B18V43		W			4x1000-mL P	Iodine-129	None
B18V43		W			2x1000-mL P	Radium -226	HNO3 to pH <2
B18V43		W			1x250-mL P	Technetium-99	HCl to pH <2
B18V43		W			1x125-mL P	Total Uranium	HNO3 to pH <2

Relinquished By **F.M. HALL** Date/Time **1550** Received By **Fred Ex** Date/Time **4/1/04** Sign **[Signature]**
 Relinquished By **Fred Ex** Date/Time **4/1/04** Received By **Fred Serrano** Date/Time **4/1/04 10:45 AM** Sign **[Signature]**
 Relinquished By **Fred Ex** Date/Time **4/1/04** Received By **[Signature]** Date/Time **9:30 AM** Sign **[Signature]**
 Relinquished By **[Signature]** Date/Time **[Signature]** Received By **[Signature]** Date/Time **[Signature]** Sign **[Signature]**

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

Disposal Method (e.g. Return to customer, per lab procedure, used in process)
 Disposed By **[Signature]** Date/Time **[Signature]**

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

MW
 4/10/14
H2550 (7012)

Telephone No. **509-376-5056**
 MSIN
 Sample Analysis

Contact/Requestor
DL STEWART

Sample No.	Lab ID	Date	Time	No/Type Container	Sample Analysis	Preservative
B18V45	W	3-31-04	0900	1x500-mL P	TDS - 160.1	Cool 4C
B18V45	W	f	f	1x500-mL aGs*	TOX - 9020	H2SO4 to pH <2 Cool 4C
B18V46 (F)	W	f	f	1x500-mL P	ICP Metals - 6010TR (Arsenic, Barium, Chromium, Lead, Selenium, Tin, Vanadium)	HNO3 to pH <2

Relinquished By F.M. HALL		Date/Time MAR 31 2004	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 4/10/04 10:45 AM	Matrix * S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquid T = Tissue WT = Wine L = Liquid V = Vegetation X = Other
		Date/Time 9:30 a	Print Fed Ex	Sign Fred Sarano	Date/Time 4/10/04	
Relinquished By		Date/Time	Print	Sign	Date/Time	
Relinquished By		Date/Time	Print	Sign	Date/Time	
Relinquished By		Date/Time	Print	Sign	Date/Time	

[Large Signature]
3-31-04



RICHMOND, CA LABORATORY
ICE CHEST RECEIPT LOG

Use one form per shipment. Refer to Thermometer Correction Log for correction factor.

Customer: Fluor Hanford Date: 4/1/04

Ice chest # or description	SAWS 101					
*Ice chest scanned for activity?	/					
Custody seals on ice chest intact?	/					
Custody seals dated?	/					
Custody seals signed?	/					
Thermometer number	6536					
Thermometer: time in	9:30					
Thermometer: time out	10:30					
Thermometer reading	9.0					
Correction factor	0					
** Actual temperature	9°C					
Custody seals on samples?	✓					
Custody seals dated?	/					
Custody seals signed?	/					

* = If activity indicated, perform wipe test and record alpha; beta/gamma reading in cpm.
 ** = Record temperature in degrees Celsius.

Technician: Fluor

Comments: _____



RICHMOND, CA LABORATORY
ICE CHEST RECEIPT LOG

Use one form per shipment. Refer to Thermometer Correction Log for correction factor.

Customer: Plus Newport Date: 4/1/04

Ice chest # or description	<u>GWS 116A</u>					
*Ice chest scanned for activity?	<input checked="" type="checkbox"/>					
Custody seals on ice chest intact?	<input checked="" type="checkbox"/>					
Custody seals dated?	<input checked="" type="checkbox"/>					
Custody seals signed?	<input checked="" type="checkbox"/>					
Thermometer number	<u>2132</u>					
Thermometer: time in	<u>9:30</u>					
Thermometer: time out	<u>10:40</u>					
Thermometer reading	<u>8.0</u>					
Correction factor	<u>+0.3</u>					
**Actual temperature	<u>8.3°C</u>					
Custody seals on samples?	<input checked="" type="checkbox"/>					
Custody seals dated?	<input checked="" type="checkbox"/>					
Custody seals signed?	<input checked="" type="checkbox"/>					

* = If activity indicated, perform wipe test and record alpha; beta/gamma reading in cpm.
 ** = Record temperature in degrees Celsius.

Technician: PSauer

Comments: _____



EBERLINE
SERVICES

RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: Fluor Hanford City Richmond State WA

Date/Time received 4/1/04 9:30 CoC No. F04-028-9, 10, 12, 11

Container I.D. No. GWS-116A
SAWS 101 Requested TAT (Days) 45 P.O. Received Yes [] No []

INSPECTION

1. Custody seals on shipping container intact? Yes [] No [] N/A []
2. Custody seals on shipping container dated & signed? Yes [] No [] N/A []
3. Custody seals on sample containers intact? Yes [] No [] N/A []
4. Custody seals on sample containers dated & signed? Yes [] No [] N/A []
5. Packing material is: Wet [] Dry []
6. Number of samples in shipping container: 7 Sample Matrix W
7. Number of containers per sample: _____ (Or see CoC)
8. Samples are in correct container Yes [] No []
9. Paperwork agrees with samples? Yes [] No []
10. Samples have: Tape [] Hazard labels [] Rad labels [] Appropriate sample labels []
11. Samples are: In good condition [] Leaking [] Broken Container [] Missing []
12. Samples are: Preserved [] Not preserved [] pH 1 Preservative HNO3
13. Describe any anomalies: _____
14. Was P.M. notified of any anomalies? Yes [] No [] Date _____
15. Inspected by J.D. Dow Date: 4/1/04 Time: 10:45 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 _____

Beta/Gamma Meter Ser. No. _____ Calibration date _____