0055849 H1373

JUL 2001 RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-084 H1373

DATE RECEIVED: 06/02/01 LVL LOT # :0106L920

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B120X8						
% SOLIDS	001	S	01L%S068	05/31/01	06/04/01	06/05/01
% SOLIDS	001 REP	S	01L%S068	05/31/01	06/04/01	06/05/01
OIL & GREASE BY GRAV	001	S	01LOG021	05/31/01	06/19/01	06/21/01
OIL AND GREASE BY GR	001 REP	S	01LOG021	05/31/01	06/19/01	06/21/01
OIL AND GREASE BY GR	001 MS	S	01LOG021	05/31/01	06/19/01	06/21/01

LAB QC:

OIL & GREASE BY GRAV	MB1	S	01LOG021	N/A	06/19/01	06/21/01
OIL AND GREASE BY GR	MB1 BS	S	01LOG021	N/A	06/19/01	06/21/01

RECEIVED
NOV 15 2001
EDMC

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-084 H1373
LVL#: 0106L920

W.O.#: 11343-606-001-9999-00
Date Received: 06-02-01

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was 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.

4. The cooler temperature was recorded on the chain of custody.

5. The method blank for Oil and Grease was within the method criteria.

6. The Laboratory Control Sample (LCS) for Oil and Grease was within the laboratory control limits.

7. The matrix spike recovery for Oil and Grease was within the 75-125% control limits.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

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

for

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

06-25-01
Date

njp\i06-920

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 11 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		__ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		✓ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		__ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	

Other: **Method:**

Other: **Method**

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 Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/25/01

CLIENT: TNUHANFORD B01-084 H1373 LVL LOT #: 0106L920

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B120X8	% Solids	97.3	%	0.01	1.0
		Oil & Grease Gravimetri	273	MG/KG	137	1.0

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/25/01

CLIENT: TNUHANFORD B01-084 H1373 LVL LOT #: 0106L920

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LOG021-MB1	Oil & Grease Gravimetri	133	u	MG/KG	133	1.0

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 06/25/01

CLIENT: TNUHANFORD B01-084 H1373 LVL LOT #: 0106L920

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT		SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B120X8	Oil & Grease Gravimetr	6480	273		7070	87.7	1.0
BLANK10	01LOG021-MB1	Oil & Grease Gravimetr	6650	133	u	6880	96.7	1.0

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 06/25/01

CLIENT: TNUHANFORD B01-084 H1373 LVL LOT #: 0106L920

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B120X8	% Solids	97.3	97.2	0.041	1.0
		Oil & Grease Gravimetri	273	245	10.6	1.0

Lionville Laboratory Use Only: 01060L920

Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI LIONVILLE LABORATORIES, INC.

60

Client: TNU-Hanford B01-084
Est. Final Proj. Sampling Date:
Project #: 11343-6006-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 6-2-01 Date Due: 7-2-01

		A	B			C			D							
Refrigerator #		1	4			4			4							
#/Type Container	Liquid															
	Solid	1AG	1AG			1AG			1AG							
Volume	Liquid															
	Solid	250	250			250			500							
Preservatives		-				-			-							
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
Lionville Laboratory Use Only		0624H	0625X			1GGAR			mtl(1)							

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected													
S - Soil	001	B120X8	✓	✓	S	5-31-01	1133	✓	✓			✓			✓					
SE - Sediment																				
SO - Solid																				
SL - Sludge																				
W - Water																				
O - Oil																				
A - Air																				
DS - Drum Solids																				
DL - Drum Liquids																				
L - EP/TCLP Leachate																				
WI - Wipe																				
X - Other																				
F - Fish																				

Special Instructions: SAF B01-084

DATE/REVISIONS:
1. mtl(1) Al, Ag, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K,
2. Mg, Mn, Na, Ni, Sb, V, Zn, Pb, Hg
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill #
Sec Brian
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

Tamper Resistant Seal was
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec'd (Y) or N
Cooler Temp 4.3 C

Relinquished by	Received by	Date	Time
FedEx	TKoppel	6-2-01	1015

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 4837

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-084-04	Page 1 of 1

Collector: Fahlberg	Company Contact: C W Miller	Telephone No.: 372-9274	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: Z-9 Trench Well Deepening and Characterization - Soil	Sampling Location: 200- Z- 9	SAF No.: B01-084	
Ice Chest No.: ERC99-035 (1of1)	Field Logbook No.: EL 1517-1	COA: R20ZP2DP61	Method of Shipment: Fed EX
Shipped To: TMA/RECRA	Offsite Property No.: A010289	Bill of Lading/Air Bill No.: 4235 7954-4837	

POSSIBLE SAMPLE HAZARDS/REMARKS
<2000 pCi/g According to BHI-0150

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None					
Type of Container	aG	aG	aG	aG	aG					
No. of Container(s)	1	1	1	1	1					
Volume	250mL	250mL	250mL	500mL	1000mL					
SAMPLE ANALYSIS	Oil & Grease - 413.1	See item (1) in Special Instructions	VOA - 8260A (TCL)	See item (2) in Special Instructions	See item (3) in Special Instructions RT 5-31-01					

Sample No.	Matrix *	Sample Date	Sample Time										
B120X8	SOIL	5/31/01	1133	X	X	X	X						

CHAIN OF POSSESSION	Sign/Print Names	Received By	Date/Time
Relinquished By: R Fahlberg	Date/Time: 1500 5-31-01	Received By: Stored in Ref 2-C	Date/Time: 5-31-01 1500
Relinquished By: Ref 2C 3728	Date/Time: 0800 6-1-01	Received By: R Thoren	Date/Time: 0800 6-1-01
Relinquished By: R Thoren	Date/Time: 0800 6-1-01	Received By: FED EX	Date/Time:
Relinquished By: FedEx 6-2-01	Date/Time: 1015	Received By: T Kappel 6-2-01	Date/Time: 1015
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS
See SAF Comment Concerning Pu Analysis

(1) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) (Tributyl phosphate)
(2) ICP Metals - 6010A (TAL); ICP Metals - 6010A (Add-on) (Lead); Mercury - 7470 - (CV)
~~(3) Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-on (Antimony-125); Isotopic Plutonium; Americium-241; Neptunium-237; Plutonium-241; Strontium-89,90 -- Total Sr~~

RT 6-1-01

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 5/31/01
Collector not available to relenquish samples on 6/1/01 for shipment.

RT 6-1-01

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

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

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 6-2-01 1015

SDG#: 01061920

Work Order Number: — SAF# B01-0841

Shipping Container ID: EBC99-035 Chain of Custody # B01-0841-04

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 4.3°C
5. Vermiculite/packing materials is Wet [ ] Dry [✓]
6. Number of samples in shipping container: 4
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   ✓ tape ____ hazard labels
   ____ custody seals ____ appropriate sample labels

9. Samples are:
   ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: Thrapp / LVLI Date: 6-2-01

Telephoned to: _____ On _____ By _____

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CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B120X8						
SILVER, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
SILVER, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
SILVER, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
ALUMINUM, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
ALUMINUM, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
ALUMINUM, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
BARIUM, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
BARIUM, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
BARIUM, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
BERYLLIUM, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
BERYLLIUM, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
BERYLLIUM, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
CALCIUM, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
CALCIUM, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
CALCIUM, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
CADMIUM, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
CADMIUM, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
CADMIUM, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
COBALT, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
COBALT, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
COBALT, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
CHROMIUM, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
CHROMIUM, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
CHROMIUM, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
COPPER, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
COPPER, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
COPPER, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
IRON, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
IRON, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
IRON, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
MERCURY, TOTAL	001	S	01C0179	05/31/01	06/19/01	06/20/01
MERCURY, TOTAL	001 REP	S	01C0179	05/31/01	06/19/01	06/20/01
MERCURY, TOTAL	001 MS	S	01C0179	05/31/01	06/19/01	06/20/01
POTASSIUM, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
POTASSIUM, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01

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CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
POTASSIUM, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
MAGNESIUM, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
MAGNESIUM, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
MAGNESIUM, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
MANGANESE, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
MANGANESE, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
MANGANESE, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
SODIUM, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
SODIUM, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
SODIUM, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
NICKEL, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
NICKEL, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
NICKEL, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
LEAD, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
LEAD, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
LEAD, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
ANTIMONY, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
ANTIMONY, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
ANTIMONY, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
VANADIUM, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
VANADIUM, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
VANADIUM, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01
ZINC, TOTAL	001	S	01L0371	05/31/01	06/27/01	06/30/01
ZINC, TOTAL	001 REP	S	01L0371	05/31/01	06/27/01	06/30/01
ZINC, TOTAL	001 MS	S	01L0371	05/31/01	06/27/01	06/30/01

LAB QC:

SILVER LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
SILVER, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
ALUMINUM LABORTORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
ALUMINUM, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
BARIUM LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
BARIUM, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
BERYLLIUM LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
BERYLLIUM, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
CALCIUM LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
CALCIUM, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01

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CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CADMIUM LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
CADMIUM, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
COBALT LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
COBALT, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
CHROMIUM LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
CHROMIUM, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
COPPER LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
COPPER, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
IRON LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
IRON, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
MERCURY LABORATORY	LC1 BS	S	01C0179	N/A	06/19/01	06/20/01
MERCURY, TOTAL	MB1	S	01C0179	N/A	06/19/01	06/20/01
POTASSIUM LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
POTASSIUM, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
MAGNESIUM LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
MAGNESIUM, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
MANGANESE LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
MANGANESE, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
SODIUM LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
SODIUM, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
NICKEL LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
NICKEL, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
LEAD LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
LEAD, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
ANTIMONY LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
ANTIMONY, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
VANADIUM LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
VANADIUM, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01
ZINC LABORATORY	LC1 BS	S	01L0371	N/A	06/27/01	06/30/01
ZINC, TOTAL	MB1	S	01L0371	N/A	06/27/01	06/30/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-084
LVL#: 0106L920
SDG/SAF#: H1373/B01-084

W.O.#: 11343-606-001-9999-00
Date Received: 06-02-01

METALS CASE NARRATIVE

1. This narrative covers the analysis of 1 soil sample.

2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. The cooler temperature has been recorded on the Chain of Custody.

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), MB value less than 5% of the RCRA limit, 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. The matrix spike (MS) recoveries for 4 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B120X5	Aluminum	10,000	106.6
	Antimony	100	110.2
	Chromium	100	111.4
	Iron	10,000	108.7

12. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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

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

for Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

07-03-01
Date

gmb/m05-920

LVLI
LIONVILLE LABORATORY INC.

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0100L920

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	✓6010B		__200.7				__99
Antimony	✓6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	__6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	✓6010B		__200.7				__99
Beryllium	✓6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	✓6010B		__200.7				__99
Cadmium	✓6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	✓6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	✓6010B		__200.7				__99
Copper	✓6010B	__7211 [5]	__200.7	__220.2			__99
Iron	✓6010B		__200.7				__99
Lead	✓6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	✓6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	✓6010B		__200.7				__99
Manganese	✓6010B		__200.7				__99
Mercury	__7470A [3]	✓7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	✓6010B		__200.7				__99
Potassium	✓6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	__6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	✓6010B		__200.7			__1620	__99
Silver	✓6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	✓6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2__200.9			__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	✓6010B		__200.7				__99
Zinc	✓6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

L-WI-033/M-03/01

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

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

Lionville Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/02/01

CLIENT: TNUHANFORD B01-084 H1373 LVL LOT #: 0106L920

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B120X8	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Aluminum, Total	6240	MG/KG	1.3	1.0
		Barium, Total	58.1	MG/KG	0.02	1.0
		Beryllium, Total	0.27	MG/KG	0.02	1.0
		Calcium, Total	2630	MG/KG	0.83	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Cobalt, Total	5.7	MG/KG	0.08	1.0
		Chromium, Total	21.4	MG/KG	0.09	1.0
		Copper, Total	9.9	MG/KG	0.07	1.0
		Iron, Total	14100	MG/KG	1.6	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1440	MG/KG	3.6	1.0
		Magnesium, Total	3710	MG/KG	0.90	1.0
		Manganese, Total	217	MG/KG	0.01	1.0
		Sodium, Total	385	MG/KG	0.17	1.0
		Nickel, Total	17.8	MG/KG	0.12	1.0
		Lead, Total	3.6	MG/KG	0.27	1.0
		Antimony, Total	0.20 u	MG/KG	0.20	1.0
		Vanadium, Total	25.5	MG/KG	0.07	1.0
		Zinc, Total	30.0	MG/KG	0.03	1.0

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/02/01

CLIENT: TNUHANFORD B01-084 H1373 LVL LOT #: 0106L920

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01L0371-MB1	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Aluminum, Total	1.5	MG/KG	1.3	1.0
		Barium, Total	0.03	MG/KG	0.02	1.0
		Beryllium, Total	0.02 u	MG/KG	0.02	1.0
		Calcium, Total	1.8	MG/KG	0.81	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Cobalt, Total	0.08 u	MG/KG	0.08	1.0
		Chromium, Total	0.09 u	MG/KG	0.09	1.0
		Copper, Total	0.07 u	MG/KG	0.07	1.0
		Iron, Total	6.8	MG/KG	1.6	1.0
		Potassium, Total	3.5 u	MG/KG	3.5	1.0
		Magnesium, Total	1.9	MG/KG	0.88	1.0
		Manganese, Total	0.02	MG/KG	0.01	1.0
		Sodium, Total	4.4	MG/KG	0.17	1.0
		Nickel, Total	0.12 u	MG/KG	0.12	1.0
		Lead, Total	0.26 u	MG/KG	0.26	1.0
		Antimony, Total	0.19 u	MG/KG	0.19	1.0
		Vanadium, Total	0.07 u	MG/KG	0.07	1.0
		Zinc, Total	0.03 u	MG/KG	0.03	1.0
BLANK1	01C0179-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 07/02/01

CLIENT: TNUHANFORD B01-084 H1373 LVL LOT #: 0106L920

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B120X8	Silver, Total	4.7	0.10u	5.1	92.2	1.0
		Aluminum, Total	6200	6240	206	-19. *	1.0
		Barium, Total	240	58.1	206	88.6	1.0
		Beryllium, Total	5.0	0.27	5.1	92.8	1.0
		Calcium, Total	5150	2630	2570	98.3	1.0
		Cadmium, Total	4.8	0.03u	5.1	94.1	1.0
		Cobalt, Total	55.0	5.7	51.4	95.9	1.0
		Chromium, Total	50.2	21.4	20.6	139.8	1.0
		Copper, Total	32.5	9.9	25.7	87.9	1.0
		Iron, Total	14100	14100	103	-81. *	1.0
		Mercury, Total	0.18	0.02u	0.17	107.6	1.0
		Potassium, Total	3740	1440	2570	89.3	1.0
		Magnesium, Total	6050	3710	2570	91.1	1.0
		Manganese, Total	274	217	51.4	111.3*	1.0
		Sodium, Total	2760	385	2570	92.5	1.0
		Nickel, Total	72.5	17.8	51.4	106.4	1.0
		Lead, Total	53.3	3.6	51.4	96.7	1.0
		Antimony, Total	36.5	0.20u	51.4	71.0	1.0
		Vanadium, Total	75.2	25.5	51.4	96.7	1.0
		Zinc, Total	79.0	30.0	51.4	95.3	1.0

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 07/02/01

CLIENT: TNUHANFORD B01-084 H1373 LVL LOT #: 0106L920

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B120X8	Silver, Total	0.10u	0.10u	NC	1.0
		Aluminum, Total	6240	6260	0.41	1.0
		Barium, Total	58.1	53.4	8.4	1.0
		Beryllium, Total	0.27	0.26	1.9	1.0
		Calcium, Total	2630	2660	1.3	1.0
		Cadmium, Total	0.03u	0.03u	NC	1.0
		Cobalt, Total	5.7	6.0	5.1	1.0
		Chromium, Total	21.4	31.5	38.2	1.0
		Copper, Total	9.9	9.7	2.0	1.0
		Iron, Total	14100	14400	2.1	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Potassium, Total	1440	1350	6.4	1.0
		Magnesium, Total	3710	3710	0.11	1.0
		Manganese, Total	217	224	3.4	1.0
		Sodium, Total	385	376	2.3	1.0
		Nickel, Total	17.8	23.3	26.8	1.0
		Lead, Total	3.6	3.5	2.8	1.0
		Antimony, Total	0.20u	0.20u	NC	1.0
		Vanadium, Total	25.5	26.0	1.9	1.0
		Zinc, Total	30.0	31.6	5.2	1.0

Lionville Lababoratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/02/01

CLIENT: TNUHANFORD B01-084 H1373 LVL LOT #: 0106L920

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	01L0371-LC1	Silver, LCS	47.5	50.0	MG/KG	95.0
		Aluminum, LCS	494	500	MG/KG	98.8
		Barium, LCS	483	500	MG/KG	96.6
		Beryllium, LCS	23.8	25.0	MG/KG	95.2
		Calcium, LCS	2380	2500	MG/KG	95.3
		Cadmium, LCS	24.0	25.0	MG/KG	96.0
		Cobalt, LCS	244	250	MG/KG	97.4
		Chromium, LCS	48.9	50.0	MG/KG	97.8
		Copper, LCS	122	125	MG/KG	97.6
		Iron, LCS	486	500	MG/KG	97.1
		Potassium, LCS	2550	2500	MG/KG	102.1
		Magnesium, LCS	2440	2500	MG/KG	97.7
		Manganese, LCS	75.4	75.0	MG/KG	100.5
		Sodium, LCS	2440	2500	MG/KG	97.8
		Nickel, LCS	194	200	MG/KG	97.2
		Lead, LCS	243	250	MG/KG	97.0
		Antimony, LCS	289	300	MG/KG	96.2
		Vanadium, LCS	250	250	MG/KG	100.1
		Zinc, LCS	95.2	100	MG/KG	95.2
LCS1	01C0179-LC1	Mercury, LCS	2.7	2.5	MG/KG	107.6

Lionville Laboratory Use Only
01061920

Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI Lionville Laboratory Inc.

Client: TNU-Hanford B01-084

Est. Final Proj. Sampling Date:

Project #: 11343-6060-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 6-6-01 Date Due: 7-2-01

		A	B			C			D							
Refrigerator #		1	4			4			4							
#/Type Container	Liquid															
	Solid	1AG	1AG			1AG			1AG							
Volume	Liquid															
	Solid	250	250			250			500							
Preservatives		-				-			-							
ANALYSES REQUESTED		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
		Lionville Laboratory Use Only														
		0624H	0625X			TOGGR			mtl(1)							

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H	0625X			TOGGR			mtl(1)							
001	B120X8	✓	✓	S	5-31-01	1135	✓	✓			✓			✓							

Special Instructions: SOF B01-084

DATE/REVISIONS:

mtl(1) 1. Al, Ag, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K,
1 2. Mg, Mn, Na, Ni, Sb, V, Zn, Pb, Hg
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered
Airbill #
See Below
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

Tamper Resistant Seal was
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec'd (Y) or N
Cooler Temp 1.3 C

Relinquished by	Received by	Date	Time
FedEx	TKappel	6-6-01	1015

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 4837

13

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-084-04
Collector: Fahlberg	Company Contact: C W Miller	Telephone No.: 372-9274	Project Coordinator: TRENT, SJ	Price Code: 8N	Data Turnaround: 45 Days
Project Designation: Z-9 Trench Well Deepening and Characterization - Soil	Sampling Location: 200- Z- 9		SAF No.: B01-084	Air Quality ☐
Ice Chest No.: ERC99-035 (1 of 1)	Field Logbook No.: EL 1517-1	COA: R20ZP2DP61	Method of Shipment: Fed EX
Shipped To: TMA/RECRA	Offsite Property No.: A010289		Bill of Lading/Air Bill No.: 4235 7454 - 4837

POSSIBLE SAMPLE HAZARDS/REMARKS
<2000 pCi/g According to BHI-6150

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	aG	aG	aG	aG	aG						
No. of Container(s)	1	1	1	1	1						
Volume	250mL	250mL	250mL	500mL	1000mL						
SAMPLE ANALYSIS	Oil & Grease - 413.1	See item (1) in Special Instructions.	VOA - 8260A (TCL)	See item (2) in Special Instructions	See item (3) in Special Instructions RT 5-31-01						

Sample No.	Matrix *	Sample Date	Sample Time										
B120X8	SOIL	5/31/01	1133	X	X	X	X						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: R Fahlberg	Date/Time: 1500 5-31-01	Received By: Storedin Ref 2-C	Date/Time: 5-31-01 1500
Relinquished By: Ref 2C 3728	Date/Time: 0800 6-1-01	Received By: RT Thorer	Date/Time: 0800 6-1-01
Relinquished By: RT Thorer	Date/Time: 0800 6-1-01	Received By: FED EX	Date/Time:
Relinquished By: FedEx 6-2-01	Date/Time: 1015	Received By: T Kappel 6-2-01	Date/Time: 1015
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS
See SAF Comment Concerning Pu Analysis

(1) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) (Tributyl phosphate)
(2) ICP Metals - 6010A (TAL); ICP Metals - 6010A (Add-on) (Lead); Mercury - 7470 - (CV)
~~(3) Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-on (Antimony-125); Isotopic Plutonium; Americium-241; Neptunium-237; Plutonium-241; Strontium-89,90 -- Total Sr~~

RT 6-1-01

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 5/31/01
Collector not available to relenquish samples on 6/1/01 for shipment.

RT 6-1-01

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

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

BHI-EE-011 (10/99)

14

JUL 2001
RECEIVED

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-084 H1373

DATE RECEIVED: 06/02/01 LVL LOT # :0106L920

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B120X8	001	S	01LE0632	05/31/01	06/04/01	06/27/01
B120X8	001 MS	S	01LE0632	05/31/01	06/04/01	06/27/01
B120X8	001 MSD	S	01LE0632	05/31/01	06/04/01	06/28/01

LAB QC:

SBLKXV	MB1	S	01LE0632	N/A	06/04/01	06/05/01
SBLKXV	MB1 BS	S	01LE0632	N/A	06/04/01	06/05/01
SBLKXV	MB1 BSD	S	01LE0632	N/A	06/04/01	06/05/01

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-084
RFW #: 0106L920
SDG/SAF #: H1373/B01-084

W.O. #: 11343-606-001-9999-00
Date Received: 06-02-2001

SEMIVOLATILE

One (1) soil sample was collected on 05-31-2001.

The sample and its associated QC samples were extracted on 06-04-2001 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL and Tributylphosphate Semivolatile target compounds on 06-05,27,28-2001.

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

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The sample was extracted and analyzed within required holding times.

3. Non-target compounds were detected in the sample.

4. All surrogate recoveries were within EPA QC limits.

5. One (1) of twenty-two (22) matrix spike recoveries was outside EPA QC limits.

6. Two (2) of twenty-two (22) blank spike recoveries was outside EPA QC limits.

7. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than the CRQL.

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

9. The method blank analyses were inadvertently not analyzed with a calibration for Tributylphosphate; however, no Tributylphosphate was detected in the sample. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

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

J. Michael Taylor
President
Lionville Laboratory Incorporated

7/4/01
Date

som\gorup\data\bna\tnu-hanford-0106-920.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 1 2 pages.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 01MS231

Initiator: Slayman Batch: 01061920 Parameter: BNA
Date: 6-28-01 Samples: Matrix: Soil
Client: TMI Hanford Method: SW846/MCAWW/CLP/ Prep Batch: 01VE0632

1. Reason for SDR

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

b. General Discrepancy

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

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

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

Blank, BS have several surrogates, spikes low

2. Known or Probable Causes(s) QC has been run several times previously, but not under Tributyl phosphate calibration. Extract volume very low - BS extract was Dry

3. Discussion and Proposed Action

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

Other Description:

Narrate - MS/MSD OK

(report QC from previous calibration w/o TBP)

4. Project Manager Instructions...signature/date: 6/28/01

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

5. Final Action...signature/date: CJT 6/29/01

Other Explanation:

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

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson/Haslett	__	__ GC/LC: Kiger
__	X Technical Mgr: Wesson/Daniels	__	__ MS: Rychlak/Layman
__	X QA (file): Alberts	__	__ Log-in: Keppel
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Beegle/Kiger	__	__ Other: _____

L-WI-006/E-01/01

GLOSSARY OF BNA DATA

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

VLI
DONSVILLE LABORATORY INC

GLOSSARY OF BNA DATA

ABBREVIATIONS

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

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation 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 quantitation modifications:

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

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

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

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

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

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

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List

Report Date: 06/28/01 14:29

RFW Batch Number: **0106L920** Client: **TNUHANFORD B01-084 H1373** Work Order: 11343606001 Page: 1a

	Cust ID:	B120X8		B120X8		B120X8		SBLKXV		SBLKXV BS		SBLKXV BSD	
Sample Information	RFW#:	001		001 MS		001 MSD		01LE0632-MB1		01LE0632-MB1		01LE0632-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	103	%	95	%	90	%	91	%	80	%	83	%
	2-Fluorobiphenyl	98	%	92	%	87	%	93	%	76	%	80	%
	p-Terphenyl-d14	121	%	115	%	112	%	114	%	105	%	99	%
	Phenol-d5	94	%	89	%	82	%	88	%	72	%	80	%
	2-Fluorophenol	90	%	84	%	81	%	84	%	68	%	76	%
	2,4,6-Tribromophenol	105	%	107	%	99	%	103	%	94	%	99	%
		fl		fl		fl		fl		fl		fl	
Phenol		340	U	89	%	85	%	330	U	70	%	79	%
bis(2-Chloroethyl)ether		340	U	340	U	340	U	330	U	330	U	330	U
2-Chlorophenol		340	U	87	%	85	%	330	U	71	%	79	%
1,3-Dichlorobenzene		340	U	340	U	340	U	330	U	330	U	330	U
1,4-Dichlorobenzene		340	U	77	%	75	%	330	U	69	%	77	%
1,2-Dichlorobenzene		340	U	340	U	340	U	330	U	330	U	330	U
2-Methylphenol		340	U	340	U	340	U	330	U	330	U	330	U
2,2'-oxybis(1-Chloropropane)		340	U	340	U	340	U	330	U	330	U	330	U
4-Methylphenol		340	U	340	U	340	U	330	U	330	U	330	U
N-Nitroso-Di-n-propylamine		340	U	94	%	85	%	330	U	91	%	108	%
Hexachloroethane		340	U	340	U	340	U	330	U	330	U	330	U
Nitrobenzene		340	U	340	U	340	U	330	U	330	U	330	U
Isophorone		340	U	340	U	340	U	330	U	330	U	330	U
2-Nitrophenol		340	U	340	U	340	U	330	U	330	U	330	U
2,4-Dimethylphenol		340	U	340	U	340	U	330	U	330	U	330	U
bis(2-Chloroethoxy)methane		340	U	340	U	340	U	330	U	330	U	330	U
2,4-Dichlorophenol		340	U	340	U	340	U	330	U	330	U	330	U
1,2,4-Trichlorobenzene		340	U	84	%	80	%	330	U	76	%	77	%
Naphthalene		340	U	340	U	340	U	330	U	330	U	330	U
4-Chloroaniline		340	U	340	U	340	U	330	U	330	U	330	U
Hexachlorobutadiene		340	U	340	U	340	U	330	U	330	U	330	U
4-Chloro-3-methylphenol		340	U	93	%	89	%	330	U	80	%	83	%
2-Methylnaphthalene		340	U	340	U	340	U	330	U	330	U	330	U
Hexachlorocyclopentadiene		340	U	340	U	340	U	330	U	330	U	330	U
2,4,6-Trichlorophenol		340	U	340	U	340	U	330	U	330	U	330	U
2,4,5-Trichlorophenol		860	U	860	U	860	U	830	U	830	U	830	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0106L920 Client: TNUHANFORD B01-084 H1373 Work Order: 11343606001 Page: 1b

Cust ID:	B120X8		B120X8		B120X8		SBLKXV		SBLKXV BS		SBLKXV BSD	
RFW#:	001		001 MS		001 MSD		01LE0632-MB1		01LE0632-MB1		01LE0632-MB1	
2-Chloronaphthalene	340	U	340	U	340	U	330	U	330	U	330	U
2-Nitroaniline	860	U	860	U	860	U	830	U	830	U	830	U
Dimethylphthalate	340	U	340	U	340	U	330	U	330	U	330	U
Acenaphthylene	340	U	340	U	340	U	330	U	330	U	330	U
2,6-Dinitrotoluene	340	U	340	U	340	U	330	U	330	U	330	U
3-Nitroaniline	860	U	860	U	860	U	830	U	830	U	830	U
Acenaphthene	340	U	91	%	88	%	330	U	80	%	86	%
2,4-Dinitrophenol	860	U	860	U	860	U	830	U	830	U	830	U
4-Nitrophenol	860	U	90	%	80	%	830	U	100	%	110	%
Dibenzofuran	340	U	340	U	340	U	330	U	330	U	330	U
2,4-Dinitrotoluene	340	U	92 *	%	86	%	330	U	86	%	97 *	%
Diethylphthalate	340	U	340	U	340	U	330	U	330	U	330	U
4-Chlorophenyl-phenylether	340	U	340	U	340	U	330	U	330	U	330	U
Fluorene	340	U	340	U	340	U	330	U	330	U	330	U
4-Nitroaniline	860	U	860	U	860	U	830	U	830	U	830	U
4,6-Dinitro-2-methylphenol	860	U	860	U	860	U	830	U	830	U	830	U
N-Nitrosodiphenylamine (1)	340	U	340	U	340	U	330	U	330	U	330	U
4-Bromophenyl-phenylether	340	U	340	U	340	U	330	U	330	U	330	U
Hexachlorobenzene	340	U	340	U	340	U	330	U	330	U	330	U
Pentachlorophenol	860	U	106	%	102	%	830	U	102	%	112 *	%
Phenanthrene	340	U	340	U	340	U	330	U	330	U	330	U
Anthracene	340	U	340	U	340	U	330	U	330	U	330	U
Carbazole	340	U	340	U	340	U	330	U	330	U	330	U
Di-n-Butylphthalate	340	U	340	U	340	U	330	U	330	U	330	U
Fluoranthene	340	U	340	U	340	U	330	U	330	U	330	U
Pyrene	340	U	109	%	113	%	330	U	98	%	96	%
Butylbenzylphthalate	340	U	340	U	340	U	330	U	330	U	330	U
3,3'-Dichlorobenzidine	340	U	340	U	340	U	330	U	330	U	330	U
Benzo(a)anthracene	340	U	340	U	340	U	330	U	330	U	330	U
Chrysene	340	U	340	U	340	U	330	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	60	JB	74	JB	87	JB	47	J	71	JB	39	JB
Di-n-Octyl phthalate	340	U	340	U	340	U	330	U	330	U	330	U
Benzo(b)fluoranthene	340	U	340	U	340	U	330	U	330	U	330	U
Benzo(k)fluoranthene	340	U	340	U	340	U	330	U	330	U	330	U
Benzo(a)pyrene	340	U	340	U	340	U	330	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	340	U	340	U	340	U	330	U	330	U	330	U
Dibenzo(a,h)anthracene	340	U	340	U	340	U	330	U	330	U	330	U
Benzo(g,h,i)perylene	340	U	340	U	340	U	330	U	330	U	330	U
Tributylphosphate	340	U	340	U	340	U	NA		NA		NA	

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

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B120X8

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B01-084 H1373

Matrix: (soil/water) SOIL

Lab Sample ID: 0106L920-001

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D062721

Level: (low/med) LOW

Date Received: 06/02/01

% Moisture: 3 decanted: (Y/N)__

Date Extracted: 06/04/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 06/27/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.780	500	JB
2.	ALKANE	22.466	100	J
3.	ALKANE	23.604	100	J
4.	ALKANE	25.046	90	J
5.	ALKANE	27.028	70	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKXV

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B01-084 H1373

Matrix: (soil/water) SOIL

Lab Sample ID: 01LE0632-MB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: A060503

Level: (low/med) LOW

Date Received: 06/04/01

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

Date Extracted: 06/04/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 06/05/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.986	300	J

10

Lionville Laboratory Use Only
01061920

Custody Transfer Record/Lab Work Request

ALL

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford B01-084
Est. Final Proj. Sampling Date:
Project #: 11343-6060-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 6-2-01 Date Due: 7-2-01

		A	B			C			D							
Refrigerator #		1	4			4			4							
#/Type Container	Liquid															
	Solid	1AG	1AG			1AG			1AG							
Volume	Liquid															
	Solid	250	250			250			500							
Preservatives		-				-			-							
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
		Lionville Laboratory Use Only														
		OLA24H	OLA25X			IOAGR			mr1(1)							

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	OLA24H	OLA25X			IOAGR			mr1(1)							
001	B120X8	✓	✓	S	5-31-01	1133	✓	✓			✓			✓							

Special Instructions: Saf B01-084

DATE/REVISIONS:
mr1(1) 1. Al, Ag, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K,
1 2. Mg, Mn, Na, Ni, Sb, V, Zn, Pb, Hg
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
FedEx	TKappel	6-2-01	1015

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 4837

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # See Below
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

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 4.3 C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-084-04	Page 1 of 1

Collector: Fahlberg	Company Contact: C W Miller	Telephone No.: 372-9274	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: Z-9 Trench Well Deepening and Characterization - Soil	Sampling Location: 200- Z- 9	SAF No.: B01-084	
Ice Chest No.: ERC99 035 (1 of 1)	Field Logbook No.: EL 1517-1	COA: R20ZP2DP61	Method of Shipment: Fed EX
Shipped To: TMA/RECRA	Offsite Property No.: A010289	Bill of Lading/Air Bill No.: 4235 7954-4837	

POSSIBLE SAMPLE HAZARDS/REMARKS
<2000 pCi/g According to BHI-0150

Special Handling and/or Storage

Preservation			Cool 4C	Cool 4C	Cool 4C	Cool 4C	None				
Type of Container			aG	aG	aG	aG	aG				
No. of Container(s)			1	1	1	1	1				
Volume			250mL	250mL	250mL	500mL	1000mL				
SAMPLE ANALYSIS			Oil & Grease - 413.1	See item (1) in Special Instructions	VOA - 8260A (TCL)	See item (2) in Special Instructions	See item (3) in Special Instructions RT 5-31-01				
Sample No.	Matrix *	Sample Date	Sample Time								
B120X8	SOIL	5/31/01	1133	X	X	X	X				

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	R. Fahlberg	5-31-01 1500	Stored in Ref 2-C	5-31-01 1500
Relinquished By	Removed from Ref 2C 3728	6-1-01 0800	R Thorer	6-1-01 0800
Relinquished By	R Thorer	6-1-01 0800	FED EX	
Relinquished By	FedEx	6-2-01 1015	T Kappel	6-2-01 1015
Relinquished By			Received By	
Relinquished By			Received By	

SPECIAL INSTRUCTIONS
See SAF Comment Concerning Pu Analysis

(1) Semi-VOA - 8270A (TCL); Semi-VOA – 8270A (Add-On) (Tributyl phosphate)
(2) ICP Metals - 6010A (TAL); ICP Metals - 6010A (Add-on) (Lead); Mercury - 7470 - (CV)
~~(3) Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-on (Antimony-125); Isotopic Plutonium; Americium-241; Neptunium-237; Plutonium-241; Strontium-89,90 -- Total Sr~~

RT 6-1-01

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 5/31/01
Collector not available to relenquish samples on 6/1/01 for shipment.

RT 6-1-01

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

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

BHI-EE-011 (10/99)

JUL 2001
RECEIVED

Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-084 H1373

DATE RECEIVED: 06/02/01 LVL LOT # :0106L920

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B120X8	001	S	01LXV161	05/31/01	N/A	06/07/01
B120X8	001 MS	S	01LXV161	05/31/01	N/A	06/07/01
B120X8	001 MSD	S	01LXV161	05/31/01	N/A	06/07/01

LAB QC:

VBLKDS	MB1	S	01LXV161	N/A	N/A	06/07/01
VBLKDS	MB1 BS	S	01LXV161	N/A	N/A	06/07/01

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B01-084
RFW #: 0106L920
SDG/SAF #: H1373/B01-084

W.O. #: 11343-606-001-9999-00
Date Received: 06-02-2001

GC/MS VOLATILE

One (1) soil sample was collected on 05-31-2001.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 06-07-2001.

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

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The sample was analyzed within required holding time.
3. Non-target compounds were not detected in the sample.
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 contaminants Methylene Chloride and Acetone at levels less than 3x 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

7/4/01
Date

som\group\data\voa\tnu-hanford\0106-920.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 9 pages.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF VOA DATA

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.

GLOSSARY OF VOA DATA

ABBREVIATIONS

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

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation 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 quantitation modifications:

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

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

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

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

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

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

Lionville Laboratory, Inc.

Volatiles by GC/MS, HSL List

Report Date: 06/29/01 10:50

RFW Batch Number: **0106L920** Client: **TNUHANFORD B01-084 H1373** Work Order: 11343606001 Page: 1a

	Cust ID:	B120X8		B120X8		B120X8		VBLKDS		VBLKDS BS	
Sample Information	RFW#:	001		001 MS		001 MSD		01LXV161-MB1		01LXV161-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Toluene-d8	94	%	90	%	89	%	91	%	89	%
	Bromofluorobenzene	90	%	91	%	88	%	93	%	90	%
	1,2-Dichloroethane-d4	96	%	99	%	94	%	94	%	91	%
Chloromethane		10	U	10	U	10	U	10	U	10	U
Bromomethane		10	U	10	U	10	U	10	U	10	U
Vinyl Chloride		10	U	10	U	10	U	10	U	10	U
Chloroethane		10	U	10	U	10	U	10	U	10	U
Methylene Chloride		26	B	29	B	23	B	12		13	B
Acetone		6	JB	4	JB	5	JB	4	J	10	U
Carbon Disulfide		5	U	5	U	5	U	5	U	5	U
1,1-Dichloroethene		5	U	84	%	86	%	5	U	88	%
1,1-Dichloroethane		5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethene (total)		5	U	5	U	5	U	5	U	5	U
Chloroform		5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethane		5	U	5	U	5	U	5	U	5	U
2-Butanone		10	U	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane		5	U	5	U	5	U	5	U	5	U
Carbon Tetrachloride		5	U	5	U	5	U	5	U	5	U
Bromodichloromethane		5	U	5	U	5	U	5	U	5	U
1,2-Dichloropropane		5	U	5	U	5	U	5	U	5	U
cis-1,3-Dichloropropene		5	U	5	U	5	U	5	U	5	U
Trichloroethene		5	U	94	%	94	%	5	U	93	%
Dibromochloromethane		5	U	5	U	5	U	5	U	5	U
1,1,2-Trichloroethane		5	U	5	U	5	U	5	U	5	U
Benzene		5	U	89	%	88	%	5	U	90	%
Trans-1,3-Dichloropropene		5	U	5	U	5	U	5	U	5	U
Bromoform		5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone		10	U	10	U	10	U	10	U	10	U
2-Hexanone		10	U	10	U	10	U	10	U	10	U
Tetrachloroethene		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
Toluene		5	U	95	%	95	%	5	U	95	%

*= Outside of EPA CLP QC limits.

RFW Batch Number: **0106L920** Client: **TNUHANFORD B01-084 H1373** Work Order: 11343606001 Page: 1b

Cust ID:	B120X8		B120X8		B120X8		VBLKDS		VBLKDS BS	
RFW#:	001		001 MS		001 MSD		01LXV161-MB1		01LXV161-MB1	
Chlorobenzene	5	U	99	%	97	%	5	U	96	%
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.

Lionville Laboratory Use Only
01060L920

Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LVLI

Client: TNU-Hanford B01-084
Est. Final Proj. Sampling Date:
Project #: 11343-6060-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 6-2-01 Date Due: 7-2-01

		A	B			C			D							
Refrigerator #		1	4			4			4							
#/Type Container	Liquid															
	Solid	1AG	1AG			1AG			1AG							
Volume	Liquid															
	Solid	250	250			250			500							
Preservatives		-				-			-							
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
		Lionville Laboratory Use Only														
		06024H	06025X			1060GR			mc1(1)							

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected													
001	B120X8	✓	✓	S	5-31-01	1133	✓	✓			✓			✓					

Special Instructions: SOF B01-084

DATE/REVISIONS:
mc1(1) 1. Al, Ag, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K,
1 2. Mg, Mn, Na, Ni, Sb, V, Zn, Pb, Hg
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
FedEx	TKrippel	6-2-01	1015

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
4235 7954 4837

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or
Hand Delivered
Airbill # See Below
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

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 4.3 C

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-084-04	Page 1 of 1

Collector: Fahlberg	Company Contact: C W Miller	Telephone No.: 372-9274	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: Z-9 Trench Well Deepening and Characterization - Soil	Sampling Location: 200- Z- 9		SAF No.: B01-084
Ice Chest No.: ERC99-035 (1 of 1)	Field Logbook No.: EL 1517-1	COA: R20ZP2DP61	Method of Shipment: Fed EX
Shipped To: TMA/RECRA	Offsite Property No.: A010289		Bill of Lading/Air Bill No.: 4235 7954-4837

POSSIBLE SAMPLE HAZARDS/REMARKS
<2000 pCi/g According to BHI-0150

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	aG	aG	aG	aG	aG						
No. of Container(s)	1	1	1	1	1						
Volume	250mL	250mL	250mL	500mL	1000mL						
SAMPLE ANALYSIS	Oil & Grease - 413.1	See item (1) in Special Instructions	VOA - 8260A (TCL)	See item (2) in Special Instructions	See item (3) in Special Instructions RT 5-31-01						

Sample No.	Matrix *	Sample Date	Sample Time										
B120X8	SOIL	5/31/01	1133	X	X	X	X						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: R Fahlberg	Date/Time: 5-31-01 1500	Received By: Storedin Ref 2-C	Date/Time: 5-31-01 1500
Relinquished By: Removed from Ref 2C 3728	Date/Time: 0800 6-1-01	Received By: R Thoren	Date/Time: 0800 6-1-01
Relinquished By: R Thoren	Date/Time: 0800 6-1-01	Received By: FED EX	Date/Time:
Relinquished By: FedEx	Date/Time: 6-2-01 1015	Received By: T Kepp	Date/Time: 6-2-01 1015
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS
See SAF Comment Concerning Pu Analysis

(1) Semi-VOA - 8270A (TCL); Semi-VOA -- 8270A (Add-On) (Tributyl phosphate)
(2) ICP Metals - 6010A (TAL); ICP Metals - 6010A (Add-on) (Lead); Mercury - 7470 - (CV)
~~(3) Gamma Spectroscopy (Cesium-137, Cobalt-60); Gamma Spec - Add-on (Antimony-125); Isotopic Plutonium; Americium-241; Neptunium-237; Plutonium-241; Strontium-89,90 -- Total Sr~~

RT 6-1-01

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 5/31/01
Collector not available to relenquish samples on 6/1/01 for shipment.

RT 6-1-01

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

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

BHI-EE-011 (10/99)

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1373 was composed of one solid (soil) sample designated under SAF No. B01-084 with a Project Designation of: Z-9 Trench Well Deepening and Characterization – Soil

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

2.0 ANALYSIS NOTES

2.1 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.2 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.3 Plutonium-241 Analyses

All Isotopic Plutonium results were less than 1 pCi/gram. No Pu-241 analyses were performed as per SAF No. B01-084.

2.4 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.5 Neptunium-237 Analyses

All Am-241 results were less than 1 pCi/gram. No Np-237 analyses were performed as per SAF No. B01-084.

2.6 Gamma Spectroscopy 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 Mannion

Melissa C. Mannion
Program Manager

7/18/01

Date

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1373

SDG 7004
Contact Melissa C. Mannion

SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1373

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B120X8	200-Z-9	SOLID		R106020-01	B01-084	B01-084-04	05/31/01 11:33
Method Blank		SOLID		R106020-03	B01-084		
Lab Control Sample		SOLID		R106020-02	B01-084		
Duplicate (R106020-01)	200-Z-9	SOLID		R106020-04	B01-084		05/31/01 11:33

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 07/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1373

SDG 7004
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1373

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7004	B01-084-04	B120X8	SOLID	96.9	1110 g		06/04/01	4	R106020-01	7004-001
		Method Blank	SOLID						R106020-03	7004-003
		Lab Control Sample	SOLID						R106020-02	7004-002
		Duplicate (R106020-01)	SOLID	96.9	1110 g		06/04/01	4	R106020-04	7004-004

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 07/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1373

SDG 7004
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1373

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	6981-202	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6981-202	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6981-202	10.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6981-202	15.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 07/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1373

SDG 7004
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1373

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B120X8			R106020-01	7004-001	AM		06/21/01	07/18/01	MCM	Americium 241 in Soil
200-Z-9		SOLID	05/31/01	7004-001	GAM		06/08/01	07/18/01	MCM	Gamma Scan
B01-084-04	B01-084		06/04/01	7004-001	PU		06/19/01	07/18/01	MCM	Plutonium, Isotopic in Solids
				7004-001	SR		06/08/01	07/18/01	MCM	Total Strontium in Soil
Method Blank			R106020-03	7004-003	AM		06/21/01	07/18/01	MCM	Americium 241 in Soil
		SOLID		7004-003	GAM		06/13/01	07/18/01	MCM	Gamma Scan
	B01-084			7004-003	PU		06/19/01	07/18/01	MCM	Plutonium, Isotopic in Solids
				7004-003	SR		06/08/01	07/18/01	MCM	Total Strontium in Soil
Lab Control Sample			R106020-02	7004-002	AM		06/19/01	07/18/01	MCM	Americium 241 in Soil
		SOLID		7004-002	GAM		06/08/01	07/18/01	MCM	Gamma Scan
	B01-084			7004-002	PU		06/19/01	07/18/01	MCM	Plutonium, Isotopic in Solids
				7004-002	SR		06/08/01	07/18/01	MCM	Total Strontium in Soil
Duplicate (R106020-01)			R106020-04	7004-004	AM		06/19/01	07/18/01	MCM	Americium 241 in Soil
200-Z-9		SOLID	05/31/01	7004-004	GAM		06/13/01	07/18/01	MCM	Gamma Scan
	B01-084		06/04/01	7004-004	PU		06/21/01	07/18/01	MCM	Plutonium, Isotopic in Solids
				7004-004	SR		06/08/01	07/18/01	MCM	Total Strontium in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B01-084	Americium 241 in Soil	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
GAM	B01-084	Gamma Scan	GAMMA_GS	1			1	1	1	4
PU	B01-084	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
SR	B01-084	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TOTALS				4			4	4	4	16

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 07/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1373

R106020-03 Method Blank

METHOD BLANK

SDG	7004	Client/Case no	Hanford	SDG H1373	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R106020-03	Client sample id	Method Blank		
Dept sample id	7004-003	Material/Matrix		SOLID	
		SAF No	B01-084		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.050	0.16	0.33	1.0	U	SR
Americium 241	14596-10-2	0.028	0.11	0.21	1.0	U	AM
Plutonium 238	13981-16-3	0	0.050	0.19	1.0	U	PU
Plutonium 239/240	PU-239/240	0.025	0.050	0.19	1.0	U	PU
Antimony 125	14234-35-6	U		0.050		U	GAM
Potassium 40	13966-00-2	U		0.36		U	GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	U		0.023	0.10	U	GAM
Radium 226	13982-63-3	U		0.039	0.10	U	GAM
Radium 228	15262-20-1	U		0.11	0.20	U	GAM
Europium 152	14683-23-9	U		0.058	0.10	U	GAM
Europium 154	15585-10-1	U		0.057	0.10	U	GAM
Europium 155	14391-16-3	U		0.055	0.10	U	GAM
Thorium 228	14274-82-9	U		0.029		U	GAM
Thorium 232	TH-232	U		0.11		U	GAM
Uranium 235	15117-96-1	U		0.078		U	GAM
Uranium 238	U-238	U		2.1		U	GAM
Americium 241	14596-10-2	U		0.077		U	GAM

Z-9 Trench Well Deepening & Chara.

QC-BLANK 38860

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	07/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1373

R106020-02 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7004
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1373
Case no No. 630

Lab sample id R106020-02
Dept sample id 7004-002

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-084

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Strontium	21.7	0.81	0.23	1.0		SR	22.0	0.88	99	83-117	80-120
Americium 241	30.7	3.1	0.35	1.0		AM	29.8	1.2	103	82-118	80-120
Plutonium 238	25.9	2.7	0.31	1.0		PU	24.8	0.99	104	81-119	80-120
Plutonium 239/240	29.3	2.9	0.31	1.0		PU	26.4	1.1	111	81-119	80-120
Cobalt 60	0.345	0.053	0.036	0.050		GAM	0.352	0.014	98	68-132	80-120
Cesium 137	0.378	0.045	0.036	0.10		GAM	0.356	0.014	106	69-131	80-120

Z-9 Trench Well Deepening & Chara.

QC-LCS 38859

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 07/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1373

R106020-04 B120X8

DUPLICATE

SDG	7004			Client/Case no	Hanford SDG H1373
Contact	Melissa C. Mannion			Case no	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R106020-04	Lab sample id	R106020-01	Client sample id	B120X8
Dept sample id	7004-004	Dept sample id	7004-001	Location/Matrix	200-Z-9 SOLID
		Received	06/04/01	Collected/Weight	05/31/01 11:33 1110 g
% solids	96.9	% solids	96.9	Custody/SAF No	B01-084-04 B01-084

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Total Strontium	-0.057	0.12	0.21	1.0	U	SR	-0.002	0.13	0.27	U	-	
Americium 241	-0.026	0.051	0.20	1.0	U	AM	0.073	0.097	0.19	U	-	
Plutonium 238	0	0.081	0.22	1.0	U	PU	0	0.095	0.23	U	-	
Plutonium 239/240	-0.020	0.040	0.15	1.0	U	PU	-0.024	0.047	0.18	U	-	
Antimony 125	U		0.046		U	GAM	U		0.10	U	-	
Potassium 40	13.3	0.54	0.20			GAM	11.6	1.1	0.86		14	35
Cobalt 60	U		0.023	0.050	U	GAM	U		0.055	U	-	
Cesium 137	U		0.022	0.10	U	GAM	U		0.041	U	-	
Radium 226	0.359	0.048	0.048	0.10		GAM	0.406	0.099	0.11		12	54
Radium 228	0.818	0.13	0.11	0.20		GAM	0.826	0.23	0.23		1	58
Europium 152	U		0.051	0.10	U	GAM	U		0.12	U	-	
Europium 154	U		0.079	0.10	U	GAM	U		0.19	U	-	
Europium 155	U		0.070	0.10	U	GAM	U		0.12	U	-	
Thorium 228	0.682	0.032	0.030			GAM	0.708	0.058	0.057		4	35
Thorium 232	0.818	0.13	0.11			GAM	0.826	0.23	0.23		1	58
Uranium 235	U		0.095		U	GAM	U		0.17	U	-	
Uranium 238	U		2.6		U	GAM	U		6.4	U	-	
Americium 241	U		0.10		U	GAM	U		0.17	U	-	

Z-9 Trench Well Deepening & Chara.

QC-DUP#1 38861

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	07/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1373

R106020-01 **B120X8**

DATA SHEET

SDG	7004	Client/Case no	Hanford	SDG_H1373	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R106020-01	Client sample id	B120X8		
Dept sample id	7004-001	Location/Matrix	200-Z-9	SOLID	
Received	06/04/01	Collected/Weight	05/31/01 11:33	1110 g	
% solids	96.9	Custody/SAF No	B01-084-04	B01-084	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	-0.002	0.13	0.27	1.0	U	SR
Americium 241	14596-10-2	0.073	0.097	0.19	1.0	U	AM
Plutonium 238	13981-16-3	0	0.095	0.23	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.024	0.047	0.18	1.0	U	PU
Antimony 125	14234-35-6	U		0.10		U	GAM
Potassium 40	13966-00-2	11.6	1.1	0.86			GAM
Cobalt 60	10198-40-0	U		0.055	0.050	U	GAM
Cesium 137	10045-97-3	U		0.041	0.10	U	GAM
Radium 226	13982-63-3	0.406	0.099	0.11	0.10		GAM
Radium 228	15262-20-1	0.826	0.23	0.23	0.20		GAM
Europium 152	14683-23-9	U		0.12	0.10	U	GAM
Europium 154	15585-10-1	U		0.19	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Thorium 228	14274-82-9	0.708	0.058	0.057			GAM
Thorium 232	TH-232	0.826	0.23	0.23			GAM
Uranium 235	15117-96-1	U		0.17		U	GAM
Uranium 238	U-238	U		6.4		U	GAM
Americium 241	14596-10-2	U		0.17		U	GAM

Z-9 Trench Well Deepening & Chara.

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	07/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1373

Test AM Matrix SOLID
SDG 7004
Contact Melissa C. Mannion

METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1373

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241	
Preparation batch 6981-202						
B120X8	R106020-01			7004-001	U	
BLK (QC ID=38860)	R106020-03			7004-003	U	
LCS (QC ID=38859)	R106020-02			7004-002	ok	
Duplicate (R106020-01)	R106020-04			7004-004	-	U
Nominal values and limits from method Z-9 Trench Well Deepening & Chara.				RDLs (pCi/g)	1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6981-202 2σ prep error 5.0 % Reference Lab Notebook 6981 pg. 202																
B120X8	R106020-01			0.19	0.500			79		125			21	06/18/01	06/21	SS-027
BLK (QC ID=38860)	R106020-03			0.21	0.500			67		125				06/18/01	06/21	SS-028
LCS (QC ID=38859)	R106020-02			0.35	0.500			60		161				06/18/01	06/19	SS-024
Duplicate (R106020-01) (QC ID=38861)	R106020-04			0.20	0.500			87		107			19	06/18/01	06/19	SS-038
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-940	Plutonium Separation and Purification, rev 3
	CP-960	Americium-Curium Purification, Large Aliquot, rev 4
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.24 ± 0.15
YIELD 73 ± 24

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1373

Test PU Matrix SOLID
SDG 7004
Contact Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1373

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 6981-202								
B120X8	R106020-01			7004-001	U		U	
BLK (QC ID=38860)	R106020-03			7004-003	U		U	
LCS (QC ID=38859)	R106020-02			7004-002	ok		ok	
Duplicate (R106020-01)	R106020-04			7004-004	-	U	-	U
Nominal values and limits from method Z-9 Trench Well Deepening & Chara.				RDLs (pCi/g)	1.0		1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6981-202 2σ prep error 5.0 % Reference Lab Notebook 6981 pg. 202																
B120X8	R106020-01			0.23	0.500			91		105			19	06/18/01	06/19	SS-041
BLK (QC ID=38860)	R106020-03			0.19	0.500			87		107				06/18/01	06/19	SS-035
LCS (QC ID=38859)	R106020-02			0.31	0.500			54		105				06/18/01	06/19	SS-042
Duplicate (R106020-01) (QC ID=38861)	R106020-04			0.22	0.500			89		125			21	06/18/01	06/21	SS-041
Nominal values and limits from method				1.0	0.500			20-105		100	100		180			

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	CP-060	Soil Preparation, rev 3
	CP-940	Plutonium Separation and Purification, rev 3
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.24	±	0.10
	YIELD	80	±	35

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1373

Test SR Matrix SOLID
SDG 7004
Contact Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1373

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 6981-202						
B120X8	R106020-01			7004-001	U	
BLK (QC ID=38860)	R106020-03			7004-003	U	
LCS (QC ID=38859)	R106020-02			7004-002	ok	
Duplicate (R106020-01)	R106020-04			7004-004	-	U
Nominal values and limits from method Z-9 Trench Well Deepening & Chara.				RDLs (pCi/g)	1.0	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6981-202	2σ prep error 10.0 % Reference Lab Notebook 6981 pg. 202															
B120X8	R106020-01			0.27	1.00			99		100			8	06/08/01	06/08	GRB-223
BLK (QC ID=38860)	R106020-03			0.33	1.00			86		100				06/08/01	06/08	GRB-232
LCS (QC ID=38859)	R106020-02			0.23	1.00			92		100				06/08/01	06/08	GRB-230
Duplicate (R106020-01) (QC ID=38861)	R106020-04			0.21	1.00			94		200			8	06/08/01	06/08	GRB-201
Nominal values and limits from method				1.0	1.00			30-105		100			180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	CP-502	Strontium in Solids, rev 4
	CP-519	Strontium Planchet Demounting and Preparation for 90Y Decontamination, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	0.26	±	0.11
	YIELD	93	±	11

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/18/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1373

Test GAM Matrix SOLID
SDG 7004
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1373

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137	
Preparation batch 6981-202								
B120X8	R106020-01			7004-001	U		U	
BLK (QC ID=38860)	R106020-03			7004-003	U		U	
LCS (QC ID=38859)	R106020-02			7004-002	ok		ok	
Duplicate (R106020-01)	R106020-04			7004-004	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	0.050		0.10	
Z-9 Trench Well Deepening & Chara.								

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6981-202	2σ prep error 15.0 % Reference Lab Notebook 6981 pg. 202															
B120X8	R106020-01			0.12	750					105			8	06/08/01	06/08	02,03,00
BLK (QC ID=38860)	R106020-03			0.039	750					103				06/08/01	06/13	01,03,00
LCS (QC ID=38859)	R106020-02			0.036	750					136				06/08/01	06/08	01,03,00
Duplicate (R106020-01) (QC ID=38861)	R106020-04			0.062	750					139			13	06/08/01	06/13	02,04,00
Nominal values and limits from method				0.050	750					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 3
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.064 ± 0.078
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/18/01

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-084-04	Page 1 of 1

Collector: Fahlberg	Company Contact: C W Miller	Telephone No.: 372-9274	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: Z-9 Trench Well Deepening and Characterization - Soil	Sampling Location: 200- Z- 9 H1373 (7004)	SAF No.: B01-084	
Ice Chest No.: ERC 99-025 (1of1)	Field Logbook No.: EL 1517-1	COA: R20ZP2DP61	Method of Shipment: Fed EX
Shipped To: TMA/RECRA	Offsite Property No.: A010277	Bill of Lading/Air Bill No.: 4235 7954 - 4848	

POSSIBLE SAMPLE HAZARDS/REMARKS
<20000 pCi/g according to BHI-01509

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None						
Type of Container	aG	aG	aG	aG	aG						
No. of Container(s)	1	1	1	1	1						
Volume	250mL	250mL	250mL	500mL	1000mL						
SAMPLE ANALYSIS	Oil & Grease - 413.1 RE	See item (1) in Special Instructions. 5.31.01	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.						

Sample No.	Matrix *	Sample Date	Sample Time										
B120X8	SOIL	5/31/01	1133					X					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: R. Fahlberg	Date/Time: 1500 5.31.01	Received By: Stored in Ref 2-C	Date/Time: 1500 5.31.01
Relinquished By: Ref 2C 3728	Date/Time: 0800 6-1-01	Received By: R Thoren	Date/Time: 0800 6-1-01
Relinquished By: R Thoren	Date/Time: 0800 6-1-01	Received By: FED EX	Date/Time: 6-1-01
Relinquished By: FED EXPRESS	Date/Time: 11:Am 6-2-01	Received By: E. Segura	Date/Time: 8:30 Am 6-4-01
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
See SAF Comment Concerning Pu Analysis

~~(1) Semi-VOA - 8270A (TCL); Semi-VOA - 8270A (Add-On) {Tributyl phosphate}~~
~~(2) ICP Metals - 6010A (TAL); ICP Metals - 6010A (Add-on) {Lead}; Mercury - 7470 - (CV)~~
(3) Gamma Spectroscopy {Cesium-137, Cobalt-60}; Gamma Spec - Add-on {Antimony-125}; Isotopic Plutonium; Americium-241; Neptunium-237; Plutonium-241; Strontium-89,90 -- Total Sr

RT 6-1-01

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 5/31/01.
Collector not available to relenquish samples on 6/1/01 for shipment.

RT 6-1-01

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

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

BHI-EE-011 (10/99)

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc. Date/Time received 6-4-01 8:30 AM

CoC No. B01-084-04

Container I.D. No. _____ 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. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 1 SAMPLES
7. Number of containers per sample: 1 EACH (Or see CoC _____)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: _____
13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by E. Deguro Date: 6-4-01 Time: * 8:30 AM

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

Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____