RECRA LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B00-006
RFW# : 9912L980
SDG# : H0690
SAF# : B00-006

W.O. # : 10985-001-001-9999-00
Date Received: 12-10-99

RECEIVED
APR 11 2000
EDMC

INORGANIC CASE 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 blanks were within method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries were within the 75-125% control limits.

8. The replicate analyses were within the 20% RPD control limit.

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

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

1-26-00
Date

njp\i12-980

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.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610)-280-3000 • Fax (610) 280-3041

Recra LabNet Philadelphia

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 Soilids	__ 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	
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)
Oxygne Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		✓ 9045C	
Sulfide, Reactive		__ Section 7.3	
Sulfide		✓ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Prpearation Leach		__ 1312	
Paint Filter		9095A	

Other: Nitrate Nitrite **Method:** EPA 353.2

Other: Ammonia **Method** EPA 350.3

Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate } EPA 300.0

L-WI-034/B-06/99

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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.

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INORGANICS DATA SUMMARY REPORT 01/26/00

CLIENT: TNU-HANFORD E00-006 RECRA LOT #: 9912L980

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	E0X0B7	% Solids	97.8		%	0.01	1.0
		Chloride by IC	2.5		MG/KG	1.3	1.0
		Fluoride by IC	2.6	u	MG/KG	2.6	1.0
		Nitrite by IC	1.3	u	MG/KG	1.3	1.0
		Nitrate by IC	1.3	u	MG/KG	1.3	1.0
		Cyanide, Total	0.51	u	MG/KG	0.51	1.0
		Phosphate by IC	1.4		MG/KG	1.3	1.0
		Chromium VI	0.97		MG/KG	0.41	1.0
		Sulfate by IC	8.2		MG/KG	1.3	1.0
		Nitrate Nitrite	0.22	u	MG/KG	0.22	1.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	8.6		SOIL PH	0.01	1.0
		Sulfide	4.0		MG/KG	2.0	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/26/00

CLIENT: TNU-HANFORD E00-006 RECRA LOT #: 99121980

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LIC111-MB1	Chloride by IC	1.2	u	MG/KG	1.2	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	1.0
		Nitrite by IC	1.2	u	MG/KG	1.2	1.0
		Nitrate by IC	1.2	u	MG/KG	1.2	1.0
		Phosphate by IC	1.2	u	MG/KG	1.2	1.0
		Sulfate by IC	1.2	u	MG/KG	1.2	1.0
BLANK10	99LC137A-MB1	Cyanide, Total	0.50	u	MG/KG	0.50	1.0
BLANK10	99LVI090-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	99LN3A62-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	99LAMA47-MB1	Ammonia, as N	25.0	u	MG/KG	25.0	1.0
BLANK10	99LSDE75-MB1	Sulfide	2.0	u	MG/KG	2.0	1.0

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INORGANICS ACCURACY REPORT 01/26/00

CLIENT: TNU-HANFORD BCO-006 RECRA LOT #: 99121980

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	BCX0B7	Chloride by IC	29.7	2.5	25.6	106.1	1.0
		Fluoride by IC	60.1	0.71	51.1	116.2	1.0
		Nitrite by IC	28	1.3 u	26	109.6	1.0
		Nitrate by IC	28	1.3 u	26	109.5	1.0
		Cyanide, Total	4.8	0.51u	5.1	94.4	1.0
		Phosphate by IC	28.8	1.4	25.6	107.2	1.0
		Soluble Chromium VI	5.1	0.97	4.1	102.1	1.0
		Insoluble Chromium VI	1130	0.97	1180	96.5	100
		Sulfate by IC	37.4	8.2	25.6	114.1	1.0
		Nitrate Nitrite	5.5	0.22u	5.4	101.8	1.0
		Ammonia, as N	106	1.3 u	102	103.7	1.0
		Sulfide	365	4.0	409	88.3	1.0
BLANK10	99LIC111-MB1	Chloride by IC	23.4	1.2 u	25.0	93.6	1.0
		Fluoride by IC	49.3	2.5 u	50.0	98.6	1.0
		Nitrite by IC	25	1.2 u	25	99.9	1.0
		Nitrate by IC	24	1.2 u	25	96.4	1.0
		Phosphate by IC	24.0	1.2 u	25.0	96.0	1.0
		Sulfate by IC	24.0	1.2 u	25.0	96.2	1.0
BLANK10	99LVI090-MB1	Soluble Chromium VI	3.9	0.40u	4.0	97.7	1.0
		Insoluble Chromium VI	1080	0.40u	1160	92.3	100
BLANK10	99LN2A02-MB1	Nitrate Nitrite	4.7	0.20u	5.0	94.6	1.0
BLANK10	99LAMA47-MB1	Ammonia, as N	918	25.0 u	1000	91.8	1.0
		Ammonia, as N MSD	1010	25.0 u	1000	101.2	1.0
BLANK10	99LSDE75-MB1	Sulfide	9.0	2.0 u	10.0	90.0	1.0

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INORGANICS DUPLICATE SPIKE REPORT 01/26/00

CLIENT: TNU-HANFORD B00-006 RECRA LOT #: 9912L980

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	99LAMA47-MB1	Ammonia, as N	91.8	101.2	9.8

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INORGANICS PRECISION REPORT 01/26/00

CLIENT: TNU-HANFORD B00-006 RECRA LOT #: 9912L980

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	BOX0B7	% Solids	97.8	97.2	0.61	1.0
		Chloride by IC	2.5	2.1	16.7	1.0
		Fluoride by IC	2.6 u	2.6 u	NC	1.0
		Nitrite by IC	1.3 u	1.3 u	NC	1.0
		Nitrate by IC	1.3 u	1.3 u	NC	1.0
		Cyanide, Total	0.51u	0.51u	NC	1.0
		Phosphate by IC	1.4	1.4	1.8	1.0
		Chromium VI	0.97	0.93	3.9	1.0
		Sulfate by IC	8.2	7.0	16.5	1.0
		Nitrate Nitrite	0.22u	0.19u	NC	1.0
		Ammonia, as N	1.3 u	1.3 u	NC	1.0
		pH	8.6	8.6	0.5	1.0
		Sulfide	4.0	2.0 u	NC	1.0

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INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/26/00

CLIENT: TNU-HANFORD B00-006 RECRA LOT #: 9912L980

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS10	99LC137A-LC1	Cyanide, Total LCS	1.8	2.0	MG/KG	92.0
LCS20	99LC137A-LC2	Cyanide, Total LCS	9.7	10	MG/KG	97.5

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-006

DATE RECEIVED: 12/10/99 RFW LOT # :9912L980

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X0B7						
% SOLIDS	001	S	99L%S164	12/07/99	12/15/99	12/16/99
% SOLIDS	001 REP	S	99L%S164	12/07/99	12/15/99	12/16/99
CHLORIDE BY IC	001	S	99LIC111	12/07/99	12/29/99	12/29/99
CHLORIDE BY IC	001 REP	S	99LIC111	12/07/99	12/29/99	12/29/99
CHLORIDE BY IC	001 MS	S	99LIC111	12/07/99	12/29/99	12/29/99
FLUORIDE BY IC	001	S	99LIC111	12/07/99	12/29/99	12/29/99
FLUORIDE BY IC	001 REP	S	99LIC111	12/07/99	12/29/99	12/29/99
FLUORIDE BY IC	001 MS	S	99LIC111	12/07/99	12/29/99	12/29/99
NITRITE BY IC	001	S	99LIC111	12/07/99	12/29/99	12/29/99
NITRITE BY IC	001 REP	S	99LIC111	12/07/99	12/29/99	12/29/99
NITRITE BY IC	001 MS	S	99LIC111	12/07/99	12/29/99	12/29/99
NITRATE BY IC	001	S	99LIC111	12/07/99	12/29/99	12/29/99
NITRATE BY IC	001 REP	S	99LIC111	12/07/99	12/29/99	12/29/99
NITRATE BY IC	001 MS	S	99LIC111	12/07/99	12/29/99	12/29/99
TOTAL CYANIDE	001	S	99LC137A	12/07/99	12/20/99	12/20/99
TOTAL CYANIDE	001 REP	S	99LC137A	12/07/99	12/20/99	12/20/99
TOTAL CYANIDE	001 MS	S	99LC137A	12/07/99	12/20/99	12/20/99
PHOSPHATE BY IC	001	S	99LIC111	12/07/99	12/29/99	12/29/99
PHOSPHATE BY IC	001 REP	S	99LIC111	12/07/99	12/29/99	12/29/99
PHOSPHATE BY IC	001 MS	S	99LIC111	12/07/99	12/29/99	12/29/99
CHROMIUM VI	001	S	99LVI090	12/07/99	12/30/99	12/30/99
CHROMIUM VI	001 REP	S	99LVI090	12/07/99	12/30/99	12/30/99
CHROMIUM VI	001 MS	S	99LVI090	12/07/99	12/30/99	12/30/99
CHROMIUM VI	001 MSD	S	99LVI090	12/07/99	12/30/99	12/30/99
SULFATE BY IC	001	S	99LIC111	12/07/99	12/29/99	12/29/99
SULFATE BY IC	001 REP	S	99LIC111	12/07/99	12/29/99	12/29/99
SULFATE BY IC	001 MS	S	99LIC111	12/07/99	12/29/99	12/29/99
NITRATE NITRITE	001	S	99LN3A62	12/07/99	12/17/99	12/17/99
NITRATE NITRITE	001 REP	S	99LN3A62	12/07/99	12/17/99	12/17/99
NITRATE NITRITE	001 MS	S	99LN3A62	12/07/99	12/17/99	12/17/99
AMMONIA	001	S	99LAMA47	12/07/99	12/21/99	12/22/99
AMMONIA	001 REP	S	99LAMA47	12/07/99	12/21/99	12/22/99
AMMONIA	001 MS	S	99LAMA47	12/07/99	12/21/99	12/22/99
PH	001	S	99LPH133	12/07/99	12/16/99	12/16/99
PH	001 REP	S	99LPH133	12/07/99	12/16/99	12/16/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-006

DATE RECEIVED: 12/10/99 RFW LOT # :9912L980

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SULFIDE	001	S	99LSDB75	12/07/99	12/13/99	12/13/99
SULFIDE	001 REP	S	99LSDB75	12/07/99	12/13/99	12/13/99
SULFIDE	001 MS	S	99LSDB75	12/07/99	12/13/99	12/13/99

LAB QC:

CHLORIDE BY IC	MB1	S	99LIC111	N/A	12/29/99	12/29/99
CHLORIDE BY IC	MB1 BS	S	99LIC111	N/A	12/29/99	12/29/99
FLUORIDE BY IC	MB1	S	99LIC111	N/A	12/29/99	12/29/99
FLUORIDE BY IC	MB1 BS	S	99LIC111	N/A	12/29/99	12/29/99
NITRITE BY IC	MB1	S	99LIC111	N/A	12/29/99	12/29/99
NITRITE BY IC	MB1 BS	S	99LIC111	N/A	12/29/99	12/29/99
NITRATE BY IC	MB1	S	99LIC111	N/A	12/29/99	12/29/99
NITRATE BY IC	MB1 BS	S	99LIC111	N/A	12/29/99	12/29/99
TOTAL CYANIDE	LC1 L	S	99LC137A	N/A	12/20/99	12/20/99
TOTAL CYANIDE	LC2 L	S	99LC137A	N/A	12/20/99	12/20/99
TOTAL CYANIDE	MB1	S	99LC137A	N/A	12/20/99	12/20/99
PHOSPHATE BY IC	MB1	S	99LIC111	N/A	12/29/99	12/29/99
PHOSPHATE BY IC	MB1 BS	S	99LIC111	N/A	12/29/99	12/29/99
CHROMIUM VI	MB1	S	99LVI090	N/A	12/30/99	12/30/99
CHROMIUM VI	MB1 BS	S	99LVI090	N/A	12/30/99	12/30/99
CHROMIUM VI	MB1 BSD	S	99LVI090	N/A	12/30/99	12/30/99
SULFATE BY IC	MB1	S	99LIC111	N/A	12/29/99	12/29/99
SULFATE BY IC	MB1 BS	S	99LIC111	N/A	12/29/99	12/29/99
NITRATE NITRITE	MB1	S	99LN3A62	N/A	12/17/99	12/17/99
NITRATE NITRITE	MB1 BS	S	99LN3A62	N/A	12/17/99	12/17/99
AMMONIA	MB1	S	99LAMA47	N/A	12/21/99	12/22/99
AMMONIA	MB1 BS	S	99LAMA47	N/A	12/21/99	12/22/99
AMMONIA	MB1 BSD	S	99LAMA47	N/A	12/21/99	12/22/99
SULFIDE	MB1	S	99LSDB75	N/A	12/13/99	12/13/99
SULFIDE	MB1 BS	S	99LSDB75	N/A	12/13/99	12/13/99

RECRA LabNet Use Only

99121980

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford B00-006
Est. Final Proj. Sampling Date:
Project #: 10485-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: spec Del: std TAT: 30 days
Date Rec'd: 12/10/99 Date Due: 1/9/00
Account #:

Refrigerator #		1	3	1					3	3	1	3					
#/Type Container	Liquid																
	Solid	1g	1g	1					1g	1g	1	1g					
Volume	Liquid																
	Solid	60	120	1					250	250	1	60					
Preservatives																	
ANALYSES REQUESTED		ORGANIC							INORG								
		VOA	BNA	Pest/PCB	Herb				Metal	CN							
		RECRA LabNet Use Only															
		8260	8270	8081					metC	ICNTO		1PH					

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	8260	8270	8081				metC	ICNTO		1PH					
0001	BOX0B7	X	X	S	12/7/99	1415	✓	✓	✓				✓	✓	✓	✓					

Special Instructions:
Daf # B00-006

COMPOSITE WASTE

DATE/REVISIONS:
Ang (1) = 1N3N2, 1CCL, 1CFL, 1CNO2,
2. 1CNO3, 1CPO4, 1SO4, 1SFD,
3. 1NH3N
met (1) = As, Ba, Cd, Cr, Pb, Se, Ag, Be,
5. Cu, Ni, ~~Hg~~, V, Zn
6. 12/10/99

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___
Airbill # *
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape 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. 2-6 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
* 423579532763

Relinquished by	Received by	Date	Time
FedEx	Jonson	12/10/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 1 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days — Air Quality ☐
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West B8817	SAF No.: B00-006	
Ice Chest No.: EL(99-030)	Field Logbook No.: EL 1435 — COA: B7OCS167IC	Method of Shipment: Fed Ex	
Shipped To: ~~TMA/RECRA~~ RECRA to TD 12-7-99	Offsite Property No.: A00065	Bill of Lading/Air Bill No.: 4235 7953 2763	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

960

Preservation	None	None	None	None	None	Cool 4C	None	None	None	Cool 4C
Type of Container	aG	aG	aG	aG	~~G~~ aG	aG	aG	aG	aG	aG
No. of Container(s)	0	0	0	0	1	1	1	1	1	1
Volume	60mL	60mL	60mL	250mL	60g	60mL	60mL	60mL	60mL	120mL
SAMPLE ANALYSIS	Isotopic Uranium	Technetium-99	Tritium - H3	See item (1) in Special Instructions	pH (Soil) - 9045	VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol)	See item (2) in Special Instructions	See item (3) in Special Instructions	Neptunium-237, Nickel-63	Semi-VOA - 8270A (TCL), TPH-Diesel Range - WTPH-D, PCBs - 8082

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0B7	Soil	12-7-99	1415				X	X	X				X

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: Doug Bowers 12-7-99/1600	Received By: Ref / A — Date/Time: 12-7-99/1600		
Relinquished By: Ref #1A — Date/Time: 12/9/99 1160	Received By: [illegible]/R. Nielson — Date/Time: 12/9/99 1160		
Relinquished By: [illegible]/R. Nielson — Date/Time: 12/9/99 1460	Received By: Fed Ex — Date/Time:		
Relinquished By — Date/Time	Received By — Date/Time		
Relinquished By — Date/Time	Received By — Date/Time		
Relinquished By — Date/Time	Received By — Date/Time		

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63,Tech-99,Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-228}

(3) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Radium-228}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Tho

ICP metals & pH in one 60ml aG container

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)

C13

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 2 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality: [ ]	
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West D8817		SAF No.: B00-006
Ice Chest No.: ERC99-030	Field Logbook No.: EL 1435	COA: B20C81671C	Method of Shipment: Fed Ex
Shipped To: ~~TMA/RECRA~~ RECRA 1520 12-7-99	Offsite Property No.: A000065		Bill of Lading/Air Bill No.: 4235795327 63

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C											
Type of Container	aG											
No. of Container(s)	1											
Volume	250mL											
SAMPLE ANALYSIS	See item (1) in Special Instructions.											
Sample No.	Matrix *	Sample Date	Sample Time									
B0X0B7	Soil	12-7-99	1415	X		Box 76						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: Doug Bowers 12-7-99/1600	Received By: Ref 1A	Date/Time: 12-7-99/1600
Relinquished By: Ref #1A	Date/Time: 1600	Received By: Kelly Nielsen/R. Nielsen	Date/Time: 1600
Relinquished By: Kelly Nielsen/R. Nielsen	Date/Time: 1600	Received By: Fed Ex	Date/Time:
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63,Tech-99,Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) NO2/NO3 - 353.1; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

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)

014

RECRA
ENVIRONMENTAL
INC.
Chemical and Environmental Measurement Information

FEB 2000
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B00-006
RFW# : 9912L980
SDG/SAF# : H0690/B00-006

W.O.# : 10985-001-001-9999-00
Date Received: 12-10-99

METALS CASE NARRATIVE

1. This narrative covers the analyses 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 (80-120% for Mercury).

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 laboratory 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.

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.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B0X0B7	Silver	100	101.0
	Chromium	100	87.5
	Nickel	100	76.4
	Zinc	100	31.0

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

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

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

1-24-00
Date

mld/m12-980

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9912L980

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-11/99

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

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 01/24/00

CLIENT: TNU-HANFORD B00-006 RECRA LOT #: 9912L980

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BCX0B7	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	2.8	MG/KG	0.24	1.0
		Barium, Total	70.2	MG/KG	0.02	1.0
		Beryllium, Total	0.20	MG/KG	0.03	1.0
		Cadmium, Total	0.17	MG/KG	0.04	1.0
		Chromium, Total	39.0	MG/KG	0.06	1.0
		Copper, Total	15.4	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Nickel, Total	25.2	MG/KG	0.09	1.0
		Lead, Total	5.2	MG/KG	0.19	1.0
		Selenium, Total	1.1	MG/KG	0.37	1.0
		Vanadium, Total	25.4	MG/KG	0.05	1.0
		Zinc, Total	201	MG/KG	0.05	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/24/00

CLIENT: TNU-HANFORD B00-006 RECRA LOT #: 9912L980

WORK ORDER: 10965-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0876-MB1	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	0.27 u	MG/KG	0.27	1.0
		Barium, Total	0.02 u	MG/KG	0.02	1.0
		Beryllium, Total	0.03 u	MG/KG	0.03	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.07 u	MG/KG	0.07	1.0
		Copper, Total	0.05 u	MG/KG	0.05	1.0
		Nickel, Total	0.10 u	MG/KG	0.10	1.0
		Lead, Total	0.21 u	MG/KG	0.21	1.0
		Selenium, Total	0.41 u	MG/KG	0.41	1.0
		Vanadium, Total	0.06 u	MG/KG	0.06	1.0
		Zinc, Total	0.05 u	MG/KG	0.05	1.0
BLANK1	00C0002-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 01/24/00

CLIENT: TNU-HANFORD B00-006

RECRA LOT #: 99121980

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0X0B7	Silver, Total	6.1	0.07u	4.5	135.6	1.0
		Arsenic, Total	167	2.8	179	91.3	1.0
		Barium, Total	235	70.2	179	91.8	1.0
		Beryllium, Total	4.1	0.20	4.5	86.7	1.0
		Cadmium, Total	4.4	0.17	4.5	94.0	1.0
		Chromium, Total	37.6	39.0	17.9	-7.8	1.0
		Copper, Total	34.1	15.4	22.4	83.5	1.0
		Mercury, Total	0.15	0.02u	0.15	99.3	1.0
		Nickel, Total	55.8	25.2	44.8	68.3	1.0
		Lead, Total	46.6	5.2	44.8	92.4	1.0
		Selenium, Total	158	1.1	179	87.7	1.0
		Vanadium, Total	68.9	25.4	44.8	97.1	1.0
		Zinc, Total	176	201	44.8	-55. *	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 01/24/00

CLIENT: TNU-HANFORD B00-006

RECRA LOT #: 9912L980

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	EOX0B7	Silver, Total	0.07u	0.08u	NC	1.0
		Arsenic, Total	2.8	1.7	48.9	1.0
		Barium, Total	70.2	71.5	1.8	1.0
		Beryllium, Total	0.20	0.20	0.61	1.0
		Cadmium, Total	0.17	0.19	12.4	1.0
		Chromium, Total	39.0	41.2	5.5	1.0
		Copper, Total	15.4	14.1	8.8	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Nickel, Total	25.2	25.7	2.0	1.0
		Lead, Total	5.2	5.8	10.9	1.0
		Selenium, Total	1.1	1.2	8.7	1.0
		Vanadium, Total	25.4	26.5	4.2	1.0
		Zinc, Total	201	177	12.4	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/24/00

CLIENT: TNU-HANFORD B00-006 RECRA LOT #: 9912I980

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0876-LC1	Silver, LCS	49.3	50.0	MG/KG	98.6
		Arsenic, LCS	945	1000	MG/KG	94.5
		Barium, LCS	491	500	MG/KG	98.2
		Beryllium, LCS	23.5	25.0	MG/KG	94.0
		Cadmium, LCS	24.2	25.0	MG/KG	96.8
		Chromium, LCS	49.8	50.0	MG/KG	99.6
		Copper, LCS	123	125	MG/KG	98.3
		Nickel, LCS	193	200	MG/KG	96.3
		Lead, LCS	241	250	MG/KG	96.5
		Selenium, LCS	918	1000	MG/KG	91.8
		Vanadium, LCS	255	250	MG/KG	101.9
		Zinc, LCS	95.5	100	MG/KG	95.5
LCS1	00C0002-LC1	Mercury, LCS	0.93	1.0	MG/KG	92.8

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-006

DATE RECEIVED: 12/10/99 RFW LOT # :9912L980

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X0B7						
SILVER, TOTAL	001	S	99L0876	12/07/99	01/10/00	01/13/00
SILVER, TOTAL	001 REP	S	99L0876	12/07/99	01/10/00	01/13/00
SILVER, TOTAL	001 MS	S	99L0876	12/07/99	01/10/00	01/13/00
ARSENIC, TOTAL	001	S	99L0876	12/07/99	01/10/00	01/13/00
ARSENIC, TOTAL	001 REP	S	99L0876	12/07/99	01/10/00	01/13/00
ARSENIC, TOTAL	001 MS	S	99L0876	12/07/99	01/10/00	01/13/00
BARIUM, TOTAL	001	S	99L0876	12/07/99	01/10/00	01/13/00
BARIUM, TOTAL	001 REP	S	99L0876	12/07/99	01/10/00	01/13/00
BARIUM, TOTAL	001 MS	S	99L0876	12/07/99	01/10/00	01/13/00
BERYLLIUM, TOTAL	001	S	99L0876	12/07/99	01/10/00	01/14/00
BERYLLIUM, TOTAL	001 REP	S	99L0876	12/07/99	01/10/00	01/14/00
BERYLLIUM, TOTAL	001 MS	S	99L0876	12/07/99	01/10/00	01/14/00
CADMIUM, TOTAL	001	S	99L0876	12/07/99	01/10/00	01/13/00
CADMIUM, TOTAL	001 REP	S	99L0876	12/07/99	01/10/00	01/13/00
CADMIUM, TOTAL	001 MS	S	99L0876	12/07/99	01/10/00	01/13/00
CHROMIUM, TOTAL	001	S	99L0876	12/07/99	01/10/00	01/13/00
CHROMIUM, TOTAL	001 REP	S	99L0876	12/07/99	01/10/00	01/13/00
CHROMIUM, TOTAL	001 MS	S	99L0876	12/07/99	01/10/00	01/13/00
COPPER, TOTAL	001	S	99L0876	12/07/99	01/10/00	01/13/00
COPPER, TOTAL	001 REP	S	99L0876	12/07/99	01/10/00	01/13/00
COPPER, TOTAL	001 MS	S	99L0876	12/07/99	01/10/00	01/13/00
MERCURY, TOTAL	001	S	00C0002	12/07/99	01/04/00	01/04/00
MERCURY, TOTAL	001 REP	S	00C0002	12/07/99	01/04/00	01/04/00
MERCURY, TOTAL	001 MS	S	00C0002	12/07/99	01/04/00	01/04/00
NICKEL, TOTAL	001	S	99L0876	12/07/99	01/10/00	01/13/00
NICKEL, TOTAL	001 REP	S	99L0876	12/07/99	01/10/00	01/13/00
NICKEL, TOTAL	001 MS	S	99L0876	12/07/99	01/10/00	01/13/00
LEAD, TOTAL	001	S	99L0876	12/07/99	01/10/00	01/13/00
LEAD, TOTAL	001 REP	S	99L0876	12/07/99	01/10/00	01/13/00
LEAD, TOTAL	001 MS	S	99L0876	12/07/99	01/10/00	01/13/00
SELENIUM, TOTAL	001	S	99L0876	12/07/99	01/10/00	01/13/00
SELENIUM, TOTAL	001 REP	S	99L0876	12/07/99	01/10/00	01/13/00
SELENIUM, TOTAL	001 MS	S	99L0876	12/07/99	01/10/00	01/13/00
VANADIUM, TOTAL	001	S	99L0876	12/07/99	01/10/00	01/13/00
VANADIUM, TOTAL	001 REP	S	99L0876	12/07/99	01/10/00	01/13/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-006

DATE RECEIVED: 12/10/99 RFW LOT # :9912L980

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	001 MS	S	99L0876	12/07/99	01/10/00	01/13/00
ZINC, TOTAL	001	S	99L0876	12/07/99	01/10/00	01/13/00
ZINC, TOTAL	001 REP	S	99L0876	12/07/99	01/10/00	01/13/00
ZINC, TOTAL	001 MS	S	99L0876	12/07/99	01/10/00	01/13/00

LAB QC:

SILVER LABORATORY	LC1 BS	S	99L0876	N/A	01/10/00	01/12/00
SILVER, TOTAL	MB1	S	99L0876	N/A	01/10/00	01/12/00
ARSENIC LABORATORY	LC1 BS	S	99L0876	N/A	01/10/00	01/12/00
ARSENIC, TOTAL	MB1	S	99L0876	N/A	01/10/00	01/12/00
BARIUM LABORATORY	LC1 BS	S	99L0876	N/A	01/10/00	01/12/00
BARIUM, TOTAL	MB1	S	99L0876	N/A	01/10/00	01/12/00
BERYLLIUM LABORATORY	LC1 BS	S	99L0876	N/A	01/10/00	01/14/00
BERYLLIUM, TOTAL	MB1	S	99L0876	N/A	01/10/00	01/14/00
CADMIUM LABORATORY	LC1 BS	S	99L0876	N/A	01/10/00	01/12/00
CADMIUM, TOTAL	MB1	S	99L0876	N/A	01/10/00	01/12/00
CHROMIUM LABORATORY	LC1 BS	S	99L0876	N/A	01/10/00	01/12/00
CHROMIUM, TOTAL	MB1	S	99L0876	N/A	01/10/00	01/12/00
COPPER LABORATORY	LC1 BS	S	99L0876	N/A	01/10/00	01/12/00
COPPER, TOTAL	MB1	S	99L0876	N/A	01/10/00	01/12/00
MERCURY LABORATORY	LC1 BS	S	00C0002	N/A	01/04/00	01/04/00
MERCURY, TOTAL	MB1	S	00C0002	N/A	01/04/00	01/04/00
NICKEL LABORATORY	LC1 BS	S	99L0876	N/A	01/10/00	01/12/00
NICKEL, TOTAL	MB1	S	99L0876	N/A	01/10/00	01/12/00
LEAD LABORATORY	LC1 BS	S	99L0876	N/A	01/10/00	01/12/00
LEAD, TOTAL	MB1	S	99L0876	N/A	01/10/00	01/12/00
SELENIUM LABORATORY	LC1 BS	S	99L0876	N/A	01/10/00	01/12/00
SELENIUM, TOTAL	MB1	S	99L0876	N/A	01/10/00	01/12/00
VANADIUM LABORATORY	LC1 BS	S	99L0876	N/A	01/10/00	01/12/00
VANADIUM, TOTAL	MB1	S	99L0876	N/A	01/10/00	01/12/00
ZINC LABORATORY	LC1 BS	S	99L0876	N/A	01/10/00	01/12/00
ZINC, TOTAL	MB1	S	99L0876	N/A	01/10/00	01/12/00

RECRA LabNet Use Only: 99121980

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) metals perrone wet

Client: TNU-Hanford B00-006

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 30 days

Date Rec'd: 12/10/99 Date Due: 1/9/00

Account #:

Refrigerator #		1	3									3	3		3	3							
#/Type Container	Liquid																						
	Solid	1g	1g									1g	1g		1g								
Volume	Liquid																						
	Solid	60	120									250	250		60								
Preservatives																							
ANALYSES REQUESTED →		ORGANIC										INORG											
		VOA	BNA	Pest/PCB	Herb							Metal	CN										
		RECRA LabNet Use Only																					
		03 24H	03 25C	03 25H	OPCB							SPECO	ICNTO	Cr6O	IPIX	ICR6							
		03 RDRO																					

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	03 24H	03 25C	03 25H	OPCB	SPECO	ICNTO	Cr6O	IPIX	ICR6
001	BOX0B7	X	X	S	12/7/99	1415	✓	✓	✓		✓	✓	✓	✓	✓
	12/21/99 Hg + CrC6 added per pm.														

Special Instructions:

Saf # B00-006

COMPOSITE WASTE

DATE/REVISIONS:

Ang (1) = 1N3N2, 1CCL, 1CFL, 1CNO2,
2. 1CNO3, 1CPO4, 1SO4, 1SFD,
3. 1NH3N
met (1) = As, Ba, Cd, Cr, Pb, Se, Ag, Be,
5. Cu, Ni, ~~X~~ V, Zn, Hg
6. 12/10/99

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # *

2) Ambient or Chilled

3) Received in Good Condition Y or N

4) Labels Indicate Properly Preserved Y or N

5) Received Within Holding Times Y or N

COC Tape 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. 2-6 °C

Relinquished by	Received by	Date	Time
FedEx	Jonson	12/10/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: * 423579532763

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 1 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West B8817	SAF No.: B00-006	Air Quality ☐
Ice Chest No.: ELC99-03D	Field Logbook No.: EL 1435 — COA: B2OCS167IC	Method of Shipment: Fed Ex	
Shipped To: ~~TMA/RECRA~~ RECRA	Offsite Property No.: A00065	Bill of Lading/Air Bill No.: 4235795327 63	

BB 12-7-99

POSSIBLE SAMPLE HAZARDS/REMARKS

960

Special Handling and/or Storage

Preservation	None	None	None	None	None	Cool 4C	None	None	None	Cool 4C
Type of Container	aG	aG	aG	aG	~~G/P~~ aG	aG	aG	aG	aG	aG
No. of Container(s)	0	0	0	0	1	1	1	1	1	1
Volume	60mL	60mL	60mL	250mL	60g	60mL	60mL	60mL	60mL	120mL
SAMPLE ANALYSIS	Isotopic Uranium	Technetium-99	Tritium - H3	See item (1) in Special Instructions.	pH (Soil) - 9045	VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Neptunium-237; Nickel-63	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D, PCBs - 8082

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0B7	Soil	12-7-99	1415				X	X	X				X

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

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	12-7-99/1600	Bof / A	12-7-99/1600
Ref #1 A	12/9/99 1100	Nielsen/R. Nielson	12/9/99 1100
Nielsen/R. Nielson	12/9/99 1400	Fed Ex	

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63, Tech-99, Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196
(2) Gamma Spec - Complete (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-228)
(3) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Radium-228); Strontium-89,90 – Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Tho

ICP metals & pH in one 60ml aG container

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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 2 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West B8817	SAF No.: B00-006	
Ice Chest No.: ERC99-030	Field Logbook No.: EL 1435	COA: B20C31671C	Method of Shipment: Fed Ex
Shipped To: ~~TMA/RECRA~~ RECRA B70 12-7-99	Offsite Property No.: A00065		Bill of Lading/Air Bill No.: 4235795327 63

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C										
Type of Container	aG										
No. of Container(s)	1										
Volume	250mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.										

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0B7	Soil	12-7-99	1415	X		B0X076							

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By: Doug Bowers / Doug Bowers	12-7-99 / 1600	Received By: Ref 1A	12-7-99 / 1600
Relinquished By: Ref 1A	12/9/99 / 1100	Received By: Nielsen / R. Nielsen	12/9/99 / 1100
Relinquished By: Nielsen / R. Nielsen	12/9/99 / 1400	Received By: Fed Ex	
Relinquished By		Received By	
Relinquished By		Received By	
Relinquished By		Received By	

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63,Tech-99,Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

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)

RECRA LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client: TNU HANFORD B00-006
RFW #: 9912L980
SDG/SAF#: H0690/B00-006

W.O. #: #: 10985-001-001-9999-00
Date Received: 12-10-99

GC SCAN

One (1) soil sample was collected on 12-07-99.

The sample and it's associated QC samples were prepared on 12-16-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and 1-Propanol on 12-16-99.

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 required holding time for analysis was met.

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

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

5. Surrogates were not used for this analysis.

6. All blank spike recoveries were within advisory control limits of 50%-150%.

7. All matrix spike recoveries were within advisory control limits of 50%-150%.

Pr J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

12-21-99
Date

r:\share\le\gcscan\12-980.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 7 pages.

GLOSSARY OF OGCSC DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

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

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates spiked compound.

Recra LabNet - Lionville Laboratory

GC SCAN

Report Date: 12/17/99 09:43

RFW Batch Number: **9912L980** Client: **TNU-HANFORD B00-006** Work Order: **10985-001-001-9999-00** Page: 1

003

	Cust ID:	B0X0B7	B0X0B7	B0X0B7	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	99LLC188-MB1	99LLC188-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

n-Propyl Alcohol	5.0	U	50	%	58	%	5.0	U	57	%
Ethanol	5.0	U	5.0	U	4.9	U	5.0	U	5.0	U

LK 12/17/99

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

Recra LabNet - Lionville Laboratory
SCSC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-006

DATE RECEIVED: 12/10/99 RFW LOT # :9912L980

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X0B7	001	S	99LLC188	12/07/99	12/16/99	12/16/99
B0X0B7	001 MS	S	99LLC188	12/07/99	12/16/99	12/16/99
B0X0B7	001 MSD	S	99LLC188	12/07/99	12/16/99	12/16/99

LAB QC:

BLK	MB1	S	99LLC188	N/A	12/16/99	12/16/99
BLK	MB1 BS	S	99LLC188	N/A	12/16/99	12/16/99

12-20-99

RECRA LabNet Use Only

99121980

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU-Hanford B00-006
Est. Final Proj. Sampling Date:
Project #: 10485-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: spec Del: std TAT: 30 days
Date Rec'd: 12/10/99 Date Due: 1/9/00
Account #:

Refrigerator #		1	3	1					3	3	1	3				
#/Type Container	Liquid															
	Solid	1g	1g	1					1g	1g	1	1g				
Volume	Liquid															
	Solid	60	120	1					250	250	1	60				
Preservatives																
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
		↓ RECRA LabNet Use Only ↓														
		OV 24H OGCSC	OV 25H ODRO	OPCB					Met ①	ICNTO	Ang ①	IPH				

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	OV 24H OGCSC	OV 25H ODRO	OPCB	Met ①	ICNTO	Ang ①	IPH
001	B0X0B7	X	X	S	12/7/99	1415	✓	✓	✓	✓	✓	✓	✓

Special Instructions:
Daf # B00-006

COMPOSITE WASTE

DATE/REVISIONS:
Ang ① = IN3N2, ICCL, ICFL, ICNO2,
2. ICNO3, ICPO4, ICSO4, ISFD,
3. INH3N
Met ① = As, Ba, Cd, Cr, Pb, Se, Ag, Be,
5. Cu, Ni, ~~K~~, V, Zn
6. 12/10/99

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # *
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape 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. 2-6 °C

Relinquished by	Received by	Date	Time
FedEx	Jonson	12/10/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
* 423579532763

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 1 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West B8817	SAF No.: B00-006	Air Quality ☐
Ice Chest No.: ELC99-030	Field Logbook No.: EL 1435 — COA: B7 OCS 167 1C	Method of Shipment: Fed Ex	
Shipped To: ~~TMA/RECRA~~ RECRA BJB 12-7-99	Offsite Property No.: A000065	Bill of Lading/Air Bill No.: 4235 7953 2763	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: 960

Preservation	None	None	None	None	None	Cool 4C	None	None	None	Cool 4C
Type of Container	aG	aG	aG	aG	~~GP~~ aG	aG	aG	aG	aG	aG
No. of Container(s)	0	0	0	0	1	1	1	1	1	1
Volume	60mL	60mL	60mL	250mL	60g	60mL	60mL	60mL	60mL	120mL
SAMPLE ANALYSIS	Isotopic Uranium	Technetium-99	Tritium - H3	See item (1) in Special Instructions.	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (I-Propanol)	See item (2) in Special Instructions	See item (3) in Special Instructions.	Neptunium-237, Nickel-63	Semi-VOA - 8270A (TCL), TPH-Diesel Range - WTPH-D; PCBs - 8082

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0B7	Soil	12-7-99	1415				X	X	X				X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By / Date/Time	Received By / Date/Time
Doug Bowers 12-7-99/1600	Ref / A 12-7-99/1600
Ref #1A 12/9/99 1100	Nielson/R. Nielson 12/9/99 1100
Nielson/R. Nielson 12/9/99 1400	Fed Ex

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63,Tech-99,Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-228}

(3) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Radium-228}; Strontium-89,90 – Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Tho

ICP metals & pH in one 60ml ctr container

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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 2 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West D8817		SAF No.: B00-006
Ice Chest No.: ERC99-030	Field Logbook No.: EL 1435	COA: B20C51671C	Method of Shipment: Fed Ex
Shipped To: ~~TMA/RECRA~~ RECRA B70 12-1-99	Offsite Property No.: A00065		Bill of Lading/Air Bill No.: 4235795327 63

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C										
Type of Container	aG										
No. of Container(s)	1										
Volume	250mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.										

Sample No.	Matrix *	Sample Date	Sample Time											
B0X0B7	Soil	12-7-99	1415	X		Dexo	76							

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: Doug Bowers 12-7-99/1600	Received By: Ref 1A	Date/Time: 12-7-99/1600
Relinquished By: Ref #1A	Date/Time: 12/9/99 1100	Received By: Louie Nielsen / R. Nielsen	Date/Time: 12/9/99 1100
Relinquished By: Louie Nielsen / R. Nielsen	Date/Time: 12/9/99 1400	Received By: Fed Ex	Date/Time:
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63,Tech-99,Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) NO2/NO3 - 353.1; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

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)

0017

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B00-006
RFW# : 9912L980
SDG/SAF#: H0690/B00-006

W.O #: 10985-001-001-9999-00
Date Received: 12-10-99

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 12-07-99.

The sample and it's associated QC samples were prepared on 12-21-99 and analyzed according to Recra OPs based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 12- 23-99. The analysis met the intent of method WTPH-D.

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

2. All required holding times for extraction and analysis were met.

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

4. All diesel continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.

5. All surrogate recoveries were within acceptance criteria.

6. The blank spike recovery was within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

By

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

01-04-00
Date

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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 7 pages.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF DIESEL DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

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

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates spiked compound.

Recra LabNet - Lionville Laboratory

DIESEL RANGE ORGANICS BY GC

Report Date: 12/27/99 13:35

RFW Batch Number: **9912L980** Client: **TNU-HANFORD B00-006** Work Order: **10985-001-001-9999-00** Page: 1

003

	Cust ID:	B0X0B7	B0X0B7	B0X0B7	BLK	BLK BS
Sample Information	RFW#:	001	001 MS	001 MSD	99LE1542-MB1	99LE1542-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Surrogate:	p-Terphenyl	75 %	84 %	82 %	81 %	86 %
Diesel Range Organics		4.1 U	78 %	77 %	4.0 U	92 %

LK 12/27/99

12/28/99

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

Recra LabNet - Lionville Laboratory
DRO ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-006

DATE RECEIVED: 12/10/99 RFW LOT # :9912L980

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BCX0B7	001	S	99LE1542	12/07/99	12/21/99	12/23/99
BCX0B7	001 MS	S	99LE1542	12/07/99	12/21/99	12/23/99
BCX0B7	001 MSD	S	99LE1542	12/07/99	12/21/99	12/23/99

LAB QC:

BLK	MB1	S	99LE1542	N/A	12/21/99	12/23/99
BLK	MB1 BS	S	99LE1542	N/A	12/21/99	12/23/99

12/28/99

RECRA LabNet Use Only

99121980

Custody Transfer Record/Lab Work Request

Page 1 of 1

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) metals perone wet

RECRA LabNet

Client TNU-Hanford B00-006

Est. Final Proj. Sampling Date

Project # 10485-001-001-9999-00

Project Contact/Phone #

RECRA Project Manager OJ

QC spec Del std TAT 30 days

Date Rec'd 12/10/99 Date Due 1/9/00

Account #

Refrigerator #		1	3-1							3	3-1		3	3			
#/Type Container	Liquid																
	Solid	1g	1g-1							1g	1g-1		1g-1				
Volume	Liquid																
	Solid	60	120-1							250	250-1		60-1				
Preservatives																	
ANALYSES REQUESTED		ORGANIC								INORG							
		VOA	BNA	Pest/PCB	Herb					Metal	CN						
		RECRA LabNet Use Only															
		8260	8270	8081						Metals	ICNTO	Hg	IPH	ICR6			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	8260	8270	8081					Metals	ICNTO	Hg	IPH	ICR6			
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	001	B0X0B7	X	X	S	12/7/99	1415	✓	✓	✓					✓	✓	✓	✓	✓			
		12/21/99 Hg + Cr6 added per pm.																				

Special Instructions:

Daf # B00-006

COMPOSITE WASTE

DATE/REVISIONS:

Hg (1) = IN3N2, ICCL, ICFL, ICNO2,
2. ICNO3, ICPO4, ICSO4, ISFD,
3. INH3N
met (1) = As, Ba, Cd, Cr, Pb, Se, Ag, Be,
5. Cu, Ni, ~~K~~, V, Zn, Hg
6. 12/10/99

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # *

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Labels Indicate Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

COC Tape 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. 2-6 °C

Relinquished by	Received by	Date	Time
FedEx	Jansen	12/10/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES:

* 423579532765

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 1 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West B8817		SAF No.: B00-006
Ice Chest No.: EL C99-030	Field Logbook No.: EL 1435	COA: B2005167/C	Method of Shipment: Fed Ex
Shipped To: ~~TMA/RECRA~~ RECRA 12-7-99	Offsite Property No.: A000065		Bill of Lading/Air Bill No.: 4235 7953 2763

Price Code: 8N

Data Turnaround: 45 Days

Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

960

Special Handling and/or Storage

Preservation	None	None	None	None	None	Cool 4C	None	None	None	Cool 4C
Type of Container	aG	aG	aG	aG	~~G/P~~ aG	aG	aG	aG	aG	aG
No. of Container(s)	0	0	0	0	1	1	1	1	1	1
Volume	60mL	60mL	60mL	250mL	60g	60mL	60mL	60mL	60mL	120mL
SAMPLE ANALYSIS	Isotopic Uranium	Technetium-99	Tritium - H3	See item (1) in Special Instructions	pH (Soil) - 9045	VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol)	See item (2) in Special Instructions	See item (3) in Special Instructions	Neptunium-237, Nickel-63	Semi-VOA - 8270A (TCL), TPH-Diesel Range - WTPH-D, PCBs - 8082
Sample No. / Matrix * / Sample Date / Sample Time										
B0X0B7 / Soil / 12-7-99 / 1415				X	X	X				X

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 12-7-99/1600	Received By: Bof / A	Date/Time: 12-7-99/1600
Relinquished By: Bof #1A	Date/Time: 12/8/99 1100	Received By: Dwenlicher/R. Nielson	Date/Time: 12/8/99 1100
Relinquished By: Dwenlicher/R Nielson	Date/Time: 12/8/99 1400	Received By: Fed Ex	Date/Time:
Relinquished By	Date/Time:	Received By	Date/Time:
Relinquished By	Date/Time:	Received By	Date/Time:
Relinquished By	Date/Time:	Received By	Date/Time:

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63,Tech-99,Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-228}

(3) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Radium-228}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Tho

ICP metals & pH in one 60ml aG container

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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 2 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West D8817	SAF No.: B00-006	Air Quality ☐
Ice Chest No.: ERC99-030	Field Logbook No.: EL 1435 — COA: B20031671C	Method of Shipment: Fed Ex	
Shipped To: ~~TMA/RECRA~~ RECRA B20 12-7-99	Offsite Property No.: A00065	Bill of Lading/Air Bill No.: 4235719532763	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C										
Type of Container	aG										
No. of Container(s)	1										
Volume	250mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions.										

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0B7	Soil	12-7-99	1415	X		B0X0	76						

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By: Doug Bowers / Doug Bowers	12-7-99/1600	Received By: Ref 1A	12-7-99/1600
Relinquished By: Ref #1A	12/9/99 1100	Received By: Kelly Nielsen / R. Nielsen	12/9/99 1100
Relinquished By: Kelly Nielsen / R. Nielsen	12/9/99 1100	Received By: Fed Ex	
Relinquished By		Received By	
Relinquished By		Received By	
Relinquished By		Received By	

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63,Tech-99,Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

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)

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

FEB 2000
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B00-006
RFW#: 9912L980
SDG/SAF#: H0690/B00-006

W.O.#: 10985-001-001-9999-00
Date Received: 12-10-99

PCB

One (1) soil sample was collected on 12-07-99.

The sample and its associated QC samples were extracted on 12-21-99 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 01-12-00. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

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 has been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis have been met.
3. The method blank was below the reporting limits for all target compounds.
4. The sample and its associated QC samples received a sulfuric acid and sulfur cleanup.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

01-20-00
Date

pcf:r:\group\data\pest\12L-980.pcb

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 8 pages.

Recra LabNet Philadelphia

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

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

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

Recra LabNet Philadelphia

GLOSSARY OF PESTICIDE/PCB DATA

P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Recra LabNet - Lionville Laboratory

PCBs by GC

Report Date: 01/15/00 10:56

RFW Batch Number: **9912L980** Client: **TNU-HANFORD B00-006** Work Order: 10985001001 Page: 1

	Cust ID:	B0X0B7	B0X0B7	B0X0B7	PBLKCW	PBLKCW BS
Sample Information	RFW#:	001	001 MS	001 MSD	99LE1547-MB1	99LE1547-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:	Tetrachloro-m-xylene	85 %	80 %	82 %	82 %	72 %
	Decachlorobiphenyl	94 %	91 %	93 %	97 %	85 %
Aroclor-1016		34 U	34 U	34 U	33 U	33 U
Aroclor-1221		68 U	68 U	68 U	67 U	67 U
Aroclor-1232		34 U	34 U	34 U	33 U	33 U
Aroclor-1242		34 U	34 U	34 U	33 U	33 U
Aroclor-1248		34 U	34 U	34 U	33 U	33 U
Aroclor-1254		34 U	89 %	90 %	33 U	94 %
Aroclor-1260		34 U	34 U	34 U	33 U	33 U

gw 01-17-00

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

Recra LabNet - Lionville Laboratory
PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-006

DATE RECEIVED: 12/10/99 RFW LOT # :9912L980

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0X0B7	001	S	99LE1547	12/07/99	12/21/99	01/12/00
B0X0B7	001 MS	S	99LE1547	12/07/99	12/21/99	01/12/00
B0X0B7	001 MSD	S	99LE1547	12/07/99	12/21/99	01/12/00

LAB QC:

PBLKCW	MB1	S	99LE1547	N/A	12/21/99	01/12/00
PBLKCW	MB1 BS	S	99LE1547	N/A	12/21/99	01/12/00

01-17-00

RECRA LabNet Use Only: 99121980

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) metals perone wet

Client: TNU-Hanford B00-006
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: spec Del: std TAT: 30 day
Date Rec'd: 12/10/99 Date Due: 1/9/00
Account #:

Refrigerator #		1	3-1						3	3-1		3	3				
#/Type Container	Liquid																
	Solid	1g	1g-1						1g	1g-1		1g-1					
Volume	Liquid																
	Solid	60	120-1						250	250-1		60-1					
Preservatives																	
ANALYSES REQUESTED →		ORGANIC							INORG								
		VOA	BNA	Pest/PCB	Herb				Metal	CN							

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

RECRA LabNet Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	8021 24H	CGCSC	8025H	CDRO	OPCB																
001	BOX0B7	X	X	S	12/7/99	1415	✓		✓		✓							✓	✓	✓	✓	✓					
	12/21/99 Hg + Cr6 added per pm.																										

Special Instructions:
Daf # B00-006

COMPOSITE WASTE

DATE/REVISIONS:
Aug (1) = 1N3N2, 1CCL, 1CFL, 1CNO2,
2. 1CNO3, 1CPO4, 1CSO4, 1SFD,
3. 1NH3N
met (1) = As, Ba, Cd, Cr, Pb, Se, Ag, Be,
5. Cu, Ni, ~~X~~, V, Zn, Hg
6. 12/10/99

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered
Airbill # *
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape 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 2-6 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:
* 423579532765

Relinquished by	Received by	Date	Time
FedEx	Jonson	12/10/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 1 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West B8817	SAF No.: B00-006	Air Quality: [ ]
Ice Chest No.: EEC99-030	Field Logbook No.: EL 1435 — COA: B7OC5167IC	Method of Shipment: Fed Ex	
Shipped To: ~~TMA/RECRA~~ RECRA	Offsite Property No.: A00065	Bill of Lading/Air Bill No.: 4235 7953 2763	

BJB 12-7-99

POSSIBLE SAMPLE HAZARDS/REMARKS

960

Special Handling and/or Storage

Preservation	None	None	None	None	None	Cool 4C	None	None	None	Cool 4C
Type of Container	aG	aG	aG	aG	~~GP~~ aG	aG	aG	aG	aG	aG
No. of Container(s)	0	0	0	0	1	1	1	1	1	1
Volume	60mL	60mL	60mL	250mL	60g	60mL	60mL	60mL	60mL	120mL
SAMPLE ANALYSIS	Isotopic Uranium	Technetium-99	Tritium - H3	See item (1) in Special Instructions	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol)	See item (2) in Special Instructions	See item (3) in Special Instructions	Neptunium-237, Nickel-63	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D, PCBs - 8082
Sample No. / Matrix * / Sample Date / Sample Time										
B0X0B7 / Soil / 12-7-99 / 1415					X	X	X			X

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By: Doug Bowers	Doug Bowers	12-7-99/1600	Received By: B of / A	12-7-99/1600
Relinquished By: Ref #1 A		12/9/99 1100	Received By: Pollenietz/R Nielson	12/9/99 1100
Relinquished By: Pollenietz/R Nielson		12/9/99 1400	Received By: Fed Ex	
Relinquished By			Received By	
Relinquished By			Received By	
Relinquished By			Received By	

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63,Tech-99,Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196
(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-228}
(3) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Radium-228}; Strontium-89,90 – Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Tho

ICP metals & pH in one 60ml aG container

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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 2 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West D8817		SAF No.: B00-006
Ice Chest No.: ERC99-030	Field Logbook No.: EL 1435	COA: B20C51671C	Method of Shipment: Fed Ex
Shipped To: ~~TMA/RECRA~~ RECRA 1520 12-7-99	Offsite Property No.: A000065		Bill of Lading/Air Bill No.: 423579532763

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C											
Type of Container	aG											
No. of Container(s)	1											
Volume	250mL											
SAMPLE ANALYSIS	See item (1) in Special Instructions											

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0B7	Soil	12-7-99	1415	X		B0X076							

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: Doug Bowers 12-7-99/1600	Received By: Ref 1A	Date/Time: 12-7-99/1600
Relinquished By: Ref #1A	Date/Time: 12/9/99 1100	Received By: Nelson/R. Nelson	Date/Time: 12/9/99 1100
Relinquished By: Nelson/R. Nelson	Date/Time: 12/9/99 1100	Received By: Fed Ex	Date/Time:
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63,Tech-99,Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

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)

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

FEB 2000
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B00-006
RFW #: 9912L980
SDG/SAF #: H0690/ B00-006

W.O. #: 10985-001-001-9999-00
Date Received: 12-10-99

SEMIVOLATILE

One (1) soil sample was collected on 12-07-99.

The sample and its associated QC samples were extracted on 12-21-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compounds on 01-17,20-2000.

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. All blank spike recoveries were outside EPA QC limits.

6. All matrix spike recoveries were within EPA QC limits.

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

8. A spectral search was conducted for compounds Tributylphosphate and Butylated Hydroxytoluene; none of these compounds were identified in the sample.

by J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

02-21-00
Date

som\group\data\bna\tnu-hanford-12-980.doc

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

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

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.

mmz\10-94\gloss.bna

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.

mmz\10-94\gloss.bna

Recra LabNet - Lionville Laboratory
Semivolatiles by GC/MS, HSL List

RFW Batch Number: 9912L980 Client: TNU-HANFORD B00-006 Work Order: 10985001001 Report Date: 02/08/00 14:[illegible] Page: 1a

	Cust ID:	B0X0B7		B0X0B7		B0X0B7		SBLKJC		SBLKJC BS	
Sample Information	RFW#:	001		001 MS		001 MSD		99LE1548-MB1		99LE1548-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	Nitrobenzene-d5	68	%	68	%	70	%	63	%	68	%
	2-Fluorobiphenyl	69	%	71	%	76	%	64	%	70	%
	Terphenyl-d14	79	%	75	%	83	%	66	%	83	%
	Phenol-d5	65	%	69	%	72	%	73	%	65	%
	2-Fluorophenol	59	%	67	%	68	%	71	%	63	%
	2,4,6-Tribromophenol	44	%	57	%	59	%	65	%	53	%
Phenol		340	U	62	%	66	%	330	U	61	%
bis(2-Chloroethyl)ether		340	U	340	U	340	U	330	U	330	U
2-Chlorophenol		340	U	64	%	67	%	330	U	61	%
1,3-Dichlorobenzene		340	U	340	U	340	U	330	U	330	U
1,4-Dichlorobenzene		340	U	64	%	68	%	330	U	65	%
1,2-Dichlorobenzene		340	U	340	U	340	U	330	U	330	U
2-Methylphenol		340	U	340	U	340	U	330	U	330	U
2,2'-oxybis(1-Chloropropane)		340	U	340	U	340	U	330	U	330	U
4-Methylphenol		340	U	340	U	340	U	330	U	330	U
N-Nitroso-di-n-propylamine		340	U	72	%	74	%	330	U	71	%
Hexachloroethane		340	U	340	U	340	U	330	U	330	U
Nitrobenzene		340	U	340	U	340	U	330	U	330	U
Isophorone		340	U	340	U	340	U	330	U	330	U
2-Nitrophenol		340	U	340	U	340	U	330	U	330	U
2,4-Dimethylphenol		340	U	340	U	340	U	330	U	330	U
bis(2-Chloroethoxy)methane		340	U	340	U	340	U	330	U	330	U
2,4-Dichlorophenol		340	U	340	U	340	U	330	U	330	U
1,2,4-Trichlorobenzene		340	U	66	%	70	%	330	U	68	%
Naphthalene		340	U	340	U	340	U	330	U	330	U
4-Chloroaniline		340	U	340	U	340	U	330	U	330	U
Hexachlorobutadiene		340	U	340	U	340	U	330	U	330	U
4-Chloro-3-methylphenol		340	U	65	%	68	%	330	U	61	%
2-Methylnaphthalene		340	U	340	U	340	U	330	U	330	U
Hexachlorocyclopentadiene		340	U	340	U	340	U	330	U	330	U
2,4,6-Trichlorophenol		340	U	340	U	340	U	330	U	330	U
2,4,5-Trichlorophenol		850	U	850	U	850	U	840	U	840	U

*= Outside of EPA CLP QC limits.

60

Cust ID:	B0X0B7		B0X0B7		B0X0B7		SBLKJC		SBLKJC BS	
RFW#:	001		001 MS		001 MSD		99LE1548-MB1		99LE1548-MB1	
2-Chloronaphthalene	340	U	340	U	340	U	330	U	330	U
2-Nitroaniline	850	U	850	U	850	U	840	U	840	U
Dimethylphthalate	340	U	340	U	340	U	330	U	330	U
Acenaphthylene	340	U	340	U	340	U	330	U	330	U
2,6-Dinitrotoluene	340	U	340	U	340	U	330	U	330	U
3-Nitroaniline	850	U	850	U	850	U	840	U	840	U
Acenaphthene	340	U	68	%	74	%	330	U	69	%
2,4-Dinitrophenol	850	U	850	U	850	U	840	U	840	U
4-Nitrophenol	850	U	62	%	58	%	840	U	60	%
Dibenzofuran	340	U	340	U	340	U	330	U	330	U
2,4-Dinitrotoluene	340	U	67	%	68	%	330	U	64	%
Diethylphthalate	340	U	340	U	340	U	330	U	330	U
4-Chlorophenyl-phenylether	340	U	340	U	340	U	330	U	330	U
Fluorene	340	U	340	U	340	U	330	U	330	U
4-Nitroaniline	850	U	850	U	850	U	840	U	840	U
4,6-Dinitro-2-methylphenol	850	U	850	U	850	U	840	U	840	U
N-Nitrosodiphenylamine (1)	340	U	340	U	340	U	330	U	330	U
4-Bromophenyl-phenylether	340	U	340	U	340	U	330	U	330	U
Hexachlorobenzene	340	U	340	U	340	U	330	U	330	U
Pentachlorophenol	850	U	59	%	64	%	840	U	67	%
Phenanthrene	340	U	340	U	340	U	330	U	330	U
Anthracene	340	U	340	U	340	U	330	U	330	U
Carbazole	340	U	340	U	340	U	330	U	330	U
Di-n-butylphthalate	340	U	340	U	340	U	330	U	330	U
Fluoranthene	340	U	340	U	340	U	330	U	330	U
Pyrene	340	U	72	%	83	%	330	U	81	%
Butylbenzylphthalate	340	U	340	U	340	U	330	U	330	U
3,3'-Dichlorobenzidine	340	U	340	U	340	U	330	U	330	U
Benzo(a)anthracene	340	U	340	U	340	U	330	U	330	U
Chrysene	340	U	340	U	340	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	230	JB	130	JB	220	JB	37	J	330	U
Di-n-octyl phthalate	340	U	340	U	340	U	330	U	330	U
Benzo(b)fluoranthene	340	U	340	U	340	U	330	U	330	U
Benzo(k)fluoranthene	340	U	340	U	340	U	330	U	330	U
Benzo(a)pyrene	340	U	340	U	340	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	340	U	340	U	340	U	330	U	330	U
Dibenz(a,h)anthracene	340	U	340	U	340	U	330	U	330	U
Benzo(g,h,i)perylene	340	U	340	U	340	U	330	U	330	U

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

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0X0B7

Lab Name: Recra LabNet Work Order: 10985001001

Client: TNU-HANFORD B00-006

Matrix: (soil/water) SOIL Lab Sample ID: 9912L980-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A012017

Level: (low/med) LOW Date Received: 12/10/99

% Moisture: 2 decanted: (Y/N) __ Date Extracted: 12/21/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/20/00

Injection Volume: 2.0(uL) Dilution Factor: 1.00

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

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.12	80	JB
2.	ALDOL CONDENSATE	7.70	200	JAB
3.	ALDOL CONDENSATE	8.48	70	JA
4.	UNKNOWN	9.12	70	J
5.	UNKNOWN	11.14	80	J
6.	ORGANIC ACID	20.60	100	J
7.	UNKNOWN	23.60	100	J
8.	UNKNOWN	24.57	80	J
9.	UNKNOWN	24.94	100	J
10.	UNKNOWN	25.07	200	J

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-006

RFW LOT # :9912L980

CLIENT ID	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
B0X0B7	001	S	99LE1548	12/07/99	12/10/99	12/21/99	01/20/00
B0X0B7	001 MS	S	99LE1548	12/07/99	12/10/99	12/21/99	01/20/00
B0X0B7	001 MSD	S	99LE1548	12/07/99	12/10/99	12/21/99	01/20/00
LAB QC:							
SBLKJC	MB1	S	99LE1548	N/A	N/A	12/21/99	01/17/00
SBLKJC	MB1 BS	S	99LE1548	N/A	N/A	12/21/99	01/20/00

RECRA LabNet Use Only

99121980

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) metals perrone wet

Client: TNU-Hanford B00-006
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: spec Del: std TAT: 30 days
Date Rec'd: 12/10/99 Date Due: 1/9/00
Account #:

Refrigerator #		1	3-1						3	3-1		3	3			
#/Type Container	Liquid															
	Solid	1g	1g-1						1g	1g-1		1g-1				
Volume	Liquid															
	Solid	60	120-1						250	250-1		60-1				
Preservatives																
ANALYSES REQUESTED	ORGANIC: VOA	BNA	Pest/PCB	Herb					INORG: Metal	CN						

RECRA LabNet Use Only

MATRIX CODES	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Cr 24H CCSC	Cr 25H CDRO	OPCB					Metal	ICN TO	Ang	IPH	ICR6			
	001	BOX0B7	X	X	S	12/7/99	1415	✓	✓	✓					✓	✓	✓	✓	✓			
		12/21/99 Hg + Cr6 added per pm.																				

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

Special Instructions:
Ref # B00-006

COMPOSITE WASTE

DATE/REVISIONS:
Ang (1) = 1N3N2, 1CCL, 1CFL, 1CNO2,
2. 1CNO3, 1CPO4, 1CSO4, 1SFD,
3. 1NH3N
met (1) = As, Ba, Cd, Cr, Pb, Se, Ag, Be,
5. Cu, Ni, ~~Tl~~, V, Zn, Hg
6. 12/10/99

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered
Airbill # *
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape 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'l Y or N
Cooler Temp. 2-6 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: * 423579532765

Relinquished by	Received by	Date	Time
FedEx	Jonson	12/10/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 1 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West B8817	SAF No.: B00-006	Air Quality ☐
Ice Chest No.: ELC99-030	Field Logbook No.: EL 1435 — COA: B7OCS167/C	Method of Shipment: Fed Ex	
Shipped To: ~~TMA/RECRA~~ RECRA BB 12-7-99	Offsite Property No.: A000065	Bill of Lading/Air Bill No.: 4235 7953 2763	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

960

Preservation	None	None	None	None	None	Cool 4C	None	None	None	Cool 4C
Type of Container	aG	aG	aG	aG	~~GP~~ aG	aG	aG	aG	aG	aG
No. of Container(s)	0	0	0	0	1	1	1	1	1	1
Volume	60mL	60mL	60mL	250mL	60g	60mL	60mL	60mL	60mL	120mL
SAMPLE ANALYSIS	Isotopic Uranium	Technetium-99	Tritium - H3	See item (1) in Special Instructions	pH (Soil) - 9045	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol)	See item (2) in Special Instructions	See item (3) in Special Instructions	Neptunium-237, Nickel-63	Semi-VOA - 8270A (TCL), TPH-Diesel Range - WTPH-D, PCBs - 8082
Sample No. / Matrix * / Sample Date / Sample Time										
B0X0B7 / Soil / 12-7-99 / 1415				X	X	X				X

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By: Day Bowers	Received By: B of / A	12-7-99/1600
Relinquished By: Ref #1 A	Received By: Fulcontiebr/R. Nielson	12/9/99 1100
Relinquished By: Fulcontiebr/R. Nielson	Received By: Fed Ex	12/9/99 1400
Relinquished By:	Received By:	
Relinquished By:	Received By:	
Relinquished By:	Received By:	

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63,Tech-99,Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-228}

(3) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Radium-228}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Tho

ICP metals & pH in one 60ml aG container

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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 2 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West D8817	SAF No.: B00-006	
Ice Chest No.: ERC99-030	Field Logbook No.: EL 1435	COA: B20031671C	Method of Shipment: Fed Ex
Shipped To: ~~TMA/RECRA~~ RECRA B20 12-7-99	Offsite Property No.: A000065	Bill of Lading/Air Bill No.: 4235795327 63	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C											
Type of Container	aG											
No. of Container(s)	1											
Volume	250mL											
SAMPLE ANALYSIS	See item (1) in Special Instructions											
Sample No.	Matrix *	Sample Date	Sample Time									
B0X0B7	Soil	12-7-99	1415	X		Dexo 76						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 12-7-99/1600	Received By: Ref 1A	Date/Time: 12-7-99/1600
Relinquished By: Ref #1A	Date/Time: 12/9/99 1100	Received By: Kelly Nielsen / R. Nielsen	Date/Time: 12/9/99 1100
Relinquished By: Kelly Nielsen / R. Nielsen	Date/Time: 12/9/99 1100	Received By: Fed Ex	Date/Time:
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63, Tech-99, Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350 3; Total Cyanide - 9010

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)

RECRA
ENVIRONMENTAL
INC.

Chemical and Environmental Measurement Information

FEB 2000
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B00-006
RFW #: 9912L980
SDG/SAF #: H0690/B00-006

W.O. #: 10985-001-001-9999-00
Date Received: 12-10-99

GC/MS VOLATILE

One (1) soil sample was collected on 12-07-99.

The sample and its associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for the client specified Volatile target compounds on 12-14-99.

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. A non-target compound was 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 contaminant Methylene Chloride at a level less than 2x the CRQL.

By J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

02-22-00
Date

som\group\data\voa\tnu-hanford-12-980.doc

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

208 Welsh Pool Road • Lionville, PA 19341-1333 • (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.

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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.

mmz\10-94\gloss.voa

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.

mmz\10-94\gloss.voa

Recra LabNet - Lionville Laboratory
Volatiles by GC/MS, HSL List
Report Date: 02/21/00 16:13

RFW Batch Number: 9912L980 Client: TNU-HANFORD B00-006 Work Order: 10985001001 Page: 1a

	Cust ID:	B0X0B7		B0X0B7		B0X0B7		VBLKLN		VBLKLN BS	
Sample Information	RFW#:	001		001 MS		001 MSD		99LVN494-MB1		99LVN494-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.09		1.04		1.04		1.00		1.00	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate Recovery	Toluene-d8	115	%	100	%	104	%	108	%	106	%
	Bromofluorobenzene	94	%	86	%	88	%	89	%	90	%
	1,2-Dichloroethane-d4	114	%	109	%	107	%	105	%	106	%
Chloromethane		11	U	11	U	11	U	10	U	10	U
Bromomethane		11	U	11	U	11	U	10	U	10	U
Vinyl Chloride		11	U	11	U	11	U	10	U	10	U
Chloroethane		11	U	11	U	11	U	10	U	10	U
Methylene Chloride		20	B	16	B	16	B	7		7	B
Acetone		5	J	4	J	4	J	10	U	2	J
Carbon Disulfide		6	U	6	U	6	U	5	U	5	U
1,1-Dichloroethene		6	U	85	%	89	%	5	U	87	%
1,1-Dichloroethane		6	U	6	U	6	U	5	U	5	U
1,2-Dichloroethene (total)		6	U	6	U	6	U	5	U	5	U
Chloroform		6	U	6	U	6	U	5	U	5	U
1,2-Dichloroethane		6	U	6	U	6	U	5	U	5	U
2-Butanone		11	U	11	U	11	U	10	U	10	U
1,1,1-Trichloroethane		6	U	6	U	6	U	5	U	5	U
Carbon Tetrachloride		6	U	6	U	6	U	5	U	5	U
Bromodichloromethane		6	U	6	U	6	U	5	U	5	U
1,2-Dichloropropane		6	U	6	U	6	U	5	U	5	U
cis-1,3-Dichloropropene		6	U	6	U	6	U	5	U	5	U
Trichloroethene		6	U	98	%	100	%	5	U	98	%
Dibromochloromethane		6	U	6	U	6	U	5	U	5	U
1,1,2-Trichloroethane		6	U	6	U	6	U	5	U	5	U
Benzene		6	U	101	%	102	%	5	U	99	%
Trans-1,3-Dichloropropene		6	U	6	U	6	U	5	U	5	U
Bromoform		6	U	6	U	6	U	5	U	5	U
4-Methyl-2-pentanone		11	U	11	U	11	U	10	U	10	U
2-Hexanone		11	U	11	U	11	U	10	U	10	U
Tetrachloroethene		6	U	6	U	6	U	5	U	5	U
1,1,2,2-Tetrachloroethane		6	U	6	U	6	U	5	U	5	U
Toluene		6	U	105	%	111	%	5	U	106	%

*= Outside of EPA CLP QC limits.

RFW Batch Number: **9912L980** Client: **TNU-HANFORD B00-006** Work Order: 10985001001 Page: 1b

Cust ID:	B0X0B7	B0X0B7	B0X0B7	VBLKLN	VBLKLN BS
RFW#:	001	001 MS	001 MSD	99LVN494-MB1	99LVN494-MB1
Chlorobenzene	6 U	99 %	103 %	5 U	100 %
Ethylbenzene	6 U	6 U	6 U	5 U	5 U
Styrene	6 U	6 U	6 U	5 U	5 U
Xylene (total)	6 U	6 U	6 U	5 U	5 U

*= Outside of EPA CLP QC limits.

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0X0B7

Lab Name: Recra.LabNet Contract: 10985001001

Lab Code: Recra Case No.: ____ SAS No.: ____ SDG No.: ____

Matrix: (soil/water) SOIL Lab Sample ID: 9912L980-001

Sample wt/vol: 4.60 (g/mL) G Lab File ID: n121407

Level: (low/med) LOW Date Received: 12/10/99

% Moisture: not dec. 2 Date Analyzed: 12/14/99

Column: (pack/cap) CAP Dilution Factor: 1.09

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	8.637	9	NJ

Recra LabNet - Lionville Laboratory
VOA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B00-006

RFW LOT # :9912L980

CLIENT ID	RFW #	MTX	PREP #	COLLECTN DATE	REC	EXT/PREP	ANALYSIS
B0X0B7	001	S	99LVN494	12/07/99	12/10/99	N/A	12/14/99
B0X0B7	001 MS	S	99LVN494	12/07/99	12/10/99	N/A	12/14/99
B0X0B7	001 MSD	S	99LVN494	12/07/99	12/10/99	N/A	12/14/99
LAB QC:							
VBLKLN	MB1	S	99LVN494	N/A	N/A	N/A	12/14/99
VBLKLN	MB1 BS	S	99LVN494	N/A	N/A	N/A	12/14/99

gd 03-21-00

RECRA LabNet Use Only

99121980

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

All FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

(8) metals perrone wet

Client: TNU-Hanford B00-006

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 30 day

Date Rec'd: 12/10/99 Date Due: 1/9/00

Account #:

Refrigerator #		1	3→1						3	3→1		3	3				
#/Type Container	Liquid																
	Solid	1g	1g→1						1g	1g→1		1g→1					
Volume	Liquid																
	Solid	60	120→1						250	250→1		60→1					
Preservatives																	
ANALYSES REQUESTED →		ORGANIC							INORG								
		VOA	BNA	Pest/PCB	Herb				Metal	CN							
		RECRA LabNet Use Only															
		8260 CSCSA	8270 CSH ODRO	OPCB					SPEC(1)	ICNTO	BMGO	IPH	ICR6				
001	BOX0B7	✓	✓	✓					✓	✓	✓	✓	✓				

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected
001	BOX0B7	X	X	S	12/7/99	1415
	12/21/99 Hg + Cr6 added per pm.					

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

Special Instructions:

Saf # B00-006

COMPOSITE WASTE

DATE/REVISIONS:

Anig (1) = 1N3N2, 1CCL, 1CFL, 1CNO2,
2. 1CNO3, 1CPO4, 1CSO4, 1SFD,
3. 1NH3N
met (1) = As, Ba, Cd, Cr, Pb, Se, Ag, Be,
5. Cu, Ni, ~~X~~, V, Zn, Hg
6. 12/10/99

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # *

2) Ambient or Chilled

3) Received in Good Condition Y or N

4) Labels Indicate Properly Preserved Y or N

5) Received Within Holding Times Y or N

COC Tape 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. 2-6 °C

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: * 423579532763

Relinquished by	Received by	Date	Time
FedEx	Jenson	12/10/99	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 1 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days — Air Quality: [ ]
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West B-5817	SAF No.: B00-006	
Ice Chest No.: EL C99-030	Field Logbook No.: EL 1435 — COA: B7 0051671C	Method of Shipment: Fed Ex	
Shipped To: ~~TMA/RECRA~~ RECRA 10 B 12-7-99	Offsite Property No.: A00065	Bill of Lading/Air Bill No.: 4235 7153 2163	

POSSIBLE SAMPLE HAZARDS/REMARKS

960

Special Handling and/or Storage

Preservation	None	None	None	None	None	Cool 4C	None	None	None	Cool 4C
Type of Container	aG	aG	aG	aG	~~G/P~~ aG	aG	aG	aG	aG	aG
No. of Container(s)	0	0	0	0	1	1	1	1	1	1
Volume	60mL	60mL	60mL	250mL	60g	60mL	60mL	60mL	60mL	120mL
SAMPLE ANALYSIS	Isotopic Uranium	Technetium-99	Tritium - H3	See item (1) in Special Instructions	pH (Soil) - 9045	VOA - 8260A (TCL), VOA - 8260A (Add-On) {1-Propanol}	See item (2) in Special Instructions	See item (3) in Special Instructions	Neptunium-237, Nickel-63	Semi-VOA - 8270A (TCL), TPH-Diesel Range - WTPH-D, PCBs - 8082

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0B7	Soil	12-7-99	1415				X	X	X				X

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By: Day Bowers Date/Time: Day Bowers 12-7-99/1600	Received By: Bof / A Date/Time: 12-7-99/1600
Relinquished By: Ref #1A Date/Time: 12/9/99 1100	Received By: Date/Time: 1100
Relinquished By: Date/Time: 1400	Received By: Fed Ex Date/Time:
Relinquished By: Date/Time:	Received By: Date/Time:
Relinquished By: Date/Time:	Received By: Date/Time:
Relinquished By: Date/Time:	Received By: Date/Time:

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63,Tech-99,Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spec - Complete {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-228}

(3) Gross Alpha; Gross Beta; Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Radium-228}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Tho

ICP metals & pH in one 60ml ater container

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)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 2 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West D8817	SAF No.: B00-006	Air Quality: [ ]
Ice Chest No.: ERC99-030	Field Logbook No.: EL 1435 — COA: B20C31671C	Method of Shipment: Fed Ex	
Shipped To: ~~TMA/RI/CRA~~ RECRA B70 12-7-99	Offsite Property No.: A00065	Bill of Lading/Air Bill No.: 4235795327 63	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C										
Type of Container	aG										
No. of Container(s)	1										
Volume	250mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions										

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0B7	Soil	12-7-99	1415	X		Dexo 76							

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: Doug Bowers 12-7-99/1600	Received By: Ref 1A	Date/Time: 12-7-99/1600
Relinquished By: Ref #1A	Date/Time: 12/9/99 1100	Received By: Kevin Nielsen / R. Nielsen	Date/Time: 12/9/99 1100
Relinquished By: Kevin Nielsen / R. Nielsen	Date/Time: 12/9/99 1400	Received By: Fed Ex	Date/Time:
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63,Tech-99,Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

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)

FEB 2000
RECEIVED
Data
Log In

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0690 was composed of one solid (soil) sample designated under SAF No. B00-006 with a Project Designation of: 200 Area Source Characterization 200-CS-1 Operable Unit.

The sample was received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist. Results were transmitted to BHI via facsimile on February 9, 2000.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

The gross alpha and gross beta samples were batched with SDG H0662 (7306). The associated method blank in SDG H0662 had gross beta contamination above the RDL (15 pCi/g) for the analysis. No other problems were encountered during the course of the analyses.

2.2 Tritium Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

The Ni-63 samples were batched with SDG H0662 (7306). The Ni-63 matrix spike is of a sample from SDG H0662. No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

The total strontium samples were batched with SDG H0662 (7306). No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

The technetium-99 samples were batched with SDG H0662 (7306). No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

The isotopic thorium samples were batched with SDG H0662 (7306). No problems were encountered during the course of the analyses.

2.7 Total Uranium Analyses

Due to a LCS failure sample B0X0B7 (7321-01) was reanalyzed with new QC samples. No problems were encountered during the course of the second analyses.

2.8 Isotopic Uranium Analyses

BHI did not request any of the samples be analyzed for Isotopic Uranium after reporting the Total Uranium results on January 22, 2000 via facsimile.

2.9 Neptunium-237 Analyses

The Np-237 samples were batched with SDG H0662 (7306). No problems were encountered during the course of the analyses.

2.10 Isotopic Plutonium Analyses

The isotopic plutonium samples were batched with SDG H0662 (7306). No problems were encountered during the course of the analyses.

2.11 Gamma Spec Analyses

Samples were recounted to meet contract required RDLs. No other problems were encountered during the course of the analyses.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

SAMPLE SUMMARY

SDG 2321
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0690

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0X0B7	200 West	SOLID		N912134-01	B00-006	B00-006-17	12/07/99 14:15
Method Blank		SOLID		N912041-03	B00-006		
Method Blank		SOLID		N912041-12	B00-006		
Method Blank		SOLID		N912041-18	B00-006		
Method Blank		SOLID		N912134-03	B00-006		
Method Blank		SOLID		N912134-10	B00-006		
Lab Control Sample		SOLID		N912041-02	B00-006		
Lab Control Sample		SOLID		N912041-11	B00-006		
Lab Control Sample		SOLID		N912041-17	B00-006		
Lab Control Sample		SOLID		N912134-02	B00-006		
Lab Control Sample		SOLID		N912134-09	B00-006		
Duplicate (N912134-01)	200 West	SOLID		N912134-04	B00-006		12/07/99 14:15
Duplicate (N912134-01)	200 West	SOLID		N912134-11	B00-006		12/07/99 14:15
Spike (N912134-01)	200 West	SOLID		N912134-05	B00-006		12/07/99 14:15

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

SDG 7321
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract TEP-SPB-207925
Case no SDG H0690

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
7306		Method Blank	SOLID						N912041-03	7306-003
		Method Blank	SOLID						N912041-12	7306-012
		Method Blank	SOLID						N912041-18	7306-018
		Lab Control Sample	SOLID						N912041-02	7306-002
		Lab Control Sample	SOLID						N912041-11	7306-011
		Lab Control Sample	SOLID						N912041-17	7306-017
7321	B00-006-17	BCX0B7	SOLID	97.6			12/10/99	3	N912134-01	7321-001
		Method Blank	SOLID						N912134-03	7321-003
		Method Blank	SOLID						N912134-10	7321-010
		Lab Control Sample	SOLID						N912134-02	7321-002
		Lab Control Sample	SOLID						N912134-09	7321-009
		Duplicate (N912134-01)	SOLID				12/10/99	3	N912134-04	7321-004
		Duplicate (N912134-01)	SOLID				12/10/99	3	N912134-11	7321-011
		Spike (N912134-01)	SOLID				12/10/99	3	N912134-05	7321-005

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

SDG 7321
Contact Melissa C. Maunion

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SPB-207925
Case no SDG H0690

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
NP	SOLID	Neptunium in Soil	6909-138	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6909-138	5.0	1			1	1	1/1		
TH	SOLID	Thorium, Isotopic in Soil	6909-138	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6909-138	10.0	1			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	6909-138	10.0	1			1	1	1/1		
Gas Proportional Counting												
80A	SOLID	Gross Alpha in Soil	6909-138	20.0	1			1	1	1/1		
80B	SOLID	Gross Beta in Soil	6909-138	15.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6909-186	15.0	1			1	1	1/1		
Kinetic Phosphorimetry												
U_T	SOLID	Uranium, Total in Soil	6909-186	9.0	1			1	1	1/1		
Liquid Scintillation Counting												
H	SOLID	Tritium in Soil	6909-186	10.0	1			1	1	1/1	1/1	
NI_L	SOLID	Nickel 63 in Soil	6909-138	10.0	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 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

WORK SUMMARY

SDG 7321
Contact Melissa C. Mannion

Client Hanford
Contract TEP-SPB-207925
Case no SDG H0690

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
BCX0B7			N912134-01	7321-001	80A/80		01/29/00	02/09/00	MCM	Gross Alpha in Soil
200 West		SOLID	12/07/99	7321-001	80B/80		01/29/00	02/09/00	MCM	Gross Beta in Soil
B00-006-17	B00-006		12/10/99	7321-001	GAM		02/04/00	02/09/00	MCM	Gamma Scan
				7321-001	H		01/27/00	02/09/00	MCM	Tritium in Soil
				7321-001	NI_L		01/31/00	02/09/00	MCM	Nickel 63 in Soil
				7321-001	NP		01/28/00	02/09/00	MCM	Neptunium in Soil
				7321-001	PU		01/26/00	02/09/00	MCM	Plutonium, Isotopic in Solids
				7321-001	SR		01/26/00	02/09/00	MCM	Total Strontium in Soil
				7321-001	TC		02/01/00	02/09/00	MCM	Technetium 99 in Soil
				7321-001	TH		01/28/00	02/09/00	MCM	Thorium, Isotopic in Soil
				7321-001	U_T	A1	01/21/00	01/22/00	MCM	Uranium, Total in Soil
Method Blank			N912041-03	7306-003	80A/80		02/03/00	02/09/00	MCM	Gross Alpha in Soil
		SOLID		7306-003	80B/80		02/03/00	02/09/00	MCM	Gross Beta in Soil
	B00-006			7306-003	PU		01/26/00	02/09/00	MCM	Plutonium, Isotopic in Solids
				7306-003	SR		01/26/00	02/09/00	MCM	Total Strontium in Soil
Method Blank			N912041-12	7306-012	NI_L		01/31/00	02/09/00	MCM	Nickel 63 in Soil
		SOLID		7306-012	TC		01/31/00	02/09/00	MCM	Technetium 99 in Soil
	B00-006			7306-012	TH		01/28/00	02/08/00	MCM	Thorium, Isotopic in Soil
Method Blank			N912041-18	7306-018	NP		02/05/00	02/09/00	MCM	Neptunium in Soil
		SOLID								
	B00-006									
Method Blank			N912134-03	7321-003	GAM		02/04/00	02/09/00	MCM	Gamma Scan
		SOLID		7321-003	H		01/27/00	02/09/00	MCM	Tritium in Soil
	B00-006									
Method Blank			N912134-10	7321-010	U_T		01/21/00	01/22/00	MCM	Uranium, Total in Soil
		SOLID								
	B00-006									
Lab Control Sample			N912041-02	7306-002	80A/80		02/03/00	02/09/00	MCM	Gross Alpha in Soil
		SOLID		7306-002	80B/80		02/03/00	02/09/00	MCM	Gross Beta in Soil
	B00-006			7306-002	PU		01/26/00	02/09/00	MCM	Plutonium, Isotopic in Solids
				7306-002	SR		01/26/00	02/09/00	MCM	Total Strontium in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

SDG 7321
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SPB-207925
Case no SDG H0690

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Lab Control Sample			N912041-11	7306-011	NI_L		01/31/00	02/09/00	MCM	Nickel 63 in Soil
		SOLID		7306-011	TC		01/31/00	02/09/00	MCM	Technetium 99 in Soil
	B00-006			7306-011	TH		01/28/00	02/08/00	MCM	Thorium, Isotopic in Soil
Lab Control Sample			N912041-17	7306-017	NP		02/05/00	02/09/00	MCM	Neptunium in Soil
		SOLID								
	B00-006									
Lab Control Sample			N912134-02	7321-002	GAM		02/04/00	02/09/00	MCM	Gamma Scan
		SOLID		7321-002	H		01/27/00	02/09/00	MCM	Tritium in Soil
	B00-006									
Lab Control Sample			N912134-09	7321-009	U_T		01/21/00	01/22/00	MCM	Uranium, Total in Soil
		SOLID								
	B00-006									
Duplicate (N912134-01)			N912134-04	7321-004	80A/80		01/29/00	02/09/00	MCM	Gross Alpha in Soil
200 West		SOLID	12/07/99	7321-004	80B/80		01/29/00	02/09/00	MCM	Gross Beta in Soil
	B00-006		12/10/99	7321-004	GAM		02/04/00	02/09/00	MCM	Gamma Scan
				7321-004	H		01/27/00	02/09/00	MCM	Tritium in Soil
				7321-004	NI_L		01/31/00	02/09/00	MCM	Nickel 63 in Soil
				7321-004	NP		01/28/00	02/09/00	MCM	Neptunium in Soil
				7321-004	PU		01/26/00	02/09/00	MCM	Plutonium, Isotopic in Solids
				7321-004	SR		01/26/00	02/09/00	MCM	Total Strontium in Soil
				7321-004	TC		02/01/00	02/09/00	MCM	Technetium 99 in Soil
				7321-004	TH		01/31/00	02/09/00	MCM	Thorium, Isotopic in Soil
Duplicate (N912134-01)			N912134-11	7321-011	U_T		01/21/00	01/22/00	MCM	Uranium, Total in Soil
200 West		SOLID	12/07/99							
	B00-006		12/10/99							
Spike (N912134-01)			N912134-05	7321-005	H		01/27/00	02/09/00	MCM	Tritium in Soil
200 West		SOLID	12/07/99							
	B00-006		12/10/99							

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

SDG 7321
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRP-SPB-207925
Case no SDG H0690

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
80A/80	B00-006	Gross Alpha in Soil	EPA900.0	1			1	1	1		4
80B/80	B00-006	Gross Beta in Soil	EPA900.0	1			1	1	1		4
GAM	B00-006	Gamma Scan	GAMMAHI	1			1	1	1		4
H	B00-006	Tritium in Soil	EPA906.0	1			1	1	1	1	5
NI_L	B00-006	Nickel 63 in Soil	NI63LSC	1			1	1	1		4
NP	B00-006	Neptunium in Soil	NP237PLATE	1			1	1	1		4
PU	B00-006	Plutonium, Isotopic in Solids	PUPLATE	1			1	1	1		4
SR	B00-006	Total Strontium in Soil	SRTOTAL	1			1	1	1		4
TC	B00-006	Technetium 99 in Soil	TC99TRLSC	1			1	1	1		4
TH	B00-006	Thorium, Isotopic in Soil	THPLATE	1			1	1	1		4
U_T	B00-006	Uranium, Total in Soil	UKPA	1			1	1	1		4
TOTALS				11			11	11	11	1	45

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
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Report date 02/09/00

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0690

N912041-03 Method Blank

METHOD BLANK

SDG	7321	Client/Case no	Hanford	SDG H0690	
Contact	Melissa C. Mannion	Contract	TRB-SPB-207925		
Lab sample id	N912041-03	Client sample id	Method Blank		
Dept sample id	7306-003	Material/Matrix		SOLID	
		SAF No	B00-006		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.032	1.4	2.9	10	U	80A
Gross Beta	12587-47-2	19.4	5.0	7.0	15		80B
Total Uranium (ug/g)	7440-61-1	N.A.			1.0		U_T
Plutonium 238	13981-16-3	0.003	0.027	0.049	1.0	U	PU
Plutonium 239/240	PU-239/240	0.003	0.014	0.033	1.0	U	PU
Americium 241	14596-10-2	N.A.			1.0		AM
Total Strontium	SR-RAD	0.024	0.23	0.31	1.0	U	SR
Potassium 40	13966-00-2	N.A.					GAM
Cobalt 60	10198-40-0	N.A.			0.050		GAM
Cesium 137	10045-97-3	N.A.			0.10		GAM
Europium 152	14683-23-9	N.A.			0.10		GAM
Europium 154	15585-10-1	N.A.			0.10		GAM
Europium 155	14391-16-3	N.A.			0.10		GAM
Radium 226	13982-63-3	N.A.			0.10		GAM
Radium 228	15262-20-1	N.A.			0.20		GAM
Thorium 228	14274-82-9	N.A.					GAM
Thorium 232	TH-232	N.A.					GAM
Americium 241	14596-10-2	N.A.					GAM
Uranium 238	U-238	N.A.					GAM
Uranium 235	15117-96-1	N.A.					GAM

200 Area Source Chara. - 200-CS-1 OU

QC-BLANK 33045

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

N912041-12 Method Blank

METHOD BLANK

SDG	7321	Client/Case no	Hanford	SDG	H0690
Contact	Melissa C. Mannion	Contract	TEB-SEB-207925		
Lab sample id	N912041-12	Client sample id	Method Blank		
Dept sample id	7306-012	Material/Matrix		SOLID	
		SAF No	B00-006		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Technetium 99	14133-76-7	-0.043	0.28	0.81	15	U	TC
Nickel 63	13981-37-8	0.411	1.2	2.0	30	U	NI_L
Thorium 228	14274-82-9	-0.026	0.078	0.19	1.0	U	TH
Thorium 230	14269-63-7	0.039	0.13	0.17	1.0	U	TH
Thorium 232	TH-232	0.013	0.026	0.099	1.0	U	TH

200 Area Source Chara. - 200-CS-1 OU

QC-BLANK 33199

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

N912041-18 Method Blank

METHOD BLANK

SDG	7321	Client/Case no	Hanford	SDG	H0690
Contact	Melissa C. Mannion	Contract	TRB-SRB-207925		
Lab sample id	N912041-18	Client sample id	Method Blank		
Dept sample id	7306-018	Material/Matrix		SOLID	
		SAF No	B00-006		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Neptunium 237	13994-20-2	0	0.006	0.010		U	NP

200 Area Source Chara. - 200-CS-1 OU

QC-BLANK 33311

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/09/00

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0690

N912134-03 Method Blank

METHOD BLANK

SDG	7321	Client/Case no	Hanford SDG H0690
Contact	Melissa C. Maunion	Contract	TRB-SPB-207925
Lab sample id	N912134-03	Client sample id	Method Blank
Dept sample id	7321-003	Material/Matrix	SOLID
		SAF No	B00-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.143	0.18	0.30	400	U	H
Potassium 40	13966-00-2	U		1.8		U	GAM
Cobalt 60	10198-40-0	U		0.12	0.050	U	GAM
Cesium 137	10045-97-3	U		0.11	0.10	U	GAM
Europium 152	14683-23-9	U		0.29	0.10	U	GAM
Europium 154	15585-10-1	U		0.28	0.10	U	GAM
Europium 155	14391-16-3	U		0.24	0.10	U	GAM
Radium 226	13982-63-3	U		0.18	0.10	U	GAM
Radium 228	15262-20-1	U		0.48	0.20	U	GAM
Thorium 228	14274-82-9	U		0.13		U	GAM
Thorium 232	TH-232	U		0.48		U	GAM
Americium 241	14596-10-2	U		0.29		U	GAM
Uranium 238	U-238	U		13		U	GAM
Uranium 235	15117-96-1	U		0.33		U	GAM

200 Area Source Chara. - 200-CS-1 OU

QC-BLANK 33187

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 02/09/00

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0690

N912134-10 Method Blank

METHOD BLANK

SDG	7321	Client/Case no	Hanford SDG H0690
Contact	Melissa C. Mannion	Contract	TRB-SPB-207925
Lab sample id	N912134-10	Client sample id	Method Blank
Dept sample id	7321-010	Material/Matrix	SOLID
		SAF No	B00-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Uranium (ug/g)	7440-61-1	-0.011	0.003	0.005	1.0	U	U_T

200 Area Source Chara. - 200-CS-1 OU

QC-BLANK 33194

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

N912041-02 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7321 Client/Case no Hanford SDG H0690

Contact Melissa C. Maupin Case no TRB-SVB-207925

Lab sample id N912041-02 Client sample id Lab Control Sample

Dept sample id 7306-002 Material/Matrix SOLID

SAF No R00-006

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	154	13	3.1	10		80A	201	8.0	77	74-126	70-130
Gross Beta	240	11	6.2	15	B	80B	225	9.0	107	74-126	70-130
Total Uranium (ug/g)	N.A.			1.0		U_T					80-120
Plutonium 238	8.45	0.54	0.025	1.0		PU	10.0	0.40	84	88-112	80-120
Plutonium 239/240	9.05	0.57	0.032	1.0		PU	10.6	0.42	85	88-112	80-120
Americium 241	N.A.			1.0		AM					80-120
Total Strontium	11.8	0.67	0.25	1.0		SR	11.2	0.45	105	81-119	80-120
Cobalt 60	N.A.			0.050		GAM					80-120
Cesium 137	N.A.			0.10		GAM					80-120

200 Area Source Chara. - 200-CS-1 OU

QC-LCS 33044

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

N912041-11 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7321 Client/Case no Hanford SDG H0690

Contact Melissa C. Maunion Case no CRR SRP-207925

Lab sample id N912041-11 Client sample id Lab Control Sample

Dept sample id 7306-011 Material/Matrix SOLID

SAF No P00-006

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
Technetium 99	52.5	2.3	0.94	15		TC	56.7	2.3	93	84-116	80-120
Nickel 63	153	3.9	2.0	30		NI_L	147	5.9	104	83-117	80-120
Thorium 228	-0.026	0.13	0.25	1.0	U	TH					
Thorium 230	21.3	1.5	0.16	1.0		TH	22.4	0.90	95	86-114	
Thorium 232	0.079	0.079	0.10	1.0	U	TH					

200 Area Source Chara. - 200-CS-1 OU

QC-LCS 33198

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

N912041-17

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7321

Contact Melissa C. Mannion

Client/Case no Hanford SDG H0690

Case no ERB-SRB-207925

Lab sample id N912041-17

Dept sample id 7320-017

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No B00-006

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
Neptunium 237	10.1	0.44	0.031			NP	10.6	0.42	95	89-111	

200 Area Source Chara. - 200-CS-1 OU

QC-LCS 33310

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

N912134-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7321

Contact Melissa C. Mannion

Client/Case no Hanford SDG H0690

Case no TRB-SHP-207925

Lab sample id N912134-02

Dept sample id 7321-002

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No P00-006

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
Tritium	12.0	0.41	0.30	400	J	H	12.5	0.50	96	84-116	80-120
Cobalt 60	5.29	0.31	0.17	0.050		GAM	6.00	0.24	88	78-122	80-120
Cesium 137	5.98	0.27	0.20	0.10		GAM	6.42	0.26	93	77-123	80-120

200 Area Source Chara. - 200-CS-1 OU

QC-LCS 33186

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

N912134-09 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7321 Client/Case no Hanford SDG H0690

Contact Melissa C. Mannion Case no TFB-SPP-207925

Lab sample id N912134-09 Client sample id Lab Control Sample

Dept sample id 7321-009 Material/Matrix SOLID

SAF No R00-006

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 Uranium (ug/g)	32.2	3.9	0.052	1.0		U_T	37.2	1.5	87	80-120	80-120

200 Area Source Chara. - 200-CS-1 OU

QC-LCS 33193

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

N912134-04

FCX0B7

DUPLICATE

SDG 7321

Contact Melissa C. Mannion

Client/Case no Hanford SDG H0690

Case no TKB SBB-207925

DUPLICATE

Lab sample id N912134-04

Dept sample id 7321-004

ORIGINAL

Lab sample id N912134-01

Dept sample id 7321-001

Received 12/10/99

% solids 97.6

Client sample id FCX0B7

Location/Matrix 200 West SOLID

Collected 12/07/99 14:15

Custody/SAF No F00-006-17 F00-006

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
Gross Alpha	4.64	2.5	2.4	10	J	80A	6.58	3.4	3.9	J	35	121
Gross Beta	35.1	5.9	7.3	15	B	80B	33.1	5.0	5.6	B	6	47
Tritium	0.008	0.057	0.096	400	U	H	0.012	0.057	0.096	U	-	
Neptunium 237	0.021	0.021	0.027		U	NP	-0.016	0.026	0.055	U	-	
Technetium 99	-0.147	0.21	0.51	15	U	TC	-0.049	0.39	1.1	U	-	
Plutonium 238	-0.012	0.032	0.064	1.0	U	PU	-0.007	0.028	0.056	U	-	
Plutonium 239/240	0.004	0.024	0.044	1.0	U	PU	0.007	0.014	0.033	U	-	
Nickel 63	-0.368	1.2	2.0	30	U	NI_L	1.41	1.2	2.0	U	-	
Total Strontium	-0.090	0.15	0.21	1.0	U	SR	-0.133	0.34	0.43	U	-	
Thorium 228	0.538	0.14	0.17	1.0	J	TH	0.516	0.21	0.20	J	4	73
Thorium 230	0.342	0.13	0.15	1.0	J	TH	0.243	0.18	0.23	J	34	114
Thorium 232	0.407	0.10	0.049	1.0	J	TH	0.531	0.18	0.12	J	26	67
Potassium 40	12.3	1.4	0.78			GAM	13.9	1.9	1.2		12	42
Cobalt 60	U		0.081	0.050	U	GAM	U		0.13	U	-	
Cesium 137	U		0.076	0.10	U	GAM	U		0.098	U	-	
Europium 152	U		0.20	0.10	U	GAM	U		0.21	U	-	
Europium 154	U		0.27	0.10	U	GAM	U		0.39	U	-	
Europium 155	U		0.18	0.10	U	GAM	U		0.13	U	-	
Radium 226	0.280	0.13	0.15	0.10		GAM	0.344	0.20	0.21		21	119
Radium 228	0.681	0.35	0.32	0.20		GAM	0.523	0.39	0.47		26	134
Thorium 228	0.586	0.12	0.13			GAM	0.725	0.15	0.14		21	54
Thorium 232	0.681	0.35	0.32			GAM	0.523	0.39	0.47		26	134
Americium 241	U		0.23		U	GAM	U		0.074	U	-	
Uranium 238	U		9.7		U	GAM	U		14	U	-	
Uranium 235	U		0.25		U	GAM	U		0.21	U	-	

200 Area Source Chara. - 200-CS-1 OU

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-DUP

Version 3.06

Report date 02/09/00

DUPLICATE, cont.

SDG 7321		Client/Case no Hanford	SDG H0690
Contact Melissa C. Mannion		Case no TRB-CRB-207925	
DUPLICATE	ORIGINAL		
Lab sample id N912134-04	Lab sample id N912134-01	Client sample id B0X0B7	
Dept sample id 7321-004	Dept sample id 7321-001	Location/Matrix 200 West	SOLID
	Received 12/10/99	Collected 12/07/99 14:15	
	% solids 97.6	Custody/SAF No B00-006-17	P00-006

QC-DUP#1 33188

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

N912134-11 B0X0B7

DUPLICATE

SDG 7321		Client/Case no Hanford	SDG H0690
Contact Melissa C. Mannion		Case no TRP-SPB-207925	
DUPLICATE	ORIGINAL		
Lab sample id N912134-11	Lab sample id N912134-01	Client sample id B0X0B7	
Dept sample id 7321-011	Dept sample id 7321-001	Location/Matrix 200 West	SOLID
	Received 12/10/99	Collected 12/07/99 14:15	
	% solids 97.6	Custody/SAF No B00-006-17	B00-006

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 Uranium (ug/g)	0.396	0.048	0.005	1.0	J	U_T	0.377	0.045	0.005	J	5	32

200 Area Source Chara. - 200-CS-1 OU

QC-DUP#1 33195

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

N912134-05

B0X0B7

MATRIX SPIKE

SDG	7321	Client/Case no	Hanford SDG H0690
Contact	Melissa C. Mannion	Case no	TRP-SMB-207925
MATRIX SPIKE		ORIGINAL	
Lab sample id	N912234-05	Lab sample id	N912234-01
Dept sample id	7321-005	Dept sample id	7321-001
		Received	12/10/99
		% solids	97.6
Client sample id	B0X0B7		
Location/Matrix	200 West SOLID		
Collected	12/07/99 14:15		
Custody/SAF No	B00-006-17 B00-006		

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	38.8	0.41	0.11	400	J	H	55.0	2.2	0.012	0.057	71	88-112	60-140

200 Area Source Chara. - 200-CS-1 OU

QC MS#1 33189

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

N912134-01 B0X0B7

DATA SHEET

SDG	7321	Client/Case no	Hanford SDG H0690
Contact	Melissa C. Mannion	Contract	TRB-SEB-207925
Lab sample id	N912134-01	Client sample id	B0X0B7
Dept sample id	7321-001	Location/Matrix	200 West SOLID
Received	12/10/99	Collected	12/07/99 14:15
% solids	97.6	Custody/SAF No	B00-006-17 B00-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	6.58	3.4	3.9	10	J	80A
Gross Beta	12587-47-2	33.1	5.0	5.6	15	B	80B
Tritium	10028-17-8	0.012	0.057	0.096	400	U	H
Neptunium 237	13994-20-2	-0.016	0.026	0.055		U	NP
Technetium 99	14133-76-7	-0.049	0.39	1.1	15	U	TC
Total Uranium (ug/g)	7440-61-1	0.377	0.045	0.005	1.0	J	U_T
Plutonium 238	13981-16-3	-0.007	0.028	0.056	1.0	U	PU
Plutonium 239/240	PU-239/240	0.007	0.014	0.033	1.0	U	PU
Nickel 63	13981-37-8	1.41	1.2	2.0	30	U	NI_L
Total Strontium	SR-RAD	-0.133	0.34	0.43	1.0	U	SR
Thorium 228	14274-82-9	0.516	0.21	0.20	1.0	J	TH
Thorium 230	14269-63-7	0.243	0.18	0.23	1.0	J	TH
Thorium 232	TH-232	0.531	0.18	0.12	1.0	J	TH
Potassium 40	13966-00-2	13.9	1.9	1.2			GAM
Cobalt 60	10198-40-0	U		0.13	0.050	U	GAM
Cesium 137	10045-97-3	U		0.098	0.10	U	GAM
Europium 152	14683-23-9	U		0.21	0.10	U	GAM
Europium 154	15585-10-1	U		0.39	0.10	U	GAM
Europium 155	14391-16-3	U		0.13	0.10	U	GAM
Radium 226	13982-63-3	0.344	0.20	0.21	0.10		GAM
Radium 228	15262-20-1	0.523	0.39	0.47	0.20		GAM
Thorium 228	14274-82-9	0.725	0.15	0.14			GAM
Thorium 232	TH-232	0.523	0.39	0.47			GAM
Americium 241	14596-10-2	U		0.074		U	GAM
Uranium 238	U-238	U		14		U	GAM
Uranium 235	15117-96-1	U		0.21		U	GAM

200 Area Source Chara. - 200-CS-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

Test NP Matrix SOLID
SDG 7321
Contact Melissa C. Mannion

METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SJB-207925
Case no SDG H0690

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Neptunium 237	
Preparation batch 6909-138						
H0X0B7	N912134-01			7321-001	U	
BLK (QC ID=33311)	N912041-18			7306-018	U	
LCS (QC ID=33310)	N912041-17			7306-017	ok	
Duplicate (N912134-01)	N912134-04			7321-004	-	U

Nominal values and limits from method RDLs (pCi/g)
200 Area Source Chara. - 200-CS-1 OU

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 6909-138 2σ prep error 5.0 % Reference Lab Notebook 6909 pg. 138																
H0X0B7	N912134-01			0.055	0.500			72		1017			52	01/25/00	01/28	SS-58
BLK (QC ID=33311)	N912041-18			0.010	0.500			75		1026				01/25/00	02/05	SS-13
LCS (QC ID=33310)	N912041-17			0.031	0.500			60		1025				01/25/00	02/05	SS-12
Duplicate (N912134-01) (QC ID=33188)	N912134-04			0.027	0.500			67		1017			52	01/25/00	01/28	SS-59
Nominal values and limits from method					0.500			20-105		100			180			

PROCEDURES	REFERENCE	NP237PLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-930	Neptunium Purification, rev 0

AVERAGES ± 2 SD MDA 0.031 ± 0.037
FOR 4 SAMPLES YIELD 68 ± 13

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

Test PU Matrix SOLID
SDG 7321
Contact Melissa C. Munnion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SEP-207925
Case no SDG H0690

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 6909-138								
BCX0B7	N912134-01			7321-001	U		U	
BLK (QC ID=33045)	N912041-03			7306-003	U		U	
LCS (QC ID=33044)	N912041-02			7306-002	LOW		LOW	
Duplicate (N912134-01)	N912134-04			7321-004	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
200 Area Source Chara. - 200-CS-1 OU								

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 6909-138 2σ prep error 5.0 % Reference Lab Notebook 6909 pg. 138																
BCX0B7	N912134-01			0.056	0.500			96		726			50	01/24/00	01/26	SS-035
BLK (QC ID=33045)	N912041-03			0.049	0.500			98		726				01/24/00	01/26	SS-027
LCS (QC ID=33044)	N912041-02			0.032	0.500			85		1034				01/24/00	01/26	SS-065
Duplicate (N912134-01) (QC ID=33188)	N912134-04			0.064	0.500			84		726			50	01/24/00	01/26	SS-036
Nominal values and limits from method				1.0	0.500			20-105		50	100		180			

PROCEDURES	REFERENCE	PUPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.050 ± 0.027
YIELD 91 ± 15

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form PVD-CMS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

Test TH	Matrix SOLID
SDG 7321	
Contact Melissa C. Mannion	

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client Hanford	
Contract TRR-SFR 287825	
Case no SDG H0690	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Thorium 228	Thorium 230	Thorium 232
Preparation batch 6909-138							
B0X0B7	N912134-01			7321-001	0.516 J	0.243 J	0.531 J
BLK (QC ID=33199)	N912041-12			7306-012	U	U	U
LCS (QC ID=33198)	N912041-11			7306-011	No data U	ok	No data U
Duplicate (N912134-01)	N912134-04			7321-004	ok J	ok J	ok J
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0
200 Area Source Chara. - 200-CS-1 OU							

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 6909-138 2σ prep error 5.0 % Reference Lab Notebook 6909 pg. 138																
B0X0B7	N912134-01			0.23	0.250			74		434			52	01/24/00	01/28	SS-038
BLK (QC ID=33199)	N912041-12			0.19	0.250			82		434				01/24/00	01/28	SS-034
LCS (QC ID=33198)	N912041-11			0.25	0.250			81		434				01/24/00	01/28	SS-033
Duplicate (N912134-01) (QC ID=33188)	N912134-04			0.17	0.250			87		848			55	01/24/00	01/31	SS-040
Nominal values and limits from method				1.0	0.250			20-105		200			180			

PROCEDURES	REFERENCE	TMPLATE
	EP-000	Data Entry and Document Preparation, rev 0
	EP-001	Q.C. Preparation, rev 0
	EP-003	Tracing, rev 0
	EP-008	Heavy Elements Electroplating, rev 0
	EP-070	Soil Dissolution, rev 0
	RP-901	Thorium Purification - Small Aliquot, rev 0

AVERAGES ± 2 SD	MDA	0.21	± 0.073
FOR 4 SAMPLES	YIELD	81	± 11

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

Test SR Matrix SOLID
SDG 7321
Contact Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford
Contract TRP-SPB-207925
Case no SDG H0690

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 6909-138						
B0X0B7	N912134-01			7321-001	U	
BLK (QC ID=33045)	N912041-03			7306-003	U	
LCS (QC ID=33044)	N912041-02			7306-002	ok	
Duplicate (N912134-01)	N912134-04			7321-004	-	U

Nominal values and limits from method RDLs (pCi/g) 1.0
200 Area Source Chara. - 200-CS-1 OU

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 6909-138 2σ prep error 10.0 % Reference Lab Notebook 6909 pg. 138																
B0X0B7	N912134-01			0.43	1.00			39		400			50	01/25/00	01/26	GRB-225
BLK (QC ID=33045)	N912041-03			0.31	1.00			49		400				01/25/00	01/26	GRB-221
LCS (QC ID=33044)	N912041-02			0.25	1.00			77		384				01/25/00	01/26	GRB-219
Duplicate (N912134-01) (QC ID=33188)	N912134-04			0.21	1.00			74		400			50	01/25/00	01/26	GRB-227
Nominal values and limits from method				1.0	1.00					100			180			

PROCEDURES	REFERENCE	
	SRTOTAL	
	RP-500	Strontium - Initial Separation, rev 0
	RP-519	Strontium-89,90 Demounting and Yttrium Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.30 ± 0.19
YIELD 60 ± 37

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

Test TC Matrix SOLID
SDG 7321
Contact Melissa C. Mannion

METHOD SUMMARY

TECHNETIUM 99 IN SOIL

BETA COUNTING

Client Hanford
Contract TKB-SFB-207925
Case no SDG H0690

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Technetium 99	
Preparation batch 6909-138						
BCX0B7	N912134-01			7321-001	U	
BLK (QC ID=33199)	N912041-12			7306-012	U	
LCS (QC ID=33198)	N912041-11			7306-011	ok	
Duplicate (N912134-01)	N912134-04			7321-004	-	U

Nominal values and limits from method RDLs (pCi/g) 15
200 Area Source Chara. - 200-CS-1 OU

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 6909-138 2σ prep error 10.0 % Reference Lab Notebook 6909 pg. 138																
BCX0B7	N912134-01			1.1	1.00			31		101			56	01/27/00	02/01	GRB-228
BLK (QC ID=33199)	N912041-12			0.81	1.00			42		101				01/27/00	01/31	GRB-222
LCS (QC ID=33198)	N912041-11			0.94	1.00			38		101				01/27/00	01/31	GRB-221
Duplicate (N912134-01) (QC ID=33188)	N912134-04			0.51	1.00			51		200			56	01/27/00	02/01	GRB-204
Nominal values and limits from method				15	1.00			20-105		50			180			

PROCEDURES	REFERENCE	TC99TRLSC
	EP-060	Soil Preparation, rev 0
	EP-020	Sample Leach For Technetium-99, rev 0
	EP-540	Technetium-99 Purification, rev 0

AVERAGES ± 2 SD MDA 0.84 ± 0.50
FOR 4 SAMPLES YIELD 40 ± 17

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

Test 80A Matrix SOLID
SDG 7321
Contract Melissa C. Mannion

METHOD SUMMARY

GROSS ALPHA IN SOIL
GAS PROPORTIONAL COUNTING

Client Hanford
Contract TKB-SPB-207925
Case no SDG H0690

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Alpha	
Preparation batch 6909-138						
B0X0B7	N912134-01	80		7321-001	6.58	J
BLK (QC ID=33045)	N912041-03	80		7306-003	U	
LCS (QC ID=33044)	N912041-02	80		7306-002	ok	
Duplicate (N912134-01)	N912134-04	80		7321-004	ok	J

Nominal values and limits from method RDLs (pCi/g) 10
200 Area Source Chara. - 200-CS-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6909-138 2σ prep error 20.0 % Reference Lab Notebook 6909 pg. 138																
B0X0B7	N912134-01	80		3.9	0.100			31		100			53	01/25/00	01/29	GRB-115
BLK (QC ID=33045)	N912041-03	80		2.9	0.100			34		100				01/25/00	02/03	GRB-112
LCS (QC ID=33044)	N912041-02	80		3.1	0.100			34		100				01/25/00	02/03	GRB-111
Duplicate (N912134-01) (QC ID=33188)	N912134-04	80		2.4	0.100			30		100			53	01/25/00	01/29	GRB-116
Nominal values and limits from method				10	0.100			5-250		100			180			

PROCEDURES	REFERENCE	EPA900.0
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-170	Preparation of Solids for Gross Alpha and Gross Beta Counting, rev 1

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 3.1 ± 1.2
RESIDUE 32 ± 4

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

Test 80B Matrix SOLID
SDG 7321
Contact Melissa C. Mannion

METHOD SUMMARY

GROSS BETA IN SOIL

GAS PROPORTIONAL COUNTING

Client Hanford
Contract CRB-SPB-207925
Case no SDG H0690

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Gross Beta
Preparation batch 6909-138					
B0X0B7	N912134-01	80		7321-001	33.1
BLK (QC ID=33045)	N912041-03	80		7306-003	19.4
LCS (QC ID=33044)	N912041-02	80		7306-002	ok
Duplicate (N912134-01)	N912134-04	80		7321-004	ok
Nominal values and limits from method				RDLs (pCi/g)	15

200 Area Source Chara. - 200-CS-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6909-138 2σ prep error 15.0 % Reference Lab Notebook 6909 pg. 138																
B0X0B7	N912134-01	80		5.6	0.100			31		100			53	01/25/00	01/29	GRB-115
BLK (QC ID=33045)	N912041-03	80		7.0	0.100			34		100				01/25/00	02/03	GRB-112
LCS (QC ID=33044)	N912041-02	80		6.2	0.100			34		100				01/25/00	02/03	GRB-111
Duplicate (N912134-01) (QC ID=33188)	N912134-04	80		7.3	0.100			30		100			53	01/25/00	01/29	GRB-116
Nominal values and limits from method				15	0.100			5-250		100			180			

PROCEDURES	REFERENCE	EPA900.0
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-170	Preparation of Solids for Gross Alpha and Gross Beta Counting, rev 1

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 6.5 ± 1.5
RESIDUE 32 ± 4

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

Test GAM Matrix SOLID	
SDG 7321	
Contact Melissa C. Mannion	

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford	
Contract TEP-SDR-207925	
Case no SDG H0690	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137	
Preparation batch 6909-186								
B0X0B7	N912134-01			7321-001	U		U	
BLK (QC ID=33187)	N912134-03			7321-003	U		U	
LCS (QC ID=33186)	N912134-02			7321-002	ok		ok	
Duplicate (N912134-01)	N912134-04			7321-004	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	0.050		0.10	
200 Area Source Chara. - 200-CS-1 OU								

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 6909-186 *2σ prep error 15.0 %* *Reference Lab Notebook 6909 pg. 186*																
B0X0B7	N912134-01			0.30	49.7					514			59	01/20/00	02/04	PD,01,00
BLK (QC ID=33187)	N912134-03			0.21	40.0					409				01/20/00	02/04	PD,03,00
LCS (QC ID=33186)	N912134-02			0.17	40.0					514				01/20/00	02/04	PD,03,00
Duplicate (N912134-01) (QC ID=33188)	N912134-04			0.17	49.7					626			59	01/20/00	02/04	PD,03,00
Nominal values and limits from method				0.050	40.0					100			180			

PROCEDURES	REFERENCE	GAMMAHI
	EP-060	Soil Preparation, rev 0
	EP-100	*Ge(Li) Preparation for Environmental Samples*, rev 0

AVERAGES ± 2 SD	MDA	0.21	± 0.12
FOR 4 SAMPLES	YIELD		±

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

Test U T	Matrix SOLID
SDG 7321	
Contact Melissa C. Mannion	

METHOD SUMMARY

URANIUM, TOTAL IN SOIL

KINETIC PHOSPHORIMETRY

Client Hanford	
Contract TRB-SPB-207925	
Case no SDG H0690	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Uranium
Preparation batch 6909-186					
BGX0B7	N912134-01		A1	7321-001	0.377 J
BLK (QC ID=33194)	N912134-10			7321-010	U
LCS (QC ID=33193)	N912134-09			7321-009	ok
Duplicate (N912134-01)	N912134-11			7321-011	ok J
Nominal values and limits from method				RDLs (ug/g)	1.0
200 Area Source Chara. - 200-CS-1 OU					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA ug/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6909-186 2σ prep error 9.0 % Reference Lab Notebook 6909 pg. 186																
BGX0B7	N912134-01		A1	0.005	0.0500								45	01/20/00	01/21	KPA-001
BLK (QC ID=33194)	N912134-10			0.005	0.0500									01/20/00	01/21	KPA-001
LCS (QC ID=33193)	N912134-09			0.052	0.0500									01/20/00	01/21	KPA-001
Duplicate (N912134-01) (QC ID=33195)	N912134-11			0.005	0.0500								45	01/20/00	01/21	KPA-001
Nominal values and limits from method				1.0	0.0500								180			

PROCEDURES	REFERENCE	UKPA
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-044	Preparation of Total Uranium by Kinetic Phosphorimetry, rev 1
	EP-928	Total Uranium by Kinetic Phosphorimetry, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES	MDA	0.017 ± 0.047
	YIELD	±

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

Test H Matrix SOLID
SDG 7321
Contact Melissa C. Mannion

METHOD SUMMARY

TRITIUM IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRB-SPB-207925
Case no SDG H0690

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium	
Preparation batch 6909-186						
EGX0B7	N912134-01			7321-001	U	
BLK (QC ID=33187)	N912134-03			7321-003	U	
LCS (QC ID=33186)	N912134-02			7321-002	ok	J
Duplicate (N912134-01)	N912134-04			7321-004	-	U
Spike (N912134-01)	N912134-05			7321-005	LOW	J

Nominal values and limits from method RDLs (pCi/g) 400
200 Area Source Chara. - 200-CS-1 OU

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 6909-186 2σ prep error 10.0 % Reference Lab Notebook 6909 pg. 186																
EGX0B7	N912134-01			0.096	20.0			100		120			51	01/21/00	01/27	LSC-004
BLK (QC ID=33187)	N912134-03			0.30	20.0			33		120				01/21/00	01/27	LSC-004
LCS (QC ID=33186)	N912134-02			0.30	20.0			33		120				01/21/00	01/27	LSC-004
Duplicate (N912134-01) (QC ID=33188)	N912134-04			0.096	20.0			100		120			51	01/21/00	01/27	LSC-004
Spike (N912134-01) (QC ID=33189)	N912134-05			0.11	20.6			89		120			51	01/21/00	01/27	LSC-004
Nominal values and limits from method				400	20.0					25			180			

PROCEDURES	REFERENCE	EPA906.0
	EP-060	Soil Preparation, rev 0
	EP-211	Tritium in Solid Samples by Azeotropic Distillation, rev 0

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.18 ± 0.22
YIELD 71 ± 70

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/09/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0690

Test NI L Matrix SOLID
SDG 7321
Contact Melissa C. Manning

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRP-SPB-207925
Case no SDG H0690

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63	
Preparation batch 6909-138						
B0X0B7	N912134-01			7321-001	U	
BLK (QC ID=33199)	N912041-12			7306-012	U	
LCS (QC ID=33198)	N912041-11			7306-011	ok	
Duplicate (N912134-01)	N912134-04			7321-004	-	U

Nominal values and limits from method RDLs (pCi/g) 30
200 Area Source Chara. - 200-CS-1 OU

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 6909-138 2σ prep error 10.0 % Reference Lab Notebook 6909 pg. 138																
B0X0B7	N912134-01			2.0	0.500			100		100			55	01/26/00	01/31	LSC-005
BLK (QC ID=33199)	N912041-12			2.0	0.500			100		100				01/26/00	01/31	LSC-005
LCS (QC ID=33198)	N912041-11			2.0	0.500			100		100				01/26/00	01/31	LSC-005
Duplicate (N912134-01) (QC ID=33188)	N912134-04			2.0	0.500			100		100			55	01/26/00	01/31	LSC-005
Nominal values and limits from method				30	0.500					10			180			

PROCEDURES	REFERENCE	NI63LSC
	EP-060	Soil Preparation, rev 0
	EP-431	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 2.0 ± 0
YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/09/00

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-006-17	Page 1 of 2

Collector: R Fahlberg / Bowers	Company Contact: C Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source Characterization 200-CS-1 Operable Unit	Sampling Location: 200 West B8817	SAF No.: B00-006	Air Quality ☐
Ice Chest No.: ERC99-011	Field Logbook No.: EL 1435 — COA: B7 OCS 167/C	Method of Shipment: Fed Ex	
Shipped To: ~~TMA/RECRA~~ TMA — BB 12-7-99	Offsite Property No.: A00 0064	Bill of Lading/Air Bill No.: 423579532741	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	None	None	None	Cool 4C	None	None	None	Cool 4C
Type of Container	aG	aG	aG	aG	~~G/P~~ aG	aG	aG	aG	aG	aG
No. of Container(s)	0	0	0	0	1	1	1	1	1	1
Volume	60mL	60mL	60mL	250mL	60g	60mL	60mL	60mL	60mL	120mL
SAMPLE ANALYSIS	Isotopic Uranium	Technetium-99	Tritium - H3	See item (1) in Special Instructions.	pH (Soil) - 9045	VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol)	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Neptunium-237; Nickel-63	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D, PCBs - 8082

Sample No.	Matrix *	Sample Date	Sample Time										
B0X0B7	Soil	12-7-99	1415	X	X	X				X 3	X 6	X 6	

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	Doug Bowers	12-7-99/1600	R.F. / A	12-7-99/1600
Relinquished By	KGF #1A	12/9/99 1205	Received By: Nielson / R. Nielson	12/9/99 1205
Relinquished By	Nielson / R. Nielson	12/9/99 1400	Received By: FedEx	12-9-99
Relinquished By: FedEx		12-10-99 10:00	Received By: TAV M. Goldenberg	12-10-99 10:00
Relinquished By		Date/Time	Received By	Date/Time
Relinquished By		Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

See Chain of Custody Comments on SAF B00-006. Out of Neptunium Bottle Also Analyze for Nickel-63,Tech-99,Tritium and Iso-Uranium. Out of N02/N03 Bottle Also Analyze For ICP Metals.

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

(2) Gamma Spec - Complete (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-228)

(3) Gross Alpha; Gross Beta; Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Radium-228); Strontium-89,90 – Total Sr; Total Uranium (Uranium); Isotopic Plutonium; Isotopic Thorium (Tho

Isotopic Uranium, Tc-99, & Tritium to be taken out of the 3 60ml aG provided.

Matrix *
S=Soil
SE=Sediment
SO=Solid
S=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wt=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)

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc Date/Time received 12-10-99 10:00

CoC No. B00-006-17, 20

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: 2
7. Number of containers per sample: _____ (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 M. Goldenberg Date: 12-10-99 Time: 10:00

LOGIN

TNU W.O. No. _____ Group No. _____ Client W.O. No. _____

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____