RECRA
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Virtual Laboratories Everywhere

0051520

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-002
RFW# : 9904L807
SDG/SAF# : H0393/B99-002

W.O.# : 10985-001-001-9999-00
Date Received: 04-29-99

AUG 1999
RECEIVED
EDMC

METALS CASE NARRATIVE

1. This narrative covers the analyses of 6 soil samples.

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

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

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

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

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

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) 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. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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.

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

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

5-13-99
Date

mld/m04-807

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9904L807

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

Metals Digestion Methods: ✓3005A __3010A __3015 __3020A ✓3050A __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B		__200.7				__99
Antimony	__6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	__6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	__6010B		__200.7				__99
Beryllium	__6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	__6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	__6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	__6010B		__200.7				__99
Copper	__6010B	__7211 [5]	__200.7	__220.2			__99
Iron	__6010B		__200.7				__99
Lead	✓6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	__6010B		__200.7				__99
Manganese	__6010B		__200.7				__99
Mercury	__7470A [3]	✓7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	__6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	__6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	__6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	__6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	__6010B		__200.7				__99
Zinc	__6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

L-WI-033/M-03/98

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 05/13/99

CLIENT: TNU-HANFORD B99-002 RECRA LOT #: 9904L807

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0VDB2	Chromium, Total	0.42 u	MG/KG	0.42	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.3 u	MG/KG	3.3	1.0
-002	B0VDB3	Chromium, Total	5.8	MG/KG	0.31	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.0	MG/KG	2.4	1.0
-003	B0VD36	Chromium, Total	7.0	MG/KG	0.30	1.0
		Mercury, Total	0.04	MG/KG	0.02	1.0
		Lead, Total	5.5	MG/KG	2.3	1.0
-004	B0VD37	Chromium, Total	9.5	MG/KG	0.41	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	7.9	MG/KG	3.2	1.0
-005	B0VD38	Chromium, Total	6.5	MG/KG	0.40	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Lead, Total	5.3	MG/KG	3.1	1.0
-006	B0VD39	Chromium, Total	7.2	MG/KG	0.37	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Lead, Total	5.3	MG/KG	2.9	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/13/99

CLIENT: TNU-HANFORD B99-002 RECRA LOT #: 9904L807

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0265-MB1	Chromium, Total	0.42 u	MG/KG	0.42	1.0
		Lead, Total	3.3 u	MG/KG	3.3	1.0
BLANK1	99C0122-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 05/13/99

CLIENT: TNU-HANFORD B99-002

RECRA LOT #: 9904L807

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0VDB2	Chromium, Total	16.6	0.42u	18.3	90.7	1.0
		Mercury, Total	0.16	0.02u	0.16	102.5	1.0
		Lead, Total	40.2	3.3 u	45.9	87.6	1.0

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INORGANICS PRECISION REPORT 05/13/99

CLIENT: TNU-HANFORD B99-002

RECRA LOT #: 9904L807

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0VDB2	Chromium, Total	0.42u	0.42u	NC	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Lead, Total	3.3 u	3.3 u	NC	1.0

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INORGANICS LABORATORY CONTROL STANDARDS REPORT 05/13/99

CLIENT: TNU-HANFORD B99-002 RECRA LOT #: 9904L807

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0265-LC1	Chromium, LCS	46.2	50.0	MG/KG	92.4
		Lead, LCS	226	250	MG/KG	90.5
LCS1	99C0122-LC1	Mercury, LCS	1.0	1.0	MG/KG	103.3

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-002

DATE RECEIVED: 04/29/99 RFW LOT # :9904L807

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0VDB2						
CHROMIUM, TOTAL	001	S	99L0265	04/27/99	05/05/99	05/07/99
CHROMIUM, TOTAL	001 REP	S	99L0265	04/27/99	05/05/99	05/07/99
CHROMIUM, TOTAL	001 MS	S	99L0265	04/27/99	05/05/99	05/07/99
MERCURY, TOTAL	001	S	99C0122	04/27/99	05/04/99	05/05/99
MERCURY, TOTAL	001 REP	S	99C0122	04/27/99	05/04/99	05/05/99
MERCURY, TOTAL	001 MS	S	99C0122	04/27/99	05/04/99	05/05/99
LEAD, TOTAL	001	S	99L0265	04/27/99	05/05/99	05/07/99
LEAD, TOTAL	001 REP	S	99L0265	04/27/99	05/05/99	05/07/99
LEAD, TOTAL	001 MS	S	99L0265	04/27/99	05/05/99	05/07/99
B0VDB3						
CHROMIUM, TOTAL	002	S	99L0265	04/27/99	05/05/99	05/07/99
MERCURY, TOTAL	002	S	99C0122	04/27/99	05/04/99	05/05/99
LEAD, TOTAL	002	S	99L0265	04/27/99	05/05/99	05/07/99
B0VD36						
CHROMIUM, TOTAL	003	S	99L0265	04/27/99	05/05/99	05/07/99
MERCURY, TOTAL	003	S	99C0122	04/27/99	05/04/99	05/05/99
LEAD, TOTAL	003	S	99L0265	04/27/99	05/05/99	05/07/99
B0VD37						
CHROMIUM, TOTAL	004	S	99L0265	04/27/99	05/05/99	05/07/99
MERCURY, TOTAL	004	S	99C0122	04/27/99	05/04/99	05/05/99
LEAD, TOTAL	004	S	99L0265	04/27/99	05/05/99	05/07/99
B0VD38						
CHROMIUM, TOTAL	005	S	99L0265	04/27/99	05/05/99	05/07/99
MERCURY, TOTAL	005	S	99C0122	04/27/99	05/04/99	05/05/99
LEAD, TOTAL	005	S	99L0265	04/27/99	05/05/99	05/07/99
B0VD39						
CHROMIUM, TOTAL	006	S	99L0265	04/27/99	05/05/99	05/07/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-002

DATE RECEIVED: 04/29/99 RFW LOT # :9904L807

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MERCURY, TOTAL	006	S	99C0122	04/27/99	05/04/99	05/05/99
LEAD, TOTAL	006	S	99L0265	04/27/99	05/05/99	05/07/99

LAB QC:

CHROMIUM LABORATORY	LC1 BS	S	99L0265	N/A	05/05/99	05/07/99
CHROMIUM, TOTAL	MB1	S	99L0265	N/A	05/05/99	05/07/99
MERCURY LABORATORY	LC1 BS	S	99C0122	N/A	05/04/99	05/05/99
MERCURY, TOTAL	MB1	S	99C0122	N/A	05/04/99	05/05/99
LEAD LABORATORY	LC1 BS	S	99L0265	N/A	05/05/99	05/07/99
LEAD, TOTAL	MB1	S	99L0265	N/A	05/05/99	05/07/99

RECRA LabNet Use Only

9904L807

Custody Transfer Record/Lab Work Request

RECRA LabNet

Client: TNU-Hanford B99-002
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: Spec Del: std TAT: 15 day
Date Rec'd: 4/29/99 Date Due: 5/14/99
Account #:

Refrigerator #								3	3							
#/Type Container	Liquid															
	Solid							1g	1g							
Volume	Liquid															
	Solid							125	250							
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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	RECRA LabNet Use Only: ICP6	Cr Pb Hg									
001	BØVDB2			S	4/27/99	0830	✓	✓									
2	B3					1045	✓	✓									
3	36					0930	✓	✓									
4	37					1000	✓	✓									
5	38					1015	✓	✓									
6	39					1015	✓	✓									

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

Saf# B99-002

COMPOSITE WASTE

DATE/REVISIONS:
1. Run matrix QC
2.
3.
4.
5.
6.

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

Discrepancies Between Samples Lables and COC Record? Y or N

NOTES:
*423579525290 - 3.3°C

Relinquished by	Received by	Date	Time
Jeelee	Jodur	4/29/99	0930

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

Page 1 of 1

012

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-002-93

Collector: Fahlberg/Kerkow	Company Contact: R Coffman	Telephone No.: 373-6425	Project Coordinator: TRENT, SJ
Project Designation: 100 BC Areas - Full Protocol	Sampling Location: 100 B/C 116-B-6B		SAF No.: B99-002
Ice Chest No.: L0026 36165	Field Logbook No.: EL 1327-3		Method of Shipment: Fed. Ex
Shipped To: ~~[illegible]~~/RECRA RS. 4-27-99	Offsite Property No.: A990123		Bill of Lading/Air Bill No.: 4285795252 90 ~~R16B6B2600~~ 4/28/99 RJN
			COA: Fed Ex R16B6B2600

Price Code: copy

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

807

Special Handling and/or Storage

Preservation	None	None	Cool 4C	None	None						
Type of Container	P	aG	aG	aG	aG						
No. of Container(s)	1	1	1	1	1						
Volume	20mL	60mL	125mL	250mL	1000mL						
SAMPLE ANALYSIS	Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.						

Sample No.	Matrix *	Sample Date	Sample Time										
B0VDB2	Soil	4.27.99	0830			X	X						
B0VDB3	Soil	4.27.99	1045			X	X				tie to B0V0X4		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	1620 4-27-99	Ref 1-C	1620 4-27-99
Ref 1-C	4/28/99 ~~4/28/99~~ RJN	Renee Nielsen / R Nielson	4/28/99 0930
Renee Nielsen / R Nielson	4/28/99 0930	Fed Ex	
Fedex		Joder	4/29/99 0930

SPECIAL INSTRUCTIONS

(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

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

013

Collector Fahlberg/Kerkow	Company Contact R Coffman	Telephone No. 373-6425	Project Coordinator TRENT, SJ
Project Designation 100 BC Areas - Full Protocol	Sampling Location 100 B/C 116-B-6B		SAF No. B99-002
Ice Chest No. L0026 36 lbs	Field Logbook No. EL 1327-3		Method of Shipment Fed Ex
Shipped To ~~TMA~~/RECRA RF 4.27.99	Offsite Property No. A990123		Bill of Lading/Air Bill No. 423579525290
			COA R16B6B2600

Price Code: Copy

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	Cool 4C	None	None					
Type of Container	P	aG	aG	aG	aG					
No. of Container(s)	1	1	1	1	1					
Volume	20mL	60mL	125mL	250mL	1000mL					
SAMPLE ANALYSIS	Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.					

Sample No.	Matrix *	Sample Date	Sample Time									
B0VD36	Soil	4.27.99	0930			X	X				tieto	B0V013
B0VD37	Soil	4.27.99	1000			X	X					B0V016
B0VD38	Soil	4-27-99	1015			X	X					B0V0W8
B0VD39	Soil	4.27.99	1015			X	X					B0V0W8

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / Rf Fahlberg	1620 4-27-99	Ref 1-C	1620 4-27-99
Ref 1-C	4/28/99 0930	Bernie Nielson / R. Nielson	4/28/99 0930
Bernie Nielson / R. Nielson	4/28/99 0930	Fed Ex	
Fed Ex		[illegible]	4/29/99 0930

SPECIAL INSTRUCTIONS

(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

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

14

RECRA LabNet
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Virtual Laboratories Everywhere

JUN 1999
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-002
RFW# : 9904L807
SDG# : H0393
SAF# : B99-002

W.O. # : 10985-001-001-9999-00
Date Received: 04-29-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 6 solid samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

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

5. The method blank for Nitrate was within method criteria.

6. The Laboratory Control Sample (LCS) for Soluble Chromium VI was within the laboratory control limits (LCL), however the Insoluble was above the LCL of 80-120%.

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

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

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

for Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

5-14-99
Date

njp\i04-807

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 12 pages.

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

WET CHEMISTRY
METHODS GLOSSARY FOR ANALYSIS OF SOIL/SOLID SAMPLES

	ASTM	SW846	OTHER
%Ash	__ D2216-80		
%Moisture	__ D2216-80		__ ILMO4.0 (e)
%Solids			✓ ILMO4.0 (e)
%Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Corrosivity __by coupon __by pH		__ 1110 (mod)__ 9045	
Cyanide, Total		__ 9010	__ ILMO4.0 (e)
Cyanide, Reactive		__ Sec 7.3	
Density			__ b
Halides, Extractable Organic			__ EPA 600/4/84-008 (mod)
Halides, Total			__ EPA 600/4/84-008 (mod)
EP-Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Carbon, Total Organic (by LOI)			__ c
Oil and Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87 (mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1 (mod)
pH, Soil		__ 9045B	
Sulfide, Reactive		__ Sec 7.3	
Specific Gravity	__ D1429-76C		
Sulfur, Total		__ 9056	
TCLP		__ 1311	
TCLV		__ 1311	
Synthetic Precipitation Leach		__ 1312	
Chlorine, Total		__ 9056	
Paint Filter		__ 9095	

Other: Chromium VI Method: SW3060A/7196A

002

RWW 21-21-034/B-08/95

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., (1989).

b. Standard Methods for the Examination of Water and Waste, 17 ed., (1983)

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.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 05/05/99

CLIENT: TNU-HANFORD B99-002 RECRA LOT #: 9904L807

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0VDB2	% Solids	100	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-002	B0VDB3	% Solids	97.7	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-003	B0VD36	% Solids	96.1	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-004	B0VD37	% Solids	95.5	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-005	B0VD38	% Solids	94.6	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-006	B0VD39	% Solids	95.6	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/05/99

CLIENT: TNU-HANFORD B99-002 RECRA LOT #: 9904L807

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVI037-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 05/05/99

CLIENT: TNU-HANFORD B99-002 RECRA LOT #: 9904L807

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0VDB2	Soluble Chromium VI	3.7	0.40u	4.0	96.6	1.0
		Insoluble Chromium VI	1360	0.40u	1190	114.3	100
BLANK10	99LVI037-MB1	Soluble Chromium VI	3.8	0.40u	4.0	96.0	1.0
		Insoluble Chromium VI	1550	0.40u	1210	128.0	100

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 05/05/99

CLIENT: TNU-HANFORD B99-002 RECRA LOT #: 9904L807

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0VDB2	Chromium VI	0.40u	0.40u	NC	1.0
-006REP	B0VD39	% Solids	95.6	95.6	0.010	1.0

~~008~~ 007 5/24/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-002

DATE RECEIVED: 04/29/99 RFW LOT # :9904L807

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0VDB2						
% SOLIDS	001	S	99L%S060	04/27/99	04/30/99	05/03/99
CHROMIUM VI	001	S	99LVI037	04/27/99	05/03/99	05/03/99
CHROMIUM VI	001 REP	S	99LVI037	04/27/99	05/03/99	05/03/99
CHROMIUM VI	001 MS	S	99LVI037	04/27/99	05/03/99	05/03/99
CHROMIUM VI	001 MSD	S	99LVI037	04/27/99	05/03/99	05/03/99
B0VDB3						
% SOLIDS	002	S	99L%S060	04/27/99	04/30/99	05/03/99
CHROMIUM VI	002	S	99LVI037	04/27/99	05/03/99	05/03/99
B0VD36						
% SOLIDS	003	S	99L%S060	04/27/99	04/30/99	05/03/99
CHROMIUM VI	003	S	99LVI037	04/27/99	05/03/99	05/03/99
B0VD37						
% SOLIDS	004	S	99L%S060	04/27/99	04/30/99	05/03/99
CHROMIUM VI	004	S	99LVI037	04/27/99	05/03/99	05/03/99
B0VD38						
% SOLIDS	005	S	99L%S060	04/27/99	04/30/99	05/03/99
CHROMIUM VI	005	S	99LVI037	04/27/99	05/03/99	05/03/99
B0VD39						
% SOLIDS	006	S	99L%S060	04/27/99	04/30/99	05/03/99
% SOLIDS	006 REP	S	99L%S060	04/27/99	04/30/99	05/03/99
CHROMIUM VI	006	S	99LVI037	04/27/99	05/03/99	05/03/99

LAB QC:

CHROMIUM VI	MB1	S	99LVI037	N/A	05/03/99	05/03/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-002

DATE RECEIVED: 04/29/99 RFW LOT # :9904L807

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	MB1 BS	S	99LVI037	N/A	05/03/99	05/03/99
CHROMIUM VI	MB1 BSD	S	99LVI037	N/A	05/03/99	05/03/99

009
~~010~~ 5/14/99

RECRA LabNet Use Only
99041807

Custody Transfer Record/Lab Work Request

RECRA LabNet

Client: TNU-Hanford B99-002
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: DJ
QC: spec Del: std TAT: 15 day
Date Rec'd: 4/29/99 Date Due: 5/14/99
Account #:

Refrigerator #									3	3							
#/Type Container	Liquid																
	Solid								1g	1g							
Volume	Liquid																
	Solid								125	250							
Preservatives																	
ANALYSES REQUESTED		ORGANIC								INORG							
		VOA	BNA	Pest/PCB	Herb					Metal	CN						
		RECRA LabNet Use Only															
									ICE6	Cr Pb Hg							

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	ICE6	Cr Pb Hg
001	B0VDB2			S	4/27/99	0830	✓	✓
2	B3					1045	✓	✓
3	36					0930	✓	✓
4	37					1000	✓	✓
5	38					1015	✓	✓
6	39					1015	✓	✓

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
saf# B99-002

COMPOSITE WASTE

DATE/REVISIONS:
1. Run matrix QC
2.
3.
4.
5.
6.

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

Discrepancies Between Samples Lables and COC Record? Y or N
NOTES:
*423579525290 - 3.3°C = cooler temp.

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	4/29/99	0930

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-002-93

Page 1 of 1

Collector: Fahlberg/Kerkow	Company Contact: R Coffman	Telephone No.: 373-6425	Project Coordinator: TRENT, SJ
Project Designation: 100 BC Areas - Full Protocol	Sampling Location: 100 B/C 116-B-6B		SAF No.: B99-002
Ice Chest No.: L0026 36165	Field Logbook No.: EL 1327-3		Method of Shipment: Fed. Ex
Shipped To: ~~TWA~~/RECRA RE. 4-27-99	Offsite Property No.: A990123		Bill of Lading/Air Bill No.: 4285795252 90 ~~R16B6B2600~~ 4/28/99 RJN
			COA: Fed Ex R16B6B2600

Price Code: copy

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

807

Special Handling and/or Storage

Preservation	None	None	Cool 4C	None	None							
Type of Container	P	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1	1							
Volume	20mL	60mL	125mL	250mL	1000mL							
SAMPLE ANALYSIS	Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.							

Sample No.	Matrix *	Sample Date	Sample Time										
B0VDB2	Soil	4.27.99	0830			X	X						
B0VDB3	Soil	4.27.99	1045			X	X				tie to B0VDX4		

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	4-27-99 1620	Ref 1-C	4-27-99 1620
Ref 1-C	4/28/99 ~~4/28/99~~ RJN 0930	Renee Nielsen / R Nielson	4/28/99 0930
Renee Nielsen / R Nielson	4/28/99 0930	Fed Ex	
Fed Ex		Jodler	4/29/99 0930

SPECIAL INSTRUCTIONS

(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-002-87

Collector Fahlberg/Kerkow	Company Contact R Coffman	Telephone No. 373-6425	Project Coordinator TRENT, SJ
Project Designation 100 BC Areas - Full Protocol	Sampling Location 100 B/C 116-B-6B		SAF No. B99-002
Ice Chest No. L0026 36 lbs	Field Logbook No. EL 1327-3		Method of Shipment Fed Ex
Shipped To ~~TMA~~/RECRA RF 4-27-99	Offsite Property No. A990123		Bill of Lading/Air Bill No. 4235795252 90
			COA R1bB6B2600

Price Code: copy

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	Cool 4C	None	None					
	Type of Container	P	aG	aG	aG	aG					
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1					
	Volume	20mL	60mL	125mL	250mL	1000mL					
SAMPLE ANALYSIS		Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.					

Sample No.	Matrix *	Sample Date	Sample Time										
B0VD36	Soil	4-27-99	0930			X	X				tie to B0V013		
B0VD37	Soil	4-27-99	1000			X	X					B0V016	
B0VD38	Soil	4-27-99	1015			X	X					B0V0W8	
B0VD39	Soil	4-27-99	1015			X	X					B0V0W8	

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By R. Fahlberg / R. Fahlberg 4-27-99	Date/Time 1620	Received By Ref 1-C 4-27-99
Relinquished By Ref 1-C 4/28/99	Date/Time 0930	Received By Renee Nielson / R. Nielson 4/28/99
Relinquished By Renee Nielson / R. Nielson 4/28/99	Date/Time 0930	Received By Fed Ex
Relinquished By Fedex	Date/Time	Received By Fedex 4/29/99 0930

SPECIAL INSTRUCTIONS

(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *

Soil
Water
Vapor
Other Solid
Other Liquid

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

H0393 - 1 MA/RLLRA

Thermo Nutech
W.O. No. N9-04-152-7118

Bechtel Hanford Inc.
SDG H0393

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0393 is comprised of six solid (soil) samples designated under SAF No. B99-002 with a Project Designation of: 100 BC Areas-Full Protocol.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklist. All results were reported by fax on May 19, 1999.

2.0 ANALYSIS NOTES

2.1 Nickel-63 Analyses
No problems were encountered during the processing of the samples.

2.2 Total Strontium Analyses
No problems were encountered during the processing of the samples.

2.3 Isotopic Plutonium Analyses
No problems were encountered during the processing of the samples.

2.4 Gamma Scan Analyses
No problems were encountered during the processing of the samples.

2.5 Isotopic Uranium Analyses
No problems were encountered during the processing of the samples.

2.6 Americium-241 Analyses
The aliquot for the analysis was reduced however this did not affect achieving the required LLD. No problems were encountered during the processing of the samples.

JUN 1999
RECEIVED
Data
Log In

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

SAMPLE SUMMARY

SDG 7118
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0VD36		SOLID		N904152-01	B99-002	B99-002-87	04/27/99 09:30
B0VD37	100 B/C 116-B-6B	SOLID		N904152-02	B99-002	B99-002-87	04/27/99 10:00
B0VD38	100 B/C 116-B-6B	SOLID		N904152-03	B99-002	B99-002-87	04/27/99 10:15
B0VD39	100 B/C 116-B-6B	SOLID		N904152-04	B99-002	B99-002-87	04/27/99 10:15
B0VDB2	100 B/C 116-B-6B	SOLID		N904152-05	B99-002	B99-002-93	04/27/99 08:30
B0VDB3	100 B/C 116-B-6B	SOLID		N904152-06	B99-002	B99-002-93	04/27/99 10:45
Method Blank		SOLID		N904152-08	B99-002		
Lab Control Sample		SOLID		N904152-07	B99-002		
Duplicate (N904152-01)		SOLID		N904152-09	B99-002		04/27/99 09:30

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

QC SUMMARY

SDG 7118
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

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
7118	B99-002-87	B0VD36	SOLID	95.1			04/29/99	2	N904152-01	7118-001
		B0VD37	SOLID	95.9			04/29/99	2	N904152-02	7118-002
		B0VD38	SOLID	95.1			04/29/99	2	N904152-03	7118-003
		B0VD39	SOLID	95.1			04/29/99	2	N904152-04	7118-004
	B99-002-93	B0VDB2	SOLID	99.9			04/29/99	2	N904152-05	7118-005
		B0VDB3	SOLID	97.2			04/29/99	2	N904152-06	7118-006
		Method Blank	SOLID						N904152-08	7118-008
		Lab Control Sample	SOLID						N904152-07	7118-007
		Duplicate (N904152-01)	SOLID	95.1			04/29/99	2	N904152-09	7118-009

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

PREP BATCH SUMMARY

SDG 7118
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

TEST	MATRIX	METHOD	PREPARATION ERROR BATCH	2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	6880-057	5.0	6			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6880-057	5.0	6			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	6880-057	5.0	6			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6880-057	10.0	6			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6880-057	15.0	6			1	1	1/1		
Liquid Scintillation Counting												
NI_L	SOLID	Nickel 63 in Soil	6880-057	10.0	6			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 06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

WORK SUMMARY

SDG 7118
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0VD36			N904152-01	7118-001	AM		05/15/99	05/19/99	TAH	Americium 241 in Soil
		SOLID	04/27/99	7118-001	GAM		05/05/99	05/19/99	TAH	Gamma Scan
B99-002-87	B99-002		04/29/99	7118-001	NI_L		05/12/99	05/19/99	TAH	Nickel 63 in Soil
				7118-001	PU		05/12/99	05/19/99	TAH	Plutonium, Isotopic in Solids
				7118-001	SR		05/12/99	05/19/99	TAH	Total Strontium in Soil
				7118-001	U		05/12/99	05/19/99	TAH	Uranium, Isotopic in Soil
B0VD37			N904152-02	7118-002	AM		05/15/99	05/19/99	TAH	Americium 241 in Soil
100 B/C 116-B-6B		SOLID	04/27/99	7118-002	GAM		05/05/99	05/19/99	TAH	Gamma Scan
B99-002-87	B99-002		04/29/99	7118-002	NI_L		05/12/99	05/19/99	TAH	Nickel 63 in Soil
				7118-002	PU		05/12/99	05/19/99	TAH	Plutonium, Isotopic in Solids
				7118-002	SR		05/12/99	05/19/99	TAH	Total Strontium in Soil
				7118-002	U		05/12/99	05/19/99	TAH	Uranium, Isotopic in Soil
B0VD38			N904152-03	7118-003	AM		05/15/99	05/19/99	TAH	Americium 241 in Soil
100 B/C 116-B-6B		SOLID	04/27/99	7118-003	GAM		05/05/99	05/19/99	TAH	Gamma Scan
B99-002-87	B99-002		04/29/99	7118-003	NI_L		05/12/99	05/19/99	TAH	Nickel 63 in Soil
				7118-003	PU		05/12/99	05/19/99	TAH	Plutonium, Isotopic in Solids
				7118-003	SR		05/12/99	05/19/99	TAH	Total Strontium in Soil
				7118-003	U		05/12/99	05/19/99	TAH	Uranium, Isotopic in Soil
B0VD39			N904152-04	7118-004	AM		05/15/99	05/19/99	TAH	Americium 241 in Soil
100 B/C 116-B-6B		SOLID	04/27/99	7118-004	GAM		05/06/99	05/19/99	TAH	Gamma Scan
B99-002-87	B99-002		04/29/99	7118-004	NI_L		05/12/99	05/19/99	TAH	Nickel 63 in Soil
				7118-004	PU		05/12/99	05/19/99	TAH	Plutonium, Isotopic in Solids
				7118-004	SR		05/12/99	05/19/99	TAH	Total Strontium in Soil
				7118-004	U		05/12/99	05/19/99	TAH	Uranium, Isotopic in Soil
B0VDB2			N904152-05	7118-005	AM		05/15/99	05/19/99	TAH	Americium 241 in Soil
100 B/C 116-B-6B		SOLID	04/27/99	7118-005	GAM		05/06/99	05/19/99	TAH	Gamma Scan
B99-002-93	B99-002		04/29/99	7118-005	NI_L		05/12/99	05/19/99	TAH	Nickel 63 in Soil
				7118-005	PU		05/12/99	05/19/99	TAH	Plutonium, Isotopic in Solids
				7118-005	SR		05/12/99	05/19/99	TAH	Total Strontium in Soil
				7118-005	U		05/12/99	05/19/99	TAH	Uranium, Isotopic in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

SDG 7118
Contact L.A. Johnson

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0VDB3			N904152-06	7118-006	AM		05/15/99	05/19/99	TAH	Americium 241 in Soil
100 B/C 116-B-6B		SOLID	04/27/99	7118-006	GAM		05/06/99	05/19/99	TAH	Gamma Scan
B99-002-93	B99-002		04/29/99	7118-006	NI_L		05/13/99	05/19/99	TAH	Nickel 63 in Soil
				7118-006	PU		05/12/99	05/19/99	TAH	Plutonium, Isotopic in Solids
				7118-006	SR		05/12/99	05/19/99	TAH	Total Strontium in Soil
				7118-006	U		05/12/99	05/19/99	TAH	Uranium, Isotopic in Soil
Method Blank			N904152-08	7118-008	AM		05/17/99	05/19/99	TAH	Americium 241 in Soil
		SOLID		7118-008	GAM		05/06/99	05/19/99	TAH	Gamma Scan
	B99-002			7118-008	NI_L		05/13/99	05/19/99	TAH	Nickel 63 in Soil
				7118-008	PU		05/12/99	05/19/99	TAH	Plutonium, Isotopic in Solids
				7118-008	SR		05/12/99	05/19/99	TAH	Total Strontium in Soil
				7118-008	U		05/12/99	05/19/99	TAH	Uranium, Isotopic in Soil
Lab Control Sample			N904152-07	7118-007	AM		05/15/99	05/19/99	TAH	Americium 241 in Soil
		SOLID		7118-007	GAM		05/06/99	05/19/99	TAH	Gamma Scan
	B99-002			7118-007	NI_L		05/13/99	05/19/99	TAH	Nickel 63 in Soil
				7118-007	PU		05/13/99	05/19/99	TAH	Plutonium, Isotopic in Solids
				7118-007	SR		05/12/99	05/19/99	TAH	Total Strontium in Soil
				7118-007	U		05/12/99	05/19/99	TAH	Uranium, Isotopic in Soil
Duplicate (N904152-01)			N904152-09	7118-009	AM		05/15/99	05/19/99	TAH	Americium 241 in Soil
		SOLID	04/27/99	7118-009	GAM		05/06/99	05/19/99	TAH	Gamma Scan
	B99-002		04/29/99	7118-009	NI_L		05/12/99	05/19/99	TAH	Nickel 63 in Soil
				7118-009	PU		05/13/99	05/19/99	TAH	Plutonium, Isotopic in Solids
				7118-009	SR		05/12/99	05/19/99	TAH	Total Strontium in Soil
				7118-009	U		05/12/99	05/19/99	TAH	Uranium, Isotopic in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

SDG 7118
Contact L.A. Johnson

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B99-002	Americium 241 in Soil	AM/CMPLATE	6			1	1	1	9
GAM	B99-002	Gamma Scan	GAMMAHI	6			1	1	1	9
NI_L	B99-002	Nickel 63 in Soil	NI63LSC	6			1	1	1	9
PU	B99-002	Plutonium, Isotopic in Solids	PUPLATE	6			1	1	1	9
SR	B99-002	Total Strontium in Soil		6			1	1	1	9
U	B99-002	Uranium, Isotopic in Soil	UPLATE	6			1	1	1	9
TOTALS				36			6	6	6	54

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

N904152-08 Method Blank

METHOD BLANK

SDG	7118	Client/Case no	Hanford SDG-H0393
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904152-08	Client sample id	Method Blank
Dept sample id	7118-008	Material/Matrix	SOLID
		SAF No	B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0	0.020	0.077	0.30	U	U
Uranium 235	15117-96-1	0	0.024	0.093	0.30	U	U
Uranium 238	U-238	0	0.020	0.077	0.30	U	U
Plutonium 238	13981-16-3	0	0.008	0.019	0.050	U	PU
Plutonium 239/240	PU-239/240	0.002	0.008	0.015	0.050	U	PU
Nickel 63	13981-37-8	-0.368	1.2	2.0	20	U	NI_L
Americium 241	14596-10-2	-0.002	0.014	0.029	0.050	U	AM
Total Strontium	SR-RAD	-0.011	0.13	0.20	1.0	U	SR
Potassium 40	13966-00-2	U		0.10		U	GAM
Cobalt 60	10198-40-0	U		0.010	0.050	U	GAM
Cesium 137	10045-97-3	U		0.008	0.050	U	GAM
Europium 152	14683-23-9	U		0.020	0.10	U	GAM
Europium 154	15585-10-1	U		0.030	0.10	U	GAM
Europium 155	14391-16-3	U		0.010	0.10	U	GAM
Americium 241	14596-10-2	U		0.006		U	GAM
Uranium 238	U-238	U		1.0		U	GAM
Uranium 235	15117-96-1	U		0.020		U	GAM

100 BC Areas-Full Protocol

QC-BLANK 30665

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

N904152-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7118
Contact L.A. Johnson

Client/Case no Hanford SDG-H0393
Case no TRB-SBB-207925

Lab sample id N904152-07
Dept sample id 7118-007

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B99-002

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
Uranium 233/234	5.05	0.60	0.27	0.30		U	4.75	0.19	106	79-121	80-120
Uranium 235	3.84	0.51	0.077	0.30		U	3.89	0.16	99	78-122	80-120
Uranium 238	5.12	0.60	0.26	0.30		U	4.90	0.20	104	79-121	80-120
Plutonium 238	4.83	0.33	0.018	0.050		PU	5.03	0.20	96	86-114	80-120
Plutonium 239/240	5.18	0.35	0.014	0.050		PU	5.29	0.21	98	86-114	80-120
Nickel 63	159	4.4	2.4	20		NI_L	134	5.4	119	81-119	
Americium 241	4.57	0.36	0.026	0.050		AM	4.79	0.19	95	85-115	80-120
Total Strontium	12.0	0.42	0.20	1.0		SR	11.4	0.46	105	82-118	
Cobalt 60	0.280	0.016	0.008	0.050		GAM	0.303	0.012	92	77-123	80-120
Cesium 137	0.320	0.013	0.008	0.050		GAM	0.347	0.014	92	78-122	80-120

100 BC Areas-Full Protocol

QC-LCS 30664

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

N904152-09

B0VD36

DUPLICATE

SDG	7118			Client/Case no	Hanford SDG-H0393
Contact	L.A. Johnson			Case no	TRB-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	N904152-09	Lab sample id	N904152-01	Client sample id	B0VD36
Dept sample id	7118-009	Dept sample id	7118-001	Location/Matrix	SOLID
		Received	04/29/99	Collected	04/27/99 09:30
% solids	95.1	% solids	95.1	Custody/SAF No	B99-002-87 B99-002

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 TOT	PROT LIMIT
Uranium 233/234	0.490	0.14	0.066	0.30		U	0.593	0.15	0.067		19	58	
Uranium 235	0.052	0.042	0.080	0.30	U	U	0.032	0.042	0.081	U	-		
Uranium 238	0.421	0.13	0.066	0.30		U	0.567	0.15	0.067		30	61	
Plutonium 238	-0.014	0.018	0.056	0.050	U	PU	0.012	0.023	0.042	U	-		
Plutonium 239/240	0.005	0.018	0.035	0.050	U	PU	-0.004	0.015	0.037	U	-		
Nickel 63	0.263	1.5	2.6	20	U	NI_L	-0.400	1.1	1.9	U	-		
Americium 241	0.024	0.029	0.046	0.050	U	AM	0.005	0.028	0.045	U	-		
Total Strontium	-0.070	0.12	0.20	1.0	U	SR	-0.035	0.13	0.22	U	-		
Potassium 40	12.0	0.43	0.20			GAM	12.5	0.43	0.19		4	33	
Cobalt 60	U		0.020	0.050	U	GAM	U		0.022	U	-		
Cesium 137	U		0.050	0.050	U	GAM	U		0.021	U	-		
Europium 152	U		0.050	0.10	U	GAM	U		0.044	U	-		
Europium 154	U		0.060	0.10	U	GAM	U		0.070	U	-		
Europium 155	U		0.050	0.10	U	GAM	U		0.058	U	-		
Radium 226	0.430	0.037	0.040	0.10		GAM	0.424	0.037	0.035		1	37	
Radium 228	0.730	0.094	0.090	0.20		GAM	0.784	0.10	0.093		7	42	
Thorium 228	0.630	0.024	0.020			GAM	0.637	0.022	0.020		1	33	
Thorium 232	0.730	0.094	0.090			GAM	0.784	0.10	0.093		7	42	
Americium 241	U		0.070		U	GAM	U		0.025	U	-		
Uranium 238	U		2.0		U	GAM	U		2.6	U	-		
Uranium 235	U		0.10		U	GAM	U		0.064	U	-		

100 BC Areas-Full Protocol

QC-DUP#1 30666

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	06/01/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0393

N904152-01

B0VD36

DATA SHEET

SDG	7118	Client/Case no	Hanford SDG-H0393
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904152-01	Client sample id	B0VD36
Dept sample id	7118-001	Location/Matrix	SOLID
Received	04/29/99	Collected	04/27/99 09:30
% solids	95.1	Custody/SAF No	B99-002-87 B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.593	0.15	0.067	0.30		U
Uranium 235	15117-96-1	0.032	0.042	0.081	0.30	U	U
Uranium 238	U-238	0.567	0.15	0.067	0.30		U
Plutonium 238	13981-16-3	0.012	0.023	0.042	0.050	U	PU
Plutonium 239/240	PU-239/240	-0.004	0.015	0.037	0.050	U	PU
Nickel 63	13981-37-8	-0.400	1.1	1.9	20	U	NI_L
Americium 241	14596-10-2	0.005	0.028	0.045	0.050	U	AM
Total Strontium	SR-RAD	-0.035	0.13	0.22	1.0	U	SR
Potassium 40	13966-00-2	12.5	0.43	0.19			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	U		0.021	0.050	U	GAM
Europium 152	14683-23-9	U		0.044	0.10	U	GAM
Europium 154	15585-10-1	U		0.070	0.10	U	GAM
Europium 155	14391-16-3	U		0.058	0.10	U	GAM
Radium 226	13982-63-3	0.424	0.037	0.035	0.10		GAM
Radium 228	15262-20-1	0.784	0.10	0.093	0.20		GAM
Thorium 228	14274-82-9	0.637	0.022	0.020			GAM
Thorium 232	TH-232	0.784	0.10	0.093			GAM
Americium 241	14596-10-2	U		0.025		U	GAM
Uranium 238	U-238	U		2.6		U	GAM
Uranium 235	15117-96-1	U		0.064		U	GAM

100 BC Areas-Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
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SAMPLE DELIVERY GROUP H0393

N904152-02

B0VD37

DATA SHEET

SDG	7118	Client/Case no	Hanford	SDG-H0393
Contact	L.A. Johnson	Case no	TRB-SBB-207925	
Lab sample id	N904152-02	Client sample id	B0VD37	
Dept sample id	7118-002	Location/Matrix	100 B/C 116-B-6B	SOLID
Received	04/29/99	Collected	04/27/99 10:00	
% solids	95.9	Custody/SAF No	B99-002-87	B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.559	0.14	0.061	0.30		U
Uranium 235	15117-96-1	0.048	0.039	0.074	0.30	U	U
Uranium 238	U-238	0.392	0.12	0.061	0.30		U
Plutonium 238	13981-16-3	-0.008	0.015	0.047	0.050	U	PU
Plutonium 239/240	PU-239/240	0.011	0.015	0.029	0.050	U	PU
Nickel 63	13981-37-8	-0.471	1.4	2.5	20	U	NI_L
Americium 241	14596-10-2	-0.011	0.034	0.069	0.050	U	AM
Total Strontium	SR-RAD	0.033	0.12	0.20	1.0	U	SR
Potassium 40	13966-00-2	13.5	0.44	0.21			GAM
Cobalt 60	10198-40-0	U		0.020	0.050	U	GAM
Cesium 137	10045-97-3	0.030	0.019	0.022	0.050	J	GAM
Europium 152	14683-23-9	U		0.046	0.10	U	GAM
Europium 154	15585-10-1	U		0.063	0.10	U	GAM
Europium 155	14391-16-3	U		0.050	0.10	U	GAM
Radium 226	13982-63-3	0.460	0.034	0.035	0.10		GAM
Radium 228	15262-20-1	0.767	0.093	0.094	0.20		GAM
Thorium 228	14274-82-9	0.698	0.025	0.022			GAM
Thorium 232	TH-232	0.767	0.093	0.094			GAM
Americium 241	14596-10-2	U		0.075		U	GAM
Uranium 238	U-238	U		2.3		U	GAM
Uranium 235	15117-96-1	U		0.081		U	GAM

100 BC Areas-Full Protocol

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SAMPLE DELIVERY GROUP H0393

N904152-03

B0VD38

DATA SHEET

SDG	7118	Client/Case no	Hanford SDG-H0393
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904152-03	Client sample id	B0VD38
Dept sample id	7118-003	Location/Matrix	100 B/C 116-B-6B SOLID
Received	04/29/99	Collected	04/27/99 10:15
% solids	95.1	Custody/SAF No	B99-002-87 B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.530	0.14	0.065	0.30		U
Uranium 235	15117-96-1	0.031	0.042	0.079	0.30	U	U
Uranium 238	U-238	0.590	0.15	0.065	0.30		U
Plutonium 238	13981-16-3	0	0.017	0.041	0.050	U	PU
Plutonium 239/240	PU-239/240	0.004	0.017	0.033	0.050	U	PU
Nickel 63	13981-37-8	-2.09	1.3	2.4	20	U	NI_L
Americium 241	14596-10-2	-0.013	0.026	0.073	0.050	U	AM
Total Strontium	SR-RAD	0.023	0.12	0.17	1.0	U	SR
Potassium 40	13966-00-2	13.0	0.26	0.10			GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	0.025	0.007	0.010	0.050	J	GAM
Europium 152	14683-23-9	U		0.026	0.10	U	GAM
Europium 154	15585-10-1	U		0.035	0.10	U	GAM
Europium 155	14391-16-3	U		0.039	0.10	U	GAM
Radium 226	13982-63-3	0.440	0.022	0.021	0.10		GAM
Radium 228	15262-20-1	0.690	0.053	0.051	0.20		GAM
Thorium 228	14274-82-9	0.650	0.015	0.014			GAM
Thorium 232	TH-232	0.690	0.053	0.051			GAM
Americium 241	14596-10-2	U		0.035		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Uranium 235	15117-96-1	U		0.057		U	GAM

100 BC Areas-Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
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SAMPLE DELIVERY GROUP H0393

N904152-04 B0VD39

DATA SHEET

SDG	7118	Client/Case no	Hanford SDG-H0393
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904152-04	Client sample id	B0VD39
Dept sample id	7118-004	Location/Matrix	100 B/C 116-B-6B SOLID
Received	04/29/99	Collected	04/27/99 10:15
% solids	95.1	Custody/SAF No	B99-002-87 B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.404	0.14	0.084	0.30		U
Uranium 235	15117-96-1	0.013	0.026	0.10	0.30	U	U
Uranium 238	U-238	0.644	0.19	0.084	0.30		U
Plutonium 238	13981-16-3	0.006	0.033	0.061	0.050	U	PU
Plutonium 239/240	PU-239/240	0.006	0.022	0.042	0.050	U	PU
Nickel 63	13981-37-8	-0.220	1.4	2.4	20	U	NI_L
Americium 241	14596-10-2	-0.007	0.028	0.066	0.050	U	AM
Total Strontium	SR-RAD	-0.056	0.11	0.17	1.0	U	SR
Potassium 40	13966-00-2	12.5	0.51	0.25			GAM
Cobalt 60	10198-40-0	U		0.023	0.050	U	GAM
Cesium 137	10045-97-3	U		0.024	0.050	U	GAM
Europium 152	14683-23-9	U		0.058	0.10	U	GAM
Europium 154	15585-10-1	U		0.074	0.10	U	GAM
Europium 155	14391-16-3	U		0.073	0.10	U	GAM
Radium 226	13982-63-3	0.455	0.047	0.045	0.10		GAM
Radium 228	15262-20-1	0.691	0.084	0.081	0.20		GAM
Thorium 228	14274-82-9	0.632	0.028	0.027			GAM
Thorium 232	TH-232	0.691	0.084	0.081			GAM
Americium 241	14596-10-2	U		0.088		U	GAM
Uranium 238	U-238	U		2.9		U	GAM
Uranium 235	15117-96-1	0.087	0.063	0.091		U	GAM

100 BC Areas-Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
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SAMPLE DELIVERY GROUP H0393

N904152-05 B0VDB2

DATA SHEET

SDG	7118	Client/Case no	Hanford SDG-H0393
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904152-05	Client sample id	B0VDB2
Dept sample id	7118-005	Location/Matrix	100 B/C 116-B-6B SOLID
Received	04/29/99	Collected	04/27/99 08:30
% solids	99.9	Custody/SAF No	B99-002-93 B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.204	0.083	0.062	0.30	J	U
Uranium 235	15117-96-1	0	0.020	0.075	0.30	U	U
Uranium 238	U-238	0.155	0.066	0.062	0.30	J	U
Plutonium 238	13981-16-3	-0.004	0.015	0.043	0.050	U	PU
Plutonium 239/240	PU-239/240	0.008	0.015	0.030	0.050	U	PU
Nickel 63	13981-37-8	-1.28	1.1	1.9	20	U	NI_L
Americium 241	14596-10-2	0.004	0.024	0.039	0.050	U	AM
Total Strontium	SR-RAD	-0.035	0.14	0.19	1.0	U	SR
Potassium 40	13966-00-2	5.10	0.18	0.064			GAM
Cobalt 60	10198-40-0	U		0.008	0.050	U	GAM
Cesium 137	10045-97-3	U		0.007	0.050	U	GAM
Europium 152	14683-23-9	U		0.019	0.10	U	GAM
Europium 154	15585-10-1	U		0.027	0.10	U	GAM
Europium 155	14391-16-3	U		0.021	0.10	U	GAM
Radium 226	13982-63-3	0.135	0.015	0.015	0.10		GAM
Radium 228	15262-20-1	0.176	0.036	0.037	0.20	J	GAM
Thorium 228	14274-82-9	0.172	0.009	0.009			GAM
Thorium 232	TH-232	0.176	0.036	0.037			GAM
Americium 241	14596-10-2	U		0.024		U	GAM
Uranium 238	U-238	U		0.95		U	GAM
Uranium 235	15117-96-1	U		0.032		U	GAM

100 BC Areas-Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

N904152-06

B0VDB3

DATA SHEET

SDG	7118	Client/Case no	Hanford SDG-H0393
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N904152-06	Client sample id	B0VDB3
Dept sample id	7118-006	Location/Matrix	100 B/C 116-B-6B SOLID
Received	04/29/99	Collected	04/27/99 10:45
% solids	97.2	Custody/SAF No	B99-002-93 B99-002

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.440	0.13	0.061	0.30		U
Uranium 235	15117-96-1	0.029	0.039	0.074	0.30	U	U
Uranium 238	U-238	0.624	0.15	0.061	0.30		U
Plutonium 238	13981-16-3	-0.003	0.014	0.039	0.050	U	PU
Plutonium 239/240	PU-239/240	-0.003	0.014	0.033	0.050	U	PU
Nickel 63	13981-37-8	-0.886	1.9	3.3	20	U	NI_L
Americium 241	14596-10-2	0.017	0.035	0.064	0.050	U	AM
Total Strontium	SR-RAD	-0.071	0.11	0.16	1.0	U	SR
Potassium 40	13966-00-2	12.3	0.53	0.30			GAM
Cobalt 60	10198-40-0	U		0.021	0.050	U	GAM
Cesium 137	10045-97-3	U		0.022	0.050	U	GAM
Europium 152	14683-23-9	U		0.057	0.10	U	GAM
Europium 154	15585-10-1	U		0.072	0.10	U	GAM
Europium 155	14391-16-3	U		0.060	0.10	U	GAM
Radium 226	13982-63-3	0.400	0.043	0.044	0.10		GAM
Radium 228	15262-20-1	0.644	0.11	0.11	0.20		GAM
Thorium 228	14274-82-9	0.629	0.030	0.029			GAM
Thorium 232	TH-232	0.644	0.11	0.11			GAM
Americium 241	14596-10-2	U		0.087		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Uranium 235	15117-96-1	U		0.094		U	GAM

100 BC Areas-Full Protocol

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

Test AM Matrix SOLID
SDG 7118
Contact L.A. Johnson

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241	
Preparation batch 6880-057						
B0VD36	N904152-01			7118-001	U	
B0VD37	N904152-02			7118-002	U	
B0VD38	N904152-03			7118-003	U	
B0VD39	N904152-04			7118-004	U	
B0VDB2	N904152-05			7118-005	U	
B0VDB3	N904152-06			7118-006	U	
BLK (QC ID=30665)	N904152-08			7118-008	U	
LCS (QC ID=30664)	N904152-07			7118-007	ok	
Duplicate (N904152-01)	N904152-09			7118-009	-	U

Nominal values and limits from method RDLs (pCi/g) 0.050
100 BC Areas-Full Protocol

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 6880-057 2σ prep error 5.0 % Reference Lab Notebook 6880 pg.57																
B0VD36	N904152-01			0.045	0.500			70		722			18	05/15/99	05/15	SS-059
B0VD37	N904152-02			0.069	0.500			56		722			18	05/15/99	05/15	SS-060
B0VD38	N904152-03			0.073	0.500			48		722			18	05/15/99	05/15	SS-061
B0VD39	N904152-04			0.066	0.500			48		722			18	05/15/99	05/15	SS-062
B0VDB2	N904152-05			0.039	0.500			80		722			18	05/15/99	05/15	SS-063
B0VDB3	N904152-06			0.064	0.500			57		722			18	05/15/99	05/15	SS-064
BLK (QC ID=30665)	N904152-08			0.029	1.00			71		995				05/15/99	05/17	SS-009
LCS (QC ID=30664)	N904152-07			0.026	1.00			68		722				05/15/99	05/15	SS-065
Duplicate (N904152-01) (QC ID=30666)	N904152-09			0.046	0.500			67		722			18	05/15/99	05/15	SS-066
Nominal values and limits from method				0.050	1.00			20-105		700	100		180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

Test	AM
Matrix	SOLID
SDG	7118
Contact	L.A. Johnson

METHOD SUMMARY, cont.

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0393

PROCEDURES	REFERENCE	AM/CMPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-960	Americium-Curium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA	0.051	±	0.035
FOR 9 SAMPLES	YIELD	63	±	22

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

Test PU Matrix SOLID
SDG 7118
Contact L.A. Johnson

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 6880-057								
B0VD36	N904152-01			7118-001	U		U	
B0VD37	N904152-02			7118-002	U		U	
B0VD38	N904152-03			7118-003	U		U	
B0VD39	N904152-04			7118-004	U		U	
B0VDB2	N904152-05			7118-005	U		U	
B0VDB3	N904152-06			7118-006	U		U	
BLK (QC ID=30665)	N904152-08			7118-008	U		U	
LCS (QC ID=30664)	N904152-07			7118-007	ok		ok	
Duplicate (N904152-01)	N904152-09			7118-009	-	U	-	U
Nominal values and limits from method 100 BC Areas-Full Protocol				RDLs (pCi/g)	0.050		0.050	

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 6880-057 2σ prep error 5.0 % Reference Lab Notebook 6880 pg.57																
B0VD36	N904152-01			0.042	0.500			92		670			15	05/12/99	05/12	SS-043
B0VD37	N904152-02			0.047	0.500			93		670			15	05/12/99	05/12	SS-044
B0VD38	N904152-03			0.041	0.500			82		670			15	05/12/99	05/12	SS-045
B0VD39	N904152-04			0.061	0.500			67		670			15	05/12/99	05/12	SS-035
B0VDB2	N904152-05			0.043	0.500			88		669			15	05/12/99	05/12	SS-061
B0VDB3	N904152-06			0.039	0.500			98		669			15	05/12/99	05/12	SS-065
BLK (QC ID=30665)	N904152-08			0.019	1.00			87		669				05/12/99	05/12	SS-066
LCS (QC ID=30664)	N904152-07			0.018	1.00			79		959				05/12/99	05/13	SS-061
Duplicate (N904152-01) (QC ID=30666)	N904152-09			0.056	0.500			60		864			16	05/12/99	05/13	SS-006
Nominal values and limits from method				0.050	1.00			20-105		10	100		180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

Test	PU
Matrix	SOLID
SDG	7118
Contact	L.A. Johnson

METHOD SUMMARY, cont.

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0393

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	MDA	0.041	±	0.029
FOR 9 SAMPLES	YIELD	83	±	25

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	06/01/99

Test U Matrix SOLID
SDG 7118
Contact L.A. Johnson

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1+3	2σ	2+3	2σ
Preparation batch 6880-057											
B0VD36	N904152-01			7118-001	0.593	U	0.567	105	38	6	8
B0VD37	N904152-02			7118-002	0.559	U	0.392	143	56	12	11
B0VD38	N904152-03			7118-003	0.530	U	0.590	90	33	5	7
B0VD39	N904152-04			7118-004	0.404	U	0.644	63	29	2	4
B0VDB2	N904152-05			7118-005	0.204 J	U	0.155 J	132	77	0	13
B0VDB3	N904152-06			7118-006	0.440	U	0.624	71	27	5	6
BLK (QC ID=30665)	N904152-08			7118-008	U	U	U				
LCS (QC ID=30664)	N904152-07			7118-007	ok	ok	ok				
Duplicate (N904152-01)	N904152-09			7118-009	ok	- U	ok	116	49	12	11
Nominal values and limits from method				RDLs (pCi/g)	0.30	0.30	0.30	100		4	
100 BC Areas-Full Protocol								Averages 103		6	

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 6880-057	2σ prep error 5.0 %			Reference Lab Notebook 6880 pg.57												
B0VD36	N904152-01			0.081	1.00			83		157			15	05/10/99	05/12	SS-003
B0VD37	N904152-02			0.074	1.00			93		157			15	05/10/99	05/12	SS-005
B0VD38	N904152-03			0.079	1.00			87		157			15	05/10/99	05/12	SS-006
B0VD39	N904152-04			0.10	1.00			70		157			15	05/10/99	05/12	SS-007
B0VDB2	N904152-05			0.075	1.00			93		157			15	05/10/99	05/12	SS-008
B0VDB3	N904152-06			0.074	1.00			96		157			15	05/10/99	05/12	SS-009
BLK (QC ID=30665)	N904152-08			0.093	1.00			76		157				05/10/99	05/12	SS-011
LCS (QC ID=30664)	N904152-07			0.27	1.00			90		157				05/10/99	05/12	SS-010
Duplicate (N904152-01) (QC ID=30666)	N904152-09			0.080	1.00			88		157			15	05/10/99	05/12	SS-012
Nominal values and limits from method				0.30	1.00			30-105		150	100		180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

Test	U
Matrix	SOLID
SDG	7118
Contact	L.A. Johnson

METHOD SUMMARY, cont.

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0393

PROCEDURES	REFERENCE	UPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-910	Uranium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD	MDA	0.10	±	0.13
FOR 9 SAMPLES	YIELD	86	±	17

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

Test SR	Matrix SOLID
SDG 7118	
Contact L.A. Johnson	

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG-H0393	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium	
Preparation batch 6880-057						
B0VD36	N904152-01			7118-001	U	
B0VD37	N904152-02			7118-002	U	
B0VD38	N904152-03			7118-003	U	
B0VD39	N904152-04			7118-004	U	
B0VDB2	N904152-05			7118-005	U	
B0VDB3	N904152-06			7118-006	U	
BLK (QC ID=30665)	N904152-08			7118-008	U	
LCS (QC ID=30664)	N904152-07			7118-007	ok	
Duplicate (N904152-01)	N904152-09			7118-009	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.0	
100 BC Areas-Full Protocol						

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 6880-057	2σ prep error 10.0 % Reference Lab Notebook 6880 pg.57															
B0VD36	N904152-01			0.22	1.00			80		200			15	05/11/99	05/12	GRB-204
B0VD37	N904152-02			0.20	1.00			85		200			15	05/11/99	05/12	GRB-229
B0VD38	N904152-03			0.17	1.00			87		400			15	05/11/99	05/12	GRB-229
B0VD39	N904152-04			0.17	1.00			81		400			15	05/11/99	05/12	GRB-230
B0VDB2	N904152-05			0.19	1.00			75		400			15	05/11/99	05/12	GRB-231
B0VDB3	N904152-06			0.16	1.00			91		400			15	05/11/99	05/12	GRB-232
BLK (QC ID=30665)	N904152-08			0.20	1.00			79		400				05/11/99	05/12	GRB-202
LCS (QC ID=30664)	N904152-07			0.20	1.00			75		400				05/11/99	05/12	GRB-201
Duplicate (N904152-01) (QC ID=30666)	N904152-09			0.20	1.00			84		400			15	05/11/99	05/12	GRB-203
Nominal values and limits from method				1.0	1.00					100			180			

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

Test SR	Matrix SOLID
SDG 7118	
Contact L.A. Johnson	

METHOD SUMMARY, cont.

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG-H0393	

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

AVERAGES ± 2 SD	MDA	0.19	±	0.039
FOR 9 SAMPLES	YIELD	82	±	11

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

Test	GAM
Matrix	SOLID
SDG	7118
Contact	L.A. Johnson

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG-H0393

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6880-057						
B0VD36	N904152-01			7118-001	U	U
B0VD37	N904152-02			7118-002	U	0.030 J
B0VD38	N904152-03			7118-003	U	0.025 J
B0VD39	N904152-04			7118-004	U	U
B0VDB2	N904152-05			7118-005	U	U
B0VDB3	N904152-06			7118-006	U	U
BLK (QC ID=30665)	N904152-08			7118-008	U	U
LCS (QC ID=30664)	N904152-07			7118-007	ok	ok
Duplicate (N904152-01)	N904152-09			7118-009	- U	- U
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.050
100 BC Areas-Full Protocol						

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 6880-057 2σ prep error 15.0 % Reference Lab Notebook 6880 pg.57																
B0VD36	N904152-01			0.057	761					609			8	05/04/99	05/05	02,01,00
B0VD37	N904152-02			0.050	744					609			8	05/04/99	05/05	02,03,00
B0VD38	N904152-03			0.029	749					608			8	05/04/99	05/05	02,04,00
B0VD39	N904152-04			0.057	704					441			9	05/04/99	05/06	02,03,00
B0VDB2	N904152-05			0.021	865					441			9	05/04/99	05/06	02,04,00
B0VDB3	N904152-06			0.059	758					404			9	05/04/99	05/06	02,03,00
BLK (QC ID=30665)	N904152-08			0.020	750					650				05/04/99	05/06	01,01,00
LCS (QC ID=30664)	N904152-07			0.008	750					404				05/04/99	05/06	01,04,00
Duplicate (N904152-01) (QC ID=30666)	N904152-09			0.050	761					582			9	05/04/99	05/06	02,03,00
Nominal values and limits from method				0.050	750					100			180			

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

Test GAM Matrix SOLID	Client Hanford
SDG 7118	Contract TRB-SBB-207925
Contact L.A. Johnson	Case no SDG-H0393

METHOD SUMMARY, cont.

GAMMA SCAN

GAMMA SPECTROSCOPY

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

AVERAGES ± 2 SD	MDA	0.039 ± 0.039
FOR 9 SAMPLES	YIELD	±

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

Test NI L Matrix SOLID
SDG 7118
Contact L.A. Johnson

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63	
Preparation batch 6880-057						
B0VD36	N904152-01			7118-001	U	
B0VD37	N904152-02			7118-002	U	
B0VD38	N904152-03			7118-003	U	
B0VD39	N904152-04			7118-004	U	
B0VDB2	N904152-05			7118-005	U	
B0VDB3	N904152-06			7118-006	U	
BLK (QC ID=30665)	N904152-08			7118-008	U	
LCS (QC ID=30664)	N904152-07			7118-007	ok	
Duplicate (N904152-01)	N904152-09			7118-009	-	U
Nominal values and limits from method				RDLs (pCi/g)	20	
100 BC Areas-Full Protocol						

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 6880-057	2σ prep error 10.0 % Reference Lab Notebook 6880 pg.57															
B0VD36	N904152-01			1.9	0.500			95		100			15	05/11/99	05/12	LSC-005
B0VD37	N904152-02			2.5	0.500			73		100			15	05/11/99	05/12	LSC-005
B0VD38	N904152-03			2.4	0.500			77		100			15	05/11/99	05/12	LSC-005
B0VD39	N904152-04			2.4	0.500			74		100			15	05/11/99	05/12	LSC-005
B0VDB2	N904152-05			1.9	0.500			92		100			15	05/11/99	05/12	LSC-005
B0VDB3	N904152-06			3.3	0.500			56		100			16	05/11/99	05/13	LSC-005
BLK (QC ID=30665)	N904152-08			2.0	0.500			90		100				05/11/99	05/13	LSC-005
LCS (QC ID=30664)	N904152-07			2.4	0.500			74		100				05/11/99	05/13	LSC-005
Duplicate (N904152-01) (QC ID=30666)	N904152-09			2.6	0.500			71		100			15	05/11/99	05/12	LSC-005
Nominal values and limits from method				20	0.500					10			180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/01/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0393

Test NI L Matrix SOLID
SDG 7118
Contact L.A. Johnson

METHOD SUMMARY, cont.

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

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

AVERAGES ± 2 SD	MDA	2.4	±	0.87
FOR 9 SAMPLES	YIELD	78	±	25

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 06/01/99

SDG 7118
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

SAMPLE SUMMARY

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

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

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

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

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/01/99

SDG 7118
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/01/99

SDG 7118
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

WORK SUMMARY

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

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/01/99

SDG 7118
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

DATA SHEET

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

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

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

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

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

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DATA SHEET

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

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

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

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

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

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

The following values are underlined to indicate possible problems:

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

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Version 3.06
Report date 06/01/99

SDG 7118
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GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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Version Ver 1.0
Form DVD-RG
Version 3.06
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SDG 7118
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

LAB CONTROL SAMPLE

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

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

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

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

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

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

  2. The error of ADDED.

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

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

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Version Ver 1.0
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Version 3.06
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REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

  This value reported for this limit is at most 999.

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

  1. A fixed percentage specified in the protocol.

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DUPLICATE

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

* The RPD is underlined if it is greater than either limit.

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

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

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

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REPORT GUIDE

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MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

* The first, computed limits for the recovery reflect:

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

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

  2. The error of ADDED.

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

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

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GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0393

MATRIX SPIKE

for the recovery.

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

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

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REPORT GUIDE

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Contract TRB-SBB-207925
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METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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METHOD SUMMARY

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

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

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

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

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

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

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

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Case no SDG-H0393

METHOD SUMMARY

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

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

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

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 06/01/99

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-002-87

Collector: Fahlberg/Kerkow	Company Contact: R Coffman	Telephone No.: 373-6425	Project Coordinator: TRENT, SJ
Price Code: copy	Data Turnaround: 15 Days		
Project Designation: 100 BC Areas - Full Protocol	Sampling Location: 100 B/C 116-B-6B		SAF No.: B99-002
Ice Chest No.: # 740 37 lbs.	Field Logbook No.: EL 1327-3		Method of Shipment: Fed Ex
Shipped To: TMA/~~RCRA~~ RC 4.27.99	Offsite Property No.: A990124		Bill of Lading/Air Bill No.: 4235 7952 5305
			COA: R1686B2600

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	None	Cool 4C	None	None						
Type of Container	P	aG	aG	aG	aG						
No. of Container(s)	1	1	1	1	1						
Volume	20mL	60mL	125mL	250mL	1000mL						
SAMPLE ANALYSIS	Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.						
Sample No.	Matrix *	Sample Date	Sample Time								
B0VD36	Soil	4.27.99	0930	X	X			X			tieto B0V0B3
B0VD37	Soil	4.27.99	1000	X	X			X			B0V016
B0VD38	Soil	4.27.99	1015	X	X			X			B0V0W8
B0VD39	Soil	4.27.99	1015	X	X			X			B0V0W8

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: R Fahlberg / R Fahlberg 4.27.99	Date/Time: 1620	Received By: Ref 1-C	Date/Time: 1620 4.27.99
Relinquished By: Ref 1-C 4/28/99	Date/Time: 0930	Received By: R Nielson / R. Nielson 4/28/99	Date/Time: 0930
Relinquished By: R Nielson / R. Nielson 4/28/99	Date/Time: 0930	Received By: Fed Ex	Date/Time: 4/28/99
Relinquished By: Fed Ex	Date/Time: 4/29/99 10:15	Received By: TNU M. Goldenberg	Date/Time: 4/29/99 10:15

SPECIAL INSTRUCTIONS

(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-002-93 | Page 1 of 1

Collector: Fahlberg/Kerkow	Company Contact: R Coffman	Telephone No.: 373-6425	Project Coordinator: TRENT, SJ
Price Code: copy	Data Turnaround: 15 Days		
Project Designation: 100 BC Areas - Full Protocol	Sampling Location: 100 B/C 116-B-6B		SAF No.: B99-002
Ice Chest No.: #740 37 lbs.	Field Logbook No.: EL 1327-3		Method of Shipment: FedEx
Shipped To: ~~TMA/RECRA~~ RS 4.27.99	Offsite Property No.: A990124		Bill of Lading/Air Bill No.: 4235795253 05
			COA: R16B6B2600

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	None	None	Cool 4C	None	None					
	Type of Container	P	aG	aG	aG	aG					
	No. of Container(s)	1	1	1	1	1					
Special Handling and/or Storage	Volume	20mL	60mL	125mL	250mL	1000mL					
SAMPLE ANALYSIS		Activity Scan	See item (1) in Special Instructions	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions					
Sample No.	Matrix *	Sample Date	Sample Time								
✓ B0VDB2	Soil	4-27-99	0830	X*	X*			X*			
✓ B0VDB3	Soil	4-27-99	1045	X*	X*			X*			tie to B0VOX4

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: R Fahlberg / R. Fahlberg 4.27.99	Date/Time: 1620	Received By: Ref I-C	Date/Time: 1620 4-27-99
Relinquished By: Ref I-C 4/28/99	Date/Time: 0930	Received By: Renee Nielson / R. Nielson 4/28/99	Date/Time: 0930
Relinquished By: Renee Nielson / R. Nielson 4/28/99	Date/Time: 0930	Received By: Fed Ex	Date/Time: 4/28/99
Relinquished By: FedEx	Date/Time: 4/29/99 10.15	Received By: TNU M. Goldenberg	Date/Time: 4/29/99 10:15

SPECIAL INSTRUCTIONS

(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *
- Soil
- Water
- Vapor
- Other Solid
- Other Liquid

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

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Date/Time received 4/29/99 10:15

CoC No. B99-002-87, B99-002-93

Container I.D. No. 740 Requested TAT (Days) 15 P.O. Received Yes [ ] No [✓]

INSPECTION

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

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by M. Goldenberg Date: 4/29/99 Time: 10:15

LOGIN

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

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____