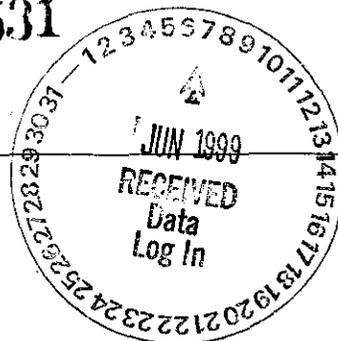




a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

0051531



Recra LabNet Philadelphia Analytical Report

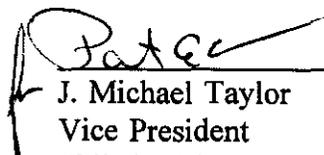
Client : TNU-HANFORD B99-001
RFW# : 9904L737
SDG# : H0388
SAF# : B99-001

W.O. # : 10985-001-001-9999-00
Date Received: 04-22-99



INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 2 soil samples.
2. The samples were prepared and analyzed in accordance with the methods indicated in 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 Chromium VI was within method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits.
7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.
8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.
9. Results for solid samples are reported on a dry weight basis.



 J. Michael Taylor
 Vice President
 Philadelphia Analytical Laboratory

5-20-99
 Date

njp04-737

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 10 pages.

WET CHEMISTRY METHODS GLOSSARY FOR ANALYSIS OF SOIL/SOLID SAMPLES

	<u>ASTM</u>	<u>SW846</u>	<u>OTHER</u>
%Ash	_ D2216-80		
%Moisture	_ D2216-80		_ ILMO4.0 (e)
%Solids			_ <input checked="" type="checkbox"/> 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

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.

RFW 21-21L-034/D-06/96

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 05/03/99

CLIENT: TNU-HANFORD B99-001

RECRA LOT #: 9904L737

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BOV838	% Solids	94.7	%	0.01	1.0
		Chromium VI	5.9	MG/KG	0.42	1.0
-002	BOV839	% Solids	94.7	%	0.01	1.0
		Chromium VI	15.0	MG/KG	0.42	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/03/99

CLIENT: TNU-HANFORD B99-001
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9904L737

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVI036-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 05/03/99

CLIENT: TNU-HANFORD B99-001

RECRA LOT #: 9904L737

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	BOV839	Soluble Chromium VI	21.1	15.0	6.3	95.9	1.5
		Insoluble Chromium VI	1400	15.0	1360	102.0	100
BLANK10	99LVI036-MB1	Soluble Chromium VI	4.2	0.40u	4.0	104.6	1.0
		Insoluble Chromium VI	1260	0.40u	1160	108.3	100

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 05/03/99

CLIENT: TNU-HANFORD B99-001
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9904L737

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-002REP	BOV239	% Solids	94.7	94.5	0.21	1.0
		Chromium VI	15.0	15.0	0.25	1.0

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-001

DATE RECEIVED: 04/22/99

RFW LOT # :9904L737

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOV838						
% SOLIDS	001	S	99L&S056	04/19/99	04/23/99	04/26/99
CHROMIUM VI	001	S	99LVI036	04/19/99	04/28/99	04/28/99
BOV839						
% SOLIDS	002	S	99L&S056	04/19/99	04/23/99	04/26/99
% SOLIDS	002 REP	S	99L&S056	04/19/99	04/23/99	04/26/99
CHROMIUM VI	002	S	99LVI036	04/19/99	04/28/99	04/28/99
CHROMIUM VI	002 REP	S	99LVI036	04/19/99	04/28/99	04/28/99
CHROMIUM VI	002 MS	S	99LVI036	04/19/99	04/28/99	04/28/99
CHROMIUM VI	002 MSD	S	99LVI036	04/19/99	04/28/99	04/28/99

LAB QC:

CHROMIUM VI	MB1	S	99LVI036	N/A	04/28/99	04/28/99
CHROMIUM VI	MB1 BS	S	99LVI036	N/A	04/28/99	04/28/99
CHROMIUM VI	MB1 BSD	S	99LVI036	N/A	04/28/99	04/28/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-001-154	Page 1 of 1
Collector Fahlberg/Kerkow		Company Contact R Coffman		Telephone No. 373-6425		Project Coordinator TRENT, SJ	
Project Designation 100 BC Areas - Quick Turn		Sampling Location 100 B/C		SAF No. B99-001		Price Code Data Turnaround	
Ice Chest No. ERC 96 010		Field Logbook No. EL 1327-2		Method of Shipment Federal Express			
Shipped To JMA/RECRA 4/20/99		Offsite Property No. A 990116		Bill of Lading/Air Bill No. 423579524905			
COA							

POSSIBLE SAMPLE HAZARDS/REMARKS 237	Preservation	None	Cool 4C	Cool 4C	Cool 4C	None
	Type of Container	I	G	aG	aG	aG
	No. of Container(s)	1	1	1	1	1
	Special Handling and/or Storage	Volume	20mL	60g	60mL	60mL

SAMPLE ANALYSIS				Active Scan	See Item (1) in Special Instructions	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See Item (2) in Special Instructions
				AS 4/20/99				AS 4/20/99
Sample No.	Matrix *	Sample Date	Sample Time					
B0V838	Soil	4/19/99	1415	X	X	X	X	X
B0V839	Soil	4/19/99	1503	X	X	X	X	X
B0V840	Soil							

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By R. Nelson	Received By Ref. 1B
Date/Time 4/19/99	Date/Time 4/19/99
Relinquished By S. J. O'Neil	Received By S. J. O'Neil
Date/Time 4/21/99 0730	Date/Time 4/21/99 0730
Relinquished By S. J. O'Neil	Received By FedEx
Date/Time 4/21/99 0800	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV); Chromium Hex - 7196

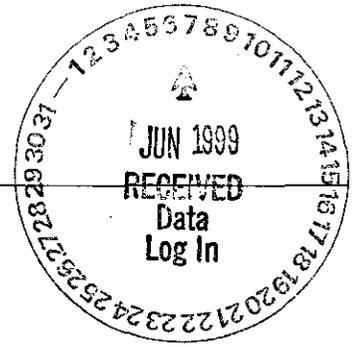
(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Cesium-134, Uranium-238); Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 - Total Sr; Nickel-63

NOTE: COLLECTOR UNAVAILABLE TO SIGN COC

Matrix *

Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By T. O'Neil	Title Logan Unit Leader	Date/Time 4/22/99 0830
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-001
RFW# : 9904L737
SDG/SAF# : H0388/B99-001

W.O.# : 10985-001-001-9999-00
Date Received: 04-22-99

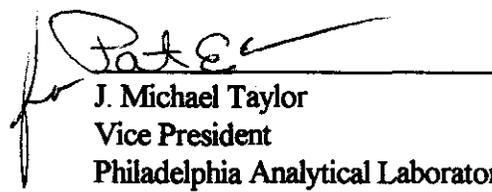
METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 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. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration levels, due to high concentrations of the following analytes:

<u>Sample ID</u>	<u>Element</u>	<u>PDS Concentration (ppb)</u>	<u>PDS % Recovery</u>
B0V838	Chromium	5000	92.9

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.

12. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory
mld/m04-737

5-12-99
Date



METALS METHOD GLOSSARY

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

Recra Lot#: 9904L737

Leaching Procedure: 1310 1311 1312 Other:

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

Metals Digestion Methods: 3005A 3010A 3015 3020A ~~5050A~~ 3051 200.7 SS17
 Other:

Metals Analysis Methods

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

Other:

Method:

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- * = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 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 05/03/99

CLIENT: TNU-HANFORD B99-001

RECRA LOT #: 9904L737

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BOV838	Chromium, Total	714	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	26.9	MG/KG	0.19	1.0
-002	BOV839	Chromium, Total	233	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.6	MG/KG	0.16	1.0

Recre LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/03/99

CLIENT: TNU-HANFORD B99-001
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9904L737

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0241-MB1	Chromium, Total	0.24	MG/KG	0.06	1.0
		Lead, Total	0.41	MG/KG	0.18	1.0
BLANK1	99C0119-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recre LabNet - Lionville

INORGANICS ACCURACY REPORT 05/03/99

CLIENT: TNU-HANFORD B99-001

RECRA LOT #: 9904L737

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	BOV838	Chromium, Total	712	714	20.9	-10. *	1.0
		Mercury, Total	0.20	0.02u	0.18	110.8	1.0
		Lead, Total	75.4	26.9	52.3	92.7	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 05/03/99

CLIENT: TNU-HANFORD B99-001

RECRA LOT #: 9904L737

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE RPD		
-001REP	BOV838	Chromium, Total	714	747	4.5	1.0
		Mercury, Total	0.02u	0.02	200	1.0
		Lead, Total	26.9	22.8	16.5	1.0

*Correction
M/G 5/3/99*

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 05/03/99

CLIENT: TNU-HANFORD B99-001

RECRA LOT #: 9904L737

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

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	99L0241-LC1	Chromium, LCS	47.7	50.0	MG/KG	95.4
		Lead, LCS	235	250	MG/KG	94.0
LCS1	99C0119-LC1	Mercury, LCS	0.96	1.0	MG/KG	95.7

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-001

DATE RECEIVED: 04/22/99

RFW LOT # :9904L737

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
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BOV838

CHROMIUM, TOTAL	001	S	99L0241	04/19/99	04/26/99	04/30/99
CHROMIUM, TOTAL	001 REP	S	99L0241	04/19/99	04/26/99	04/30/99
CHROMIUM, TOTAL	001 MS	S	99L0241	04/19/99	04/26/99	04/30/99
MERCURY, TOTAL	001	S	99C0119	04/19/99	04/30/99	05/03/99
MERCURY, TOTAL	001 REP	S	99C0119	04/19/99	04/30/99	05/03/99
MERCURY, TOTAL	001 MS	S	99C0119	04/19/99	04/30/99	05/03/99
LEAD, TOTAL	001	S	99L0241	04/19/99	04/26/99	04/30/99
LEAD, TOTAL	001 REP	S	99L0241	04/19/99	04/26/99	04/30/99
LEAD, TOTAL	001 MS	S	99L0241	04/19/99	04/26/99	04/30/99

BOV839

CHROMIUM, TOTAL	002	S	99L0241	04/19/99	04/26/99	04/30/99
MERCURY, TOTAL	002	S	99C0119	04/19/99	04/30/99	05/03/99
LEAD, TOTAL	002	S	99L0241	04/19/99	04/26/99	04/30/99

LAB QC:

CHROMIUM LABORATORY	LC1 BS	S	99L0241	N/A	04/26/99	04/30/99
CHROMIUM, TOTAL	MB1	S	99L0241	N/A	04/26/99	04/30/99
MERCURY LABORATORY	LC1 BS	S	99C0119	N/A	04/30/99	05/03/99
MERCURY, TOTAL	MB1	S	99C0119	N/A	04/30/99	05/03/99
LEAD LABORATORY	LC1 BS	S	99L0241	N/A	04/26/99	04/30/99
LEAD, TOTAL	MB1	S	99L0241	N/A	04/26/99	04/30/99

Collector Fahlberg/Kerkow	Company Contact R Coffman	Telephone No. 373-6425	Project Coordinator TRENT, SJ	Price Code	Data Turnaround
Project Designation 100 BC Areas - Quick Turn	Sampling Location 100 B/C	SAF No. B99-001			
Ice Chest No. ERC 96 010	Field Logbook No. EL 1327-2	Method of Shipment Federal Express			
Shipped To JMW/RECRA 427 4291	Offsite Property No. A 990116	Bill of Lading/Air Bill No. 423579524905			

COA

POSSIBLE SAMPLE HAZARDS/REMARKS 732	Preservation	None	Cool 4C	Cool 4C	Cool 4C	None
	Type of Container		G	aG	aG	aG
	No. of Container(s)	1	1	1	1	1
	Special Handling and/or Storage	Volume	20mL	60g	60mL	60mL

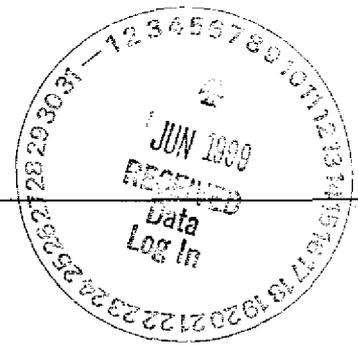
SAMPLE ANALYSIS				Activity Scan	See item (1) in Special Instructions	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions
Sample No.	Matrix *	Sample Date	Sample Time					
B0V838	Soil	4/19/99	1415	X	X	X	X	X
B0V839	Soil	4/19/99	1503	X	X	X	X	X
B0V840	Soil							

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By R. Nielson	Date/Time 4/19/99	(1) ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV); Chromium Hex - 7196 (2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Cesium-134, Uranium-238); Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 - Total Sr; Nickel-63 NOTE: COLLECTOR UNAVAILABLE TO SIGN COC	Soil Water Vapor Other Solid Other Liquid
Received By S. JONES	Date/Time 4/19/99 0730		
Relinquished By S. JONES	Date/Time 4/21/99 0800		
Received By FedEx	Date/Time		

LABORATORY SECTION	Received By FedEx	Title Logan Unit Leader	Date/Time 4/22/99 0830
DISPOSAL SECTION	Disposal Method	Disposed By	Date/Time

012

**Recra LabNet Philadelphia
Analytical Report**



Client : TNU-HANFORD B99-001
RFW# : 9904L737
SDG/SAF #: H0388/ B99-001

W.O. #: 10985-001-001-9999-00
Date Received: 04-22-99

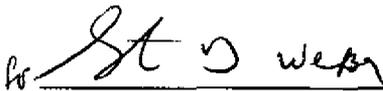
GC/MS VOLATILE

Two (2) soil samples were collected on 04-19-99.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 04-28-99.

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

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. The required holding time for analysis was met.
3. A non-target compound was detected in the method blank 99LVH128-MB1.
4. All surrogate recoveries were within EPA QC limits.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The method blank contained the common laboratory contaminants Methylene Chloride, Acetone and the target compound Chloromethane at levels less than the CRQL.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

som\group\data\voa\tnu04737.doc

06-03-99

Date

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 13 pages.

GLOSSARY OF VQA DATA

DATA QUALIFIERS

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



GLOSSARY OF VOA DATA

ABBREVIATIONS

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



Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 05/03/99 12:33

RFW Batch Number: 9904L737

Client: TNU-HANFORD B99-001

Work Order: 10985001001 Page: 1a

04

Sample Information	Cust ID:	BOV838	BOV839	BOV839	BOV839	BOV839	VELKAJ	VELKAJ BS
	RFW#:	001	002	002 MS	002 MSD	99LVH128-MB1	99LVH128-MB1	
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
	D.F.:	0.980	1.00	1.00	0.980	1.00	1.00	
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	
Surrogate	Toluene-d8	103 %	102 %	105 %	106 %	101 %	101 %	
Recovery	Bromofluorobenzene	102 %	102 %	106 %	105 %	102 %	102 %	
	1,2-Dichloroethane-d4	96 %	95 %	100 %	97 %	94 %	92 %	
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====								
Chloromethane		10 U	11 U	11 U	10 U	1 J	10 U	
Bromomethane		10 U	11 U	11 U	10 U	10 U	10 U	
Vinyl Chloride		10 U	11 U	11 U	10 U	10 U	10 U	
Chloroethane		10 U	11 U	11 U	10 U	10 U	10 U	
Methylene Chloride		12 B	3 BJ	13 B	12 B	2 J	5 B	
Acetone		11 B	5 BJ	6 BJ	8 BJ	4 J	4 JB	
Carbon Disulfide		5 U	6 U	6 U	5 U	5 U	5 U	
1,1-Dichloroethene		5 U	6 U	86 %	86 %	5 U	64 %	
1,1-Dichloroethane		5 U	6 U	6 U	5 U	5 U	5 U	
1,2-Dichloroethene (total)		5 U	6 U	6 U	5 U	5 U	5 U	
Chloroform		5 U	6 U	6 U	5 U	5 U	5 U	
1,2-Dichloroethane		5 U	6 U	6 U	5 U	5 U	5 U	
2-Butanone		10 U	11 U	11 U	10 U	10 U	10 U	
1,1,1-Trichloroethane		5 U	6 U	6 U	5 U	5 U	5 U	
Carbon Tetrachloride		5 U	6 U	6 U	5 U	5 U	5 U	
Bromodichloromethane		5 U	6 U	6 U	5 U	5 U	5 U	
1,2-Dichloropropane		5 U	6 U	6 U	5 U	5 U	5 U	
cis-1,3-Dichloropropene		5 U	6 U	6 U	5 U	5 U	5 U	
Trichloroethene		5 U	6 U	97 %	95 %	5 U	91 %	
Dibromochloromethane		5 U	6 U	6 U	5 U	5 U	5 U	
1,1,2-Trichloroethane		5 U	6 U	6 U	5 U	5 U	5 U	
Benzene		5 U	6 U	97 %	96 %	5 U	90 %	
Trans-1,3-Dichloropropene		5 U	6 U	6 U	5 U	5 U	5 U	
Bromoform		5 U	6 U	6 U	5 U	5 U	5 U	
4-Methyl-2-pentanone		10 U	11 U	11 U	10 U	10 U	10 U	
2-Hexanone		10 U	11 U	11 U	10 U	10 U	10 U	
Tetrachloroethene		5 U	6 U	6 U	5 U	5 U	5 U	
1,1,2,2-Tetrachloroethane		5 U	6 U	6 U	5 U	5 U	5 U	
Toluene		5 U	6 U	100 %	99 %	5 U	94 %	

*= Outside of EPA CLP QC limits.

Cust ID:	BOV838	BOV839	BOV839	BOV839	VELKAJ	VELKAJ BS
RFW#:	001	002	002 MS	002 MSD	99LVH128-MB1	99LVH128-MB1

Chlorobenzene	5 U	6 U	102 %	101 %	5 U	97 %
Ethylbenzene	5 U	6 U	6 U	5 U	5 U	5 U
Styrene	5 U	6 U	6 U	5 U	5 U	5 U
Xylene (total)	5 U	6 U	6 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

50

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0V838

Lab Name: Recra.LabNet Contract: 10985001001
Lab Code: Recra Case No.: _____ SAS No.: _____ SDG No.: _____
Matrix: (soil/water) SOIL Lab Sample ID: 9904L737-001
Sample wt/vol: 5.10 (g/mL) G Lab File ID: h042815
Level: (low/med) LOW Date Received: 04/22/99
% Moisture: not dec. 5 Date Analyzed: 04/28/99
Column: (pack/cap) CAP Dilution Factor: 0.980

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

BOV839

Lab Name: Recra.LabNet

Contract: 10985001001

Lab Code: Recra Case No.: _____

SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL

Lab Sample ID: 9904L737-002

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: h042809

Level: (low/med) LOW

Date Received: 04/22/99

% Moisture: not dec. 5

Date Analyzed: 04/28/99

Column: (pack/cap) CAP

Dilution Factor: 1.00

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-001-154	Page 1 of 1
Collector Fahlberg/Kerkow		Company Contact R Coffman		Telephone No. 373-6425		Project Coordinator TRENT, SJ	
Project Designation 100 BC Areas - Quick Turn		Sampling Location 100 BC		SAF No. B99-001		Price Code Data Turnaround	
Ice Chest No. ERC 96 010		Field Logbook No. EL 1327-2		Method of Shipment Federal Express			
Shipped To JMA/RECRA 427 42971		Offsite Property No. A 990116		Bill of Lading/Air Bill No. B 423579524905			
COA							

POSSIBLE SAMPLE HAZARDS/REMARKS 737	Preservation	None	Cool 4C	Cool 4C	Cool 4C	None					
	Type of Container	R	G	sG	sG	sG					
	No. of Container(s)	1	1	1	1						
	Volume	20mL	60g	60mL	60mL	500mL					
Special Handling and/or Storage											

SAMPLE ANALYSIS				Activity Scan	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.				
				AS 4/20/99				AS 4/20/99				
Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.				
BOV838	Soil	4/19/99	1415	X	X	X	X	X				
BOV839	Soil	4/19/99	1503	X	X	X	X	X				
BOV840	Soil											

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By <i>[Signature]</i>	Date/Time 4/19/99 1630	Received By REF. 1B	Date/Time 4/19/99
Relinquished By REF 1B 42498 0730	Date/Time 4/19/99 0730	Received By S JONES L. B. L.	Date/Time 4/19/99 0730
Relinquished By S JONES L. B. L.	Date/Time 4/21/99 0800	Received By FedEx	Date/Time 4/21/99
Relinquished By 1	Date/Time	Received By	Date/Time
		NOTE: COLLECTOR UNAVAILABLE TO SIGN COC	

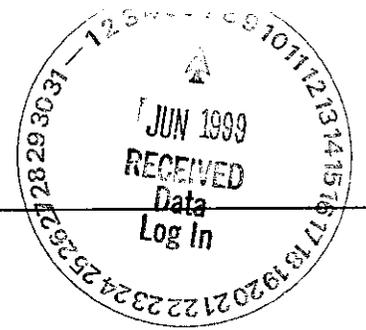
LABORATORY SECTION	Received By <i>[Signature]</i>	Title Logan Unit Leader	Date/Time 4/22/99 0830
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time



a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

**Recra LabNet Philadelphia
Analytical Report**



Client : TNU-HANFORD B99-001
RFW# : 9904L737
SDG/SAF #: H0388/ B99-001

W.O. #: 10985-001-001-9999-00
Date Received: 04-22-99

SEMIVOLATILE

Two (2) soil samples were collected on 04-19-99.

The samples and their associated QC samples were extracted on 04-23-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compounds on 04-26-99.

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

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis were met.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within EPA QC limits.
5. Four (4) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.

J. Michael Taylor

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

06-03-99
Date

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

GLOSSARY OF BNA DATA

DATA QUALIFIERS

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



GLOSSARY OF BNA DATA

ABBREVIATIONS

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



Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

Report Date: 05/06/99 15:57

RFW Batch Number: 9904L737

Client: TNU-HANFORD B99-001

Work Order: 10985001001

Page: 1a

04

Sample Information	Cust ID:	BOV838	BOV838	BOV838	BOV839	SBLKUO	SBLKUO BS
RFW#:	001	001 MS	001 MSD	002	99LE0488-MB1	99LE0488-MB1	
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
D.F.:	1.00	1.00	1.00	1.00	1.00	1.00	
Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	
Nitrobenzene-d5	87 %	92 %	91 %	90 %	72 %	86 %	
Surrogate 2-Fluorobiphenyl	89 %	97 %	95 %	87 %	81 %	94 %	
Recovery Terphenyl-d14	93 %	99 %	100 %	95 %	93 %	93 %	
Phenol-d5	91 %	97 %	99 %	93 %	79 %	91 %	
2-Fluorophenol	97 %	104 %	103 %	101 %	85 %	101 %	
2,4,6-Tribromophenol	85 %	101 %	97 %	90 %	78 %	89 %	
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====							
Phenol	350 U	93 * %	97 * %	350 U	330 U	88 %	
bis(2-Chloroethyl) ether	350 U	350 U	350 U	350 U	330 U	330 U	
2-Chlorophenol	350 U	92 %	94 %	350 U	330 U	88 %	
1,3-Dichlorobenzene	350 U	350 U	350 U	350 U	330 U	330 U	
1,4-Dichlorobenzene	350 U	82 %	81 %	350 U	330 U	80 %	
1,2-Dichlorobenzene	350 U	350 U	350 U	350 U	330 U	330 U	
2-Methylphenol	350 U	350 U	350 U	350 U	330 U	330 U	
2,2'-oxybis(1-Chloropropane)	350 U	350 U	350 U	350 U	330 U	330 U	
4-Methylphenol	350 U	350 U	350 U	350 U	330 U	330 U	
N-Nitroso-di-n-propylamine	350 U	88 %	90 %	350 U	330 U	79 %	
Hexachloroethane	350 U	350 U	350 U	350 U	330 U	330 U	
Nitrobenzene	350 U	350 U	350 U	350 U	330 U	330 U	
Isophorone	350 U	350 U	350 U	350 U	330 U	330 U	
2-Nitrophenol	350 U	350 U	350 U	350 U	330 U	330 U	
2,4-Dimethylphenol	350 U	350 U	350 U	350 U	330 U	330 U	
bis(2-Chloroethoxy) methane	350 U	350 U	350 U	350 U	330 U	330 U	
2,4-Dichlorophenol	350 U	350 U	350 U	350 U	330 U	330 U	
1,2,4-Trichlorobenzene	350 U	87 %	86 %	350 U	330 U	83 %	
Naphthalene	350 U	350 U	350 U	350 U	330 U	330 U	
4-Chloroaniline	350 U	350 U	350 U	350 U	330 U	330 U	
Hexachlorobutadiene	350 U	350 U	350 U	350 U	330 U	330 U	
4-Chloro-3-methylphenol	350 U	89 %	88 %	350 U	330 U	74 %	
2-Methylnaphthalene	350 U	350 U	350 U	350 U	330 U	330 U	
Hexachlorocyclopentadiene	350 U	350 U	350 U	350 U	330 U	330 U	
2,4,6-Trichlorophenol	350 U	350 U	350 U	350 U	330 U	330 U	
2,4,5-Trichlorophenol	880 U	880 U	880 U	880 U	840 U	840 U	

*= Outside of EPA CLP QC limits.

RFW#:	001	001 MS	001 MSD	002	99LE0488-MB1	99LE0488-MB1
2-Chloronaphthalene	350 U	350 U	350 U	350 U	330 U	330 U
2-Nitroaniline	880 U	880 U	880 U	880 U	840 U	840 U
Dimethylphthalate	350 U	350 U	350 U	350 U	330 U	330 U
Acenaphthylene	350 U	350 U	350 U	350 U	330 U	330 U
2,6-Dinitrotoluene	350 U	350 U	350 U	350 U	330 U	330 U
3-Nitroaniline	880 U	880 U	880 U	880 U	840 U	840 U
Acenaphthene	350 U	88 %	87 %	350 U	330 U	85 %
2,4-Dinitrophenol	880 U	880 U	880 U	880 U	840 U	840 U
4-Nitrophenol	880 U	66 %	61 %	880 U	840 U	52 %
Dibenzofuran	350 U	350 U	350 U	350 U	330 U	330 U
2,4-Dinitrotoluene	350 U	83 %	83 %	350 U	330 U	73 %
Diethylphthalate	350 U	350 U	350 U	350 U	330 U	330 U
4-Chlorophenyl-phenylether	350 U	350 U	350 U	350 U	330 U	330 U
Fluorene	350 U	350 U	350 U	350 U	330 U	330 U
4-Nitroaniline	880 U	880 U	880 U	880 U	840 U	840 U
4,6-Dinitro-2-methylphenol	880 U	880 U	880 U	880 U	840 U	840 U
N-Nitrosodiphenylamine (1)	350 U	350 U	350 U	350 U	330 U	330 U
4-Bromophenyl-phenylether	350 U	350 U	350 U	350 U	330 U	330 U
Hexachlorobenzene	350 U	350 U	350 U	350 U	330 U	330 U
Pentachlorophenol	880 U	112 * %	110 * %	880 U	840 U	102 %
Phenanthrene	350 U	350 U	350 U	350 U	330 U	330 U
Anthracene	350 U	350 U	350 U	350 U	330 U	330 U
Carbazole	350 U	350 U	350 U	350 U	330 U	330 U
Di-n-butylphthalate	350 U	350 U	350 U	350 U	330 U	330 U
Fluoranthene	350 U	350 U	350 U	350 U	330 U	330 U
Pyrene	350 U	90 %	94 %	350 U	330 U	84 %
Butylbenzylphthalate	350 U	350 U	350 U	350 U	330 U	330 U
3,3'-Dichlorobenzidine	350 U	350 U	350 U	350 U	330 U	330 U
Benzo (a) anthracene	350 U	350 U	350 U	350 U	330 U	330 U
Chrysene	350 U	350 U	350 U	350 U	330 U	330 U
bis (2-Ethylhexyl) phthalate	350 U	350 U	350 U	350 U	330 U	330 U
Di-n-octyl phthalate	350 U	350 U	350 U	350 U	330 U	330 U
Benzo (b) fluoranthene	350 U	350 U	350 U	350 U	330 U	330 U
Benzo (k) fluoranthene	350 U	350 U	350 U	350 U	330 U	330 U
Benzo (a) pyrene	350 U	350 U	350 U	350 U	330 U	330 U
Indeno (1,2,3-cd) pyrene	350 U	350 U	350 U	350 U	330 U	330 U
Dibenz (a,h) anthracene	350 U	350 U	350 U	350 U	330 U	330 U
Benzo (g,h,i) perylene	350 U	350 U	350 U	350 U	330 U	330 U

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

1F
 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B0V838

Lab Name: Recra.LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-001

Matrix: (soil/water) SOIL

Lab Sample ID: 9904L737-001

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

Lab File ID: D042606

Level: (low/med) LOW

Date Received: 04/22/99

% Moisture: 5 decanted: (Y/N)

Date Extracted: 04/23/99

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 04/26/99

Injection Volume: 2.0 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH:

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

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	23.18	300	J

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

BOV839

Lab Name: Recra, LabNet Work Order: 10985001001

Client: TNU-HANFORD B99-001

Matrix: (soil/water) SOIL Lab Sample ID: 9904L737-002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: D042609

Level: (low/med) LOW Date Received: 04/22/99

% Moisture: 5 decanted: (Y/N) Date Extracted: 04/23/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 04/26/99

Injection Volume: 2.0 (uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

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

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	23.18	300	J

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-001

DATE RECEIVED: 04/22/99

RFW LOT # :9904L737

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOV838	001	S	99LE0488	04/19/99	04/23/99	04/26/99
BOV838	001 MS	S	99LE0488	04/19/99	04/23/99	04/26/99
BOV838	001 MSD	S	99LE0488	04/19/99	04/23/99	04/26/99
BOV839	002	S	99LE0488	04/19/99	04/23/99	04/26/99

LAB QC:

SBLKUO	MB1	S	99LE0488	N/A	04/23/99	04/26/99
SBLKUO	MB1 BS	S	99LE0488	N/A	04/23/99	04/26/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-001-154	Page 1 of 11
Collector Fahlberg/Kerkow		Company Contact R Coffman		Telephone No. 373-6425	Project Coordinator TRENT, SJ	Price Code	Data Turnaround
Project Designation 100 BC Areas - Quick Turn		Sampling Location 100 B/C		SAF No. B99-001			
Ice Chest No. ERC 96 010		Field Logbook No. EL 1327-2		Method of Shipment Federal Express			
Shipped To JMA/RECRA 822 4299		Offsite Property No. A 990116		Bill of Lading/Air Bill No. 423579524905			
COA							

POSSIBLE SAMPLE HAZARDS/REMARKS 232	Preservation	None	Cool 4C	Cool 4C	Cool 4C	None					
	Type of Container	P	G	αG	αG	αG					
	No. of Container(s)	1	1	1	1						
	Special Handling and/or Storage	Volume	20mL	60g	60mL	60mL	500mL				

SAMPLE ANALYSIS				Activity Scan	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.				
				AP 4/22/99				AP 4/22/99				
Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	See item (2) in Special Instructions.				
B0V838	Soil	4/19/99	1415	X	X	X	X	X				
B0V839	Soil	4/19/99	1503	X	X	X	X	X				
B0V840	Soil											

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By Doreen Nelson	Date/Time 4/19/99	Received By REF. 1B	Date/Time 4/22/99	(1) ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV); Chromium Hex - 7196 (2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Cesium-134, Uranium-238); Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 - Total Sr; Nickel-63 NOTE: COLLECTOR UNAVAILABLE TO SIGN COC				Soil Water Vapor Other Solid Other Liquid	
Relinquished By REF 1B	Date/Time 4/21/99 0730	Received By SJOALC	Date/Time 4/21/99 0730						
Relinquished By SJOALC	Date/Time 4/21/99 0800	Received By FED EX	Date/Time						
Relinquished By	Date/Time	Received By	Date/Time						
LABORATORY SECTION	Received By Fodier	Title Logan Unit Leader	Date/Time 4/22/99 0930						
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time						

Thermo Nutech
W.O. No. N9-04-121-7716

Bechtel Hanford Inc.
SDG H0388

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0388 is comprised of three solid (soil) samples designated under SAF No. B99-001 with a Project Designation of: 100 BCAreas - Quick Turn.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist. Gamma Scan results were reported by fax on April 26, 1999; Isotopic Plutonium results by fax on April 28, 1999; Total Strontium data by fax on April 30, 1999; Americium and Nickel-63 by fax on May 6, 1999 and Isotopic Uranium by fax on April 28 and 30, 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 Uranium Analyses

No problems were encountered during the processing of the samples.

2.4 Isotopic Plutonium Analyses

The blank show low levels of Plutonium in ratios that were consistent with the LCS. We believe the blank to be contaminated with a trace amount of the LCS.

2.5 Gamma Scan Analyses

No problems were encountered during the processing of the samples.

2.6 Americium-241 Analyses

No problems were encountered during the processing of the samples.

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0388

SAMPLE SUMMARY

SDG 7716
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0388

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0V838	100 B/C	SOLID		N904121-01	B99-001	B99-001-154	04/19/99 14:15
B0V839	100 B/C	SOLID		N904121-02	B99-001	B99-001-154	04/19/99 15:03
Method Blank		SOLID		N904121-04	B99-001		
Lab Control Sample		SOLID		N904121-03	B99-001		
Duplicate (N904121-01)	100 B/C	SOLID		N904121-05	B99-001		04/19/99 14:15

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CS
 Version 3.06
 Report date 05/10/99

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0388

SDG 7716
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0388

QC SUMMARY

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
7716	B99-001-154	B0V838	SOLID	94.5			04/22/99 3	N904121-01	7716-001
		B0V839	SOLID	94.2			04/22/99 3	N904121-02	7716-002
		Method Blank	SOLID					N904121-04	7716-004
		Lab Control Sample	SOLID					N904121-03	7716-003
		Duplicate (N904121-01)	SOLID	94.5			04/22/99 3	N904121-05	7716-005

QC SUMMARY

Page 1

SUMMARY DATA SECTION

Page 4

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
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 Version 3.06
 Report date 05/10/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0388

SDG 7716
Contact L.A. Johnson

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0388

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI- FIERS
			BATCH	2σ %	CLIENT	MORE	RE BLANK	LCS	
Alpha Spectroscopy									
AM	SOLID	Americium 241 in Soil	2851-066	5.0	2		1	1	1/1
PU	SOLID	Plutonium, Isotopic in Solids	2851-066	5.0	2		1	1	1/1
U	SOLID	Uranium, Isotopic in Soil	2851-066	5.0	2		1	1	1/1
Beta Counting									
SR	SOLID	Total Strontium in Soil	2851-066	10.0	2		1	1	1/1
Gamma Spectroscopy									
GAM	SOLID	Gamma Scan	2851-066	15.0	2		1	1	1/1
Liquid Scintillation Counting									
NI_L	SOLID	Nickel 63 in Soil	2851-066	10.0	2		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 05/10/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0388

SDG 7716
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0388

WORK SUMMARY

CLIENT SAMPLE ID	LAB SAMPLE ID				SUF-					
LOCATION	MATRIX	COLLECTED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
CUSTODY	SAF No	RECEIVED								
B0V838		N904121-01	7716-001	AM		05/05/99	05/06/99	TAH	Americium 241 in Soil	
100 B/C	SOLID	04/19/99	7716-001	GAM		04/23/99	04/26/99	TAH	Gamma Scan	
B99-001-154	B99-001	04/22/99	7716-001	NI_L		05/01/99	05/06/99	TAH	Nickel 63 in Soil	
			7716-001	PU		04/27/99	04/28/99	TAH	Plutonium, Isotopic in Solids	
			7716-001	SR		04/27/99	04/29/99	TAH	Total Strontium in Soil	
			7716-001	U		04/28/99	04/28/99	TAH	Uranium, Isotopic in Soil	
B0V839		N904121-02	7716-002	AM		05/05/99	05/06/99	TAH	Americium 241 in Soil	
100 B/C	SOLID	04/19/99	7716-002	GAM		04/23/99	04/26/99	TAH	Gamma Scan	
B99-001-154	B99-001	04/22/99	7716-002	NI_L		05/01/99	05/06/99	TAH	Nickel 63 in Soil	
			7716-002	PU		04/27/99	04/28/99	TAH	Plutonium, Isotopic in Solids	
			7716-002	SR		04/27/99	04/29/99	TAH	Total Strontium in Soil	
			7716-002	U		04/28/99	04/28/99	TAH	Uranium, Isotopic in Soil	
Method Blank		N904121-04	7716-004	AM		05/05/99	05/06/99	TAH	Americium 241 in Soil	
	SOLID		7716-004	GAM		04/24/99	04/26/99	TAH	Gamma Scan	
	B99-001		7716-004	NI_L		05/01/99	05/06/99	TAH	Nickel 63 in Soil	
			7716-004	PU		04/28/99	04/28/99	TAH	Plutonium, Isotopic in Solids	
			7716-004	SR		04/27/99	04/29/99	TAH	Total Strontium in Soil	
			7716-004	U		04/28/99	04/28/99	TAH	Uranium, Isotopic in Soil	
Lab Control Sample		N904121-03	7716-003	AM		05/05/99	05/06/99	TAH	Americium 241 in Soil	
	SOLID		7716-003	GAM		04/23/99	04/26/99	TAH	Gamma Scan	
	B99-001		7716-003	NI_L		05/01/99	05/06/99	TAH	Nickel 63 in Soil	
			7716-003	PU		04/27/99	04/28/99	TAH	Plutonium, Isotopic in Solids	
			7716-003	SR		04/27/99	04/29/99	TAH	Total Strontium in Soil	
			7716-003	U		04/29/99	04/29/99	TAH	Uranium, Isotopic in Soil	
Duplicate (N904121-01)		N904121-05	7716-005	AM		05/05/99	05/06/99	TAH	Americium 241 in Soil	
100 B/C	SOLID	04/19/99	7716-005	GAM		04/24/99	04/26/99	TAH	Gamma Scan	
	B99-001	04/22/99	7716-005	NI_L		05/01/99	05/06/99	TAH	Nickel 63 in Soil	
			7716-005	PU		04/27/99	04/28/99	TAH	Plutonium, Isotopic in Solids	
			7716-005	SR		04/27/99	04/29/99	TAH	Total Strontium in Soil	
			7716-005	U		04/28/99	04/28/99	TAH	Uranium, Isotopic in Soil	

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CWS
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 Report date 05/10/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0388

WORK SUMMARY, cont.

SDG 7716
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0388

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AM	B99-001	Americium 241 in Soil	AM/CMPLETE	2			1	1	1		5
GAM	B99-001	Gamma Scan	GAMMAHI	2			1	1	1		5
NI_L	B99-001	Nickel 63 in Soil	NI63LSC	2			1	1	1		5
PU	B99-001	Plutonium, Isotopic in Solids	PUPLATE	2			1	1	1		5
SR	B99-001	Total Strontium in Soil		2			1	1	1		5
U	B99-001	Uranium, Isotopic in Soil	UPLATE	2			1	1	1		5
TOTALS				12			6	6	6		30

WORK SUMMARY

Page 2

SUMMARY DATA SECTION

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Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CWS
 Version 3.06
 Report date 05/10/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0388

N904121-04

Method Blank

METHOD BLANK

SDG <u>7716</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0388</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904121-04</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7716-004</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-001</u>	

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	0.024	0.092	0.30	U	U
Uranium 235	15117-96-1	0.014	0.029	0.11	0.30	U	U
Uranium 238	U-238	0	0.024	0.092	0.30	U	U
Plutonium 238	13981-16-3	<u>0.183</u>	0.074	<u>0.056</u>	0.050		PU
Plutonium 239/240	PU-239/240	<u>0.190</u>	0.074	<u>0.056</u>	0.050		PU
Nickel 63	13981-37-8	0.179	1.2	2.1	20	U	NI_L
Americium 241	14596-10-2	0.003	0.010	0.019	0.050	U	AM
Total Strontium	SR-RAD	-0.008	0.18	0.32	1.0	U	SR
Cobalt 60	10198-40-0	U		0.009	0.050	U	GAM
Cesium 134	13967-70-9	U		0.011		U	GAM
Cesium 137	10045-97-3	U		0.010	0.050	U	GAM
Europium 152	14683-23-9	U		0.024	0.10	U	GAM
Europium 154	15585-10-1	U		0.029	0.10	U	GAM
Europium 155	14391-16-3	U		0.022	0.10	U	GAM
Americium 241	14596-10-2	U		0.018		U	GAM
Uranium 238	U-238	U		1.2		U	GAM
Uranium 235	15117-96-1	U		0.028		U	GAM

100 BC Areas-Quick Turn

QC-BLANK 30582

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 05/10/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0388

N904121-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7716</u>	Client/Case no <u>Hanford</u> SDG-H0388
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>
Lab sample id <u>N904121-03</u>	Client sample id <u>Lab Control Sample</u>
Dept sample id <u>7716-003</u>	Material/Matrix <u>SOLID</u>
	SAF No <u>B99-001</u>

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ	LMTS	PROTOCOL
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST	pCi/g	pCi/g	%	(TOTAL)	LIMITS	
Uranium 233/234	5.30	0.72	<u>0.33</u>	0.30	U	4.75	0.19	112	75-125	80-120	
Uranium 235	4.10	0.62	0.10	0.30	U	3.89	0.16	105	74-126	80-120	
Uranium 238	5.60	0.75	<u>0.32</u>	0.30	U	4.90	0.20	114	75-125	80-120	
Plutonium 238	4.95	0.49	<u>0.061</u>	0.050	B PU	5.03	0.20	98	83-117	80-120	
Plutonium 239/240	4.98	0.49	<u>0.061</u>	0.050	B PU	5.29	0.21	94	83-117	80-120	
Nickel 63	142	3.8	2.0	20	NI_L	134	5.4	106	82-118		
Americium 241	5.04	0.31	0.016	0.050	AM	5.27	0.21	96	87-113	80-120	
Total Strontium	12.0	0.58	0.25	1.0	SR	11.4	0.46	105	81-119		
Cobalt 60	0.300	0.030	0.014	0.050	GAM	0.304	0.012	99	73-127	80-120	
Cesium 137	0.390	0.029	0.018	0.050	GAM	0.347	0.014	112	71-129	80-120	

100 BC Areas-Quick Turn

QC-LCS 30581

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 05/10/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0388

N904121-05

BOV838

DUPLICATE

SDG <u>7716</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0388</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N904121-05</u>	Lab sample id <u>N904121-01</u>	Client sample id <u>BOV838</u>
Dept sample id <u>7716-005</u>	Dept sample id <u>7716-001</u>	Location/Matrix <u>100 B/C</u> <u>SOLID</u>
	Received <u>04/22/99</u>	Collected <u>04/19/99 14:15</u>
% solids <u>94.5</u>	% solids <u>94.5</u>	Custody/SAF No <u>B99-001-154</u> <u>B99-001</u>

ANALYTE	DUPLICATE	2σ ERR	MDA	RDL	QUALI-	ORIGINAL	2σ ERR	MDA	QUALI-	RPD	3σ	PROT
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS		TEST	pCi/g	(COUNT)	pCi/g	FIERS	%
Uranium 233/234	0.403	0.17	0.16	0.30		U	0.434	0.19	0.14		7	92
Uranium 235	0.026	0.051	0.20	0.30	U	U	0.069	0.092	0.17	U	-	
Uranium 238	0.403	0.17	0.16	0.30		U	0.491	0.19	0.14		20	86
Plutonium 238	0.069	0.28	<u>0.53</u>	0.050	U	PU	0.067	0.13	<u>0.51</u>	U	-	
Plutonium 239/240	0.482	0.41	<u>0.53</u>	0.050	U	PU	1.07	0.54	<u>0.51</u>	B	76	132
Nickel 63	705	8.7	2.4	20		NI_L	712	8.6	2.3		1	21
Americium 241	1.94	0.18	0.041	0.050		AM	1.96	0.19	0.032		1	23
Total Strontium	11.9	2.0	<u>2.1</u>	1.0		SR	11.0	2.5	<u>3.1</u>		8	47
Potassium 40	14.0	2.6	1.8			GAM	18.5	3.3	2.8		28	50
Cobalt 60	20.0	0.71	<u>0.33</u>	0.050		GAM	20.6	0.82	<u>0.41</u>		3	33
Cesium 134	U		0.78		U	GAM	U		0.87	U	-	
Cesium 137	67.0	1.2	<u>0.87</u>	0.050		GAM	65.5	1.3	<u>0.94</u>		2	32
Europium 152	130	2.5	<u>2.2</u>	0.10		GAM	122	2.6	<u>2.2</u>		6	32
Europium 154	12.0	1.4	<u>1.4</u>	0.10		GAM	12.4	1.8	<u>1.5</u>		3	42
Europium 155	U		<u>1.6</u>	0.10	U	GAM	U		<u>1.5</u>	U	-	
Americium 241	U		2.0		U	GAM	1.53	0.50	0.73		27	178
Uranium 238	U		85		U	GAM	U		110	U	-	
Uranium 235	U		2.2		U	GAM	U		1.9	U	-	

100 BC Areas-Quick Turn

QC-DUP#1 30583

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>05/10/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0388

N904121-01

B0V838

DATA SHEET

SDG <u>7716</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0388</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904121-01</u>	Client sample id <u>B0V838</u>	
Dept sample id <u>7716-001</u>	Location/Matrix <u>100 B/C</u>	<u>SOLID</u>
Received <u>04/22/99</u>	Collected <u>04/19/99 14:15</u>	
% solids <u>94.5</u>	Custody/SAF No <u>B99-001-154</u>	<u>B99-001</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.434	0.19	0.14	0.30		U
Uranium 235	15117-96-1	0.069	0.092	0.17	0.30	U	U
Uranium 238	U-238	0.491	0.19	0.14	0.30		U
Plutonium 238	13981-16-3	0.067	0.13	<u>0.51</u>	0.050	U	PU
Plutonium 239/240	PU-239/240	1.07	0.54	<u>0.51</u>	0.050	B	PU
Nickel 63	13981-37-8	712	8.6	2.3	20		NI_L
Americium 241	14596-10-2	1.96	0.19	0.032	0.050		AM
Total Strontium	SR-RAD	11.0	2.5	<u>3.1</u>	1.0		SR
Potassium 40	13966-00-2	18.5	3.3	2.8			GAM
Cobalt 60	10198-40-0	20.6	0.82	<u>0.41</u>	0.050		GAM
Cesium 134	13967-70-9	U		0.87		U	GAM
Cesium 137	10045-97-3	65.5	1.3	<u>0.94</u>	0.050		GAM
Europium 152	14683-23-9	122	2.6	<u>2.2</u>	0.10		GAM
Europium 154	15585-10-1	12.4	1.8	<u>1.5</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>1.5</u>	0.10	U	GAM
Americium 241	14596-10-2	1.53	0.50	0.73			GAM
Uranium 238	U-238	U		110		U	GAM
Uranium 235	15117-96-1	U		1.9		U	GAM

100 BC Areas-Quick Turn

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/10/99</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0388

N904121-02

BOV839

DATA SHEET

SDG <u>7716</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0388</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904121-02</u>	Client sample id <u>BOV839</u>	
Dept sample id <u>7716-002</u>	Location/Matrix <u>100 B/C</u>	<u>SOLID</u>
Received <u>04/22/99</u>	Collected <u>04/19/99 15:03</u>	
% solids <u>94.2</u>	Custody/SAF No <u>B99-001-154</u>	<u>B99-001</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.381	0.18	0.13	0.30		U
Uranium 235	15117-96-1	0.042	0.042	0.16	0.30	U	U
Uranium 238	U-238	0.329	0.14	0.13	0.30		U
Plutonium 238	13981-16-3	0.070	0.28	<u>0.53</u>	0.050	U	PU
Plutonium 239/240	PU-239/240	2.65	0.85	<u>0.53</u>	0.050	B	PU
Nickel 63	13981-37-8	999	10	2.3	20		NI_L
Americium 241	14596-10-2	1.78	0.18	0.034	0.050		AM
Total Strontium	SR-RAD	162	6.8	<u>2.5</u>	1.0		SR
Potassium 40	13966-00-2	22.9	3.5	2.8			GAM
Cobalt 58	13981-38-9	0.655	0.64	<u>0.88</u>	0.050	U	GAM
Cobalt 60	10198-40-0	54.2	1.3	<u>0.63</u>	0.050		GAM
Cesium 134	13967-70-9	U		0.99		U	GAM
Cesium 137	10045-97-3	8.14	0.93	<u>1.1</u>	0.050		GAM
Europium 152	14683-23-9	181	2.8	<u>2.3</u>	0.10		GAM
Europium 154	15585-10-1	19.5	2.0	<u>1.9</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>1.9</u>	0.10	U	GAM
Americium 241	14596-10-2	2.94	1.7	2.4			GAM
Uranium 238	U-238	U		120		U	GAM
Uranium 235	15117-96-1	U		2.5		U	GAM

100 BC Areas-Quick Turn

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/10/99</u>

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0388

Test AM Matrix SOLID
 SDG 7716
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0388

METHOD SUMMARY
 AMERICIUM 241 IN SOIL
 ALPHA SPECTROSCOPY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Americium 241
Preparation batch 2851-066					
B0V838	N904121-01	7716-001			1.96
B0V839	N904121-02	7716-002			1.78
BLK (QC ID=30582)	N904121-04	7716-004			U
LCS (QC ID=30581)	N904121-03	7716-003			ok
Duplicate (N904121-01)	N904121-05	7716-005			ok
Nominal values and limits from method		RDLs (pCi/g)		0.050	
100 BC Areas-Quick Turn					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EPF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 2851-066		2σ prep error 5.0 %		Reference Lab		Notebook #2851 pg. 066										
B0V838	N904121-01			0.032	<u>0.500</u>			76		925			16	05/05/99	05/05	SS-013
B0V839	N904121-02			0.034	<u>0.500</u>			84		925			16	05/05/99	05/05	SS-016
BLK (QC ID=30582)	N904121-04			0.019	1.00			77		922				05/05/99	05/05	SS-036
LCS (QC ID=30581)	N904121-03			0.016	1.00			89		922				05/05/99	05/05	SS-035
Duplicate (N904121-01)	N904121-05			0.041	<u>0.500</u>			94		922			16	05/05/99	05/05	SS-038
(QC ID=30583)																
Nominal values and limits from method				0.050	1.00			20-105		700	100		180			

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 <u>0.028</u> ± <u>0.021</u>
FOR 5 SAMPLES	YIELD <u>84</u> ± <u>15</u>

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
 Version 3.06
 Report date 05/10/99

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0388

Test PU Matrix SOLID
 SDG 7716
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0388

METHOD SUMMARY
 PLUTONIUM, ISOTOPIC IN SOLIDS
 ALPHA SPECTROSCOPY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 2851-066				
B0V838	N904121-01	7716-001	0.067 U	1.07
B0V839	N904121-02	7716-002	0.070 U	2.65
BLK (QC ID=30582)	N904121-04	7716-004	<u>0.183</u>	<u>0.190</u>
LCS (QC ID=30581)	N904121-03	7716-003	ok	ok
Duplicate (N904121-01)	N904121-05	7716-005	- U	ok U
Nominal values and limits from method		RDLs (pCi/g)	0.050	0.050
100 BC Areas-Quick Turn				

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 2851-066		2σ prep error 5.0 %		Reference Lab		Notebook #2851 pg. 066									
B0V838	N904121-01		<u>0.51</u>	<u>0.100</u>			87	200				8	04/27/99	04/27	SS-055
B0V839	N904121-02		<u>0.53</u>	<u>0.100</u>			83	200				8	04/27/99	04/27	SS-057
BLK (QC ID=30582)	N904121-04		<u>0.056</u>	1.00			72	217					04/27/99	04/28	SS-045
LCS (QC ID=30581)	N904121-03		<u>0.061</u>	1.00			71	200					04/27/99	04/27	SS-061
Duplicate (N904121-01)	N904121-05		<u>0.53</u>	<u>0.100</u>			84	200				8	04/27/99	04/27	SS-066
		(QC ID=30583)													
Nominal values and limits from method			0.050	1.00			20-105	10	100		180				

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

AVERAGES ± 2 SD	MDA <u>0.34</u> ± <u>0.51</u>
FOR 5 SAMPLES	YIELD <u>79</u> ± <u>15</u>

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CMS
 Version 3.06
 Report date 05/10/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0388

Test U Matrix SOLID
SDG 7716
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0388

METHOD SUMMARY
URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	PLANCHET	1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)			
				233/234	235	238	1+3	2σ	2+3	2σ
Preparation batch 2851-066										
BOV838	N904121-01		7716-001	0.434	U	0.491	88	52	14	20
BOV839	N904121-02		7716-002	0.381	U	0.329	116	74	13	14
BLK (QC ID=30582)	N904121-04		7716-004	U	U	U				
LCS (QC ID=30581)	N904121-03		7716-003	ok	ok	ok				
Duplicate (N904121-01)	N904121-05		7716-005	ok	- U	ok	100	60	6	13
Nominal values and limits from method			RDLs (pCi/g)	0.30	0.30	0.30	100			4
100 BC Areas-Quick Turn							Averages 101			11

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED		DETECTOR	
													YZED			
Preparation batch 2851-066													2σ prep error 5.0 %		Reference Lab Notebook #2851 pg. 066	
BOV838	N904121-01		0.17	<u>0.500</u>			90	<u>139</u>				9	04/28/99	04/28	SS-035	
BOV839	N904121-02		0.16	<u>0.500</u>			98	<u>139</u>				9	04/28/99	04/28	SS-036	
BLK (QC ID=30582)	N904121-04		0.11	1.00			72	<u>139</u>					04/28/99	04/28	SS-038	
LCS (QC ID=30581)	N904121-03		<u>0.33</u>	1.00			67	156					04/28/99	04/29	SS-055	
Duplicate (N904121-01)	N904121-05		0.20	<u>0.500</u>			80	<u>139</u>				9	04/28/99	04/28	SS-039	
(QC ID=30583)																
Nominal values and limits from method			0.30	1.00			30-105	150	100		180					

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 <u>0.19</u> ± <u>0.17</u>
FOR 5 SAMPLES	YIELD <u>81</u> ± <u>25</u>

METHOD SUMMARIES

Page 3

SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 05/10/99

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0388

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
 BETA COUNTING

Test SR Matrix SOLID

SDG 7716

Contact L.A. Johnson

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0388

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Total Strontium
Preparation batch 2851-066					
BOV838	N904121-01			7716-001	11.0
BOV839	N904121-02			7716-002	162
BLK (QC ID=30582)	N904121-04			7716-004	U
LCS (QC ID=30581)	N904121-03			7716-003	ok
Duplicate (N904121-01)	N904121-05			7716-005	ok

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

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 2851-066 2σ prep error 10.0 % Reference Lab Notebook #2851 pg. 066																
BOV838	N904121-01			3.1	0.100			60		150			8	04/27/99	04/27	GRB-220
BOV839	N904121-02			2.5	0.100			75		150			8	04/27/99	04/27	GRB-217
BLK (QC ID=30582)	N904121-04			0.32	1.00			77		150				04/27/99	04/27	GRB-204
LCS (QC ID=30581)	N904121-03			0.25	1.00			78		150				04/27/99	04/27	GRB-218
Duplicate (N904121-01)	N904121-05			2.1	0.100			74		400			8	04/27/99	04/27	GRB-229
	(QC ID=30583)															

Nominal values and limits from method 1.0 1.00 100 180

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

AVERAGES ± 2 SD MDA 1.7 ± 2.6
 FOR 5 SAMPLES YIELD 73 ± 15

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-CMS

Version 3.06

Report date 05/10/99

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0388

METHOD SUMMARY

GAMMA SCAN
 GAMMA SPECTROSCOPY

Test GAM Matrix SOLID
 SDG 7716
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0388

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 2851-066					
BOV838	N904121-01		7716-001	20.6	65.5
BOV839	N904121-02		7716-002	54.2	8.14
BLK (QC ID=30582)	N904121-04		7716-004	U	U
LCS (QC ID=30581)	N904121-03		7716-003	ok	ok
Duplicate (N904121-01)	N904121-05		7716-005	ok	ok
Nominal values and limits from method		RDLs (pCi/g)		0.050	0.050
100 BC Areas-Quick Turn					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 2851-066		2σ prep error 15.0 %		Reference Lab		Notebook #2851		pg. 066							
BOV838	N904121-01		<u>0.94</u>	<u>193</u>					103			4	04/22/99	04/23	02,01,00
BOV839	N904121-02		<u>1.1</u>	<u>200</u>					103			4	04/22/99	04/23	02,03,00
BLK (QC ID=30582)	N904121-04		0.010	750					119				04/22/99	04/24	01,04,00
LCS (QC ID=30581)	N904121-03		0.018	750					104				04/22/99	04/23	01,04,00
Duplicate (N904121-01)	N904121-05		<u>0.87</u>	<u>193</u>					118			5	04/22/99	04/24	02,03,00
(QC ID=30583)															
Nominal values and limits from method			0.050	750					100						180

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

AVERAGES ± 2 SD MDA 0.59 ± 1.1
 FOR 5 SAMPLES YIELD _____ ± _____

METHOD SUMMARIES

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0388

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID

SDG 7716

Contact L.A. Johnson

Client Hanford

Contract TRB-SBB-207925

Case no SDG-H0388

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUP- PLANCHET	Nickel 63
------------------	---------------	--------------	---------------	-----------

Preparation batch 2851-066

B0V838	N904121-01	7716-001	712	
B0V839	N904121-02	7716-002	999	
BLK (QC ID=30582)	N904121-04	7716-004	U	
LCS (QC ID=30581)	N904121-03	7716-003	ok	
Duplicate (N904121-01)	N904121-05	7716-005	ok	

Nominal values and limits from method RDLs (pCi/g) 20
100 BC Areas-Quick Turn

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUP- pCi/g	MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
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Preparation batch 2851-066 2σ prep error 10.0 % Reference Lab Notebook #2851 pg. 066

B0V838	N904121-01	2.3	0.500	77	100	12	04/29/99	05/01	LSC-005
B0V839	N904121-02	2.3	0.500	76	100	12	04/29/99	05/01	LSC-005
BLK (QC ID=30582)	N904121-04	2.1	0.500	87	100	04/29/99	05/01	LSC-005	
LCS (QC ID=30581)	N904121-03	2.0	0.500	88	100	04/29/99	05/01	LSC-005	
Duplicate (N904121-01)	N904121-05	2.4	0.500	73	100	12	04/29/99	05/01	LSC-005
(QC ID=30583)									

Nominal values and limits from method 20 0.500 10 180

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

AVERAGES ± 2 SD	MDA	<u>2.2</u>	±	<u>0.33</u>
FOR 5 SAMPLES	YIELD	<u>80</u>	±	<u>14</u>

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-CMS

Version 3.06

Report date 05/10/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0388

SDG 7716
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0388

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.

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0388

SDG 7716
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0388

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.

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0388

SDG 7716
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0388

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/10/99

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0388

SDG 7716
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0388

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

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LAB CONTROL SAMPLE

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

The following notes apply to this report:

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

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

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

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

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DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

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

1. A fixed percentage specified in the protocol.

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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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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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for the recovery.

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

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

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METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

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

MDAs are underlined if greater than the printed RDL.

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

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

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

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

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

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

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

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

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

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

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

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Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-001-154		Page 1 of 1	
Collector Fahlberg/Kerkow		Company Contact R Coffman		Telephone No. 373-6425		Project Coordinator TRENT, SJ		Price Code	
Project Designation 100 BC Areas - Quick Turn		Sampling Location 100 B/C		SAF No. B99-001		Data Turnaround 7/15/99			
Ice Chest No. SML 545		Field Logbook No. EL 1327-2		Method of Shipment Federal Express					
Shipped To TMA/REGRA 4/20/99		Offsite Property No. A990115		Bill of Lading/Air Bill No. A990115 423579524890					
COA									

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	Cool 4C	Cool 4C	Cool 4C	None							
	Type of Container	P	G	G	G	aG							
	No. of Container(s)	1	1	1	1	1							
Special Handling and/or Storage	Volume	20mL	60g	60mL	60mL	500mL							

SAMPLE ANALYSIS				Activity Scan	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA 8260A (TCL)	See item (2) in Special Instructions.					
					4/20/99	4/20/99	4/20/99						
Sample No.	Matrix *	Sample Date	Sample Time										
✓ BOV838	Soil	4/19/99	1415	X	X	X	X	X					
✓ BOV839	Soil	4/19/99	1503	X	X	X	X	X					
BOV840	Soil												

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *					
Relinquished By Doreen M... Date/Time 4/19/99 16:30	Received By R. Nielson Date/Time 4/19/99	Relinquished By REF 1B Date/Time 4/21/99 07:30	Received By S. GALE Date/Time 4/21/99 07:30	(1) ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV); Chromium Hex - 7196 (2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Cesium-134, Uranium-238); Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63				Soil Water Vapor Other Solid Other Liquid					
Relinquished By S. GALE Date/Time 4/21/99 08:00	Received By FED EX Date/Time 4-21-99	Relinquished By Fed Ex Date/Time 4-22-99 10:30	Received By R. Coffman Date/Time 4-22-99 10:30										
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 4-22-99 10:30
CoC No. B99-001-154
Container I.D. No. SML545 Requested TAT (Days) _____ P.O. Received Yes [] No []

INSPECTION

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

13. Was P.M. notified of any anomalies? Yes [] No [] Date _____
14. Received by [Signature] Date: 4-22-99 Time: 10:30

LOGIN

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

PROGRAM MANAGER

Sample holding times exceeded? Yes [] No []

Client Notified: Name _____ Date/time _____