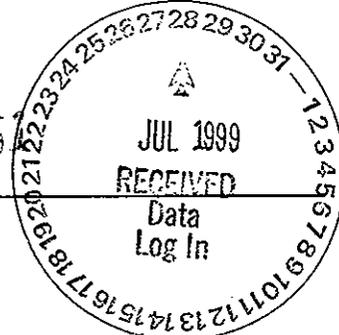




a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

0051751



Recra LabNet Philadelphia Analytical Report

Client : TNU-HANFORD B99-004

RFW# : 9907L386

SDG/SAF #: H04067B99-004

460 Log 07-21-99

SEMIVOLATILE

W.O. #: 10985-001-001-9999-00

Date Received: 07-08-99

Three (3) soil samples were collected on 07-06-99.

The samples and their associated QC samples were extracted on 07-09-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for Client Specified Semivolatile target compounds on 07-13-99.

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. The required holding times for extraction and analysis were met.
3. All surrogate recoveries were within EPA QC limits.
4. All matrix spike recoveries were within EPA QC limits.
5. The blank spike recovery was within EPA QC limits.



J. Michael Taylor

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

07-19-99

Date

som\group\data\bna\tnu07386.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 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, Special List

Report Date: 07/20/99 15:55

RFW Batch Number: 9907L386

Client: TNU-HANFORD B99-004

Work Order: 10985001001

Page: 1a

Sample Information	Cust ID:	B0VWX3	B0VWX3	B0VWX3	B0VWX4	B0VWX5	SBLKYV
	RFW#:	001	001 MS	001 MSD	002	003	99LE0802-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate	Nitrobenzene-d5	76 %	80 %	61 %	70 %	76 %	89 %
Recovery	2-Fluorobiphenyl	75 %	83 %	65 %	72 %	76 %	89 %
	p-Terphenyl-d14	95 %	100 %	89 %	84 %	88 %	102 %
	Phenol-d5	86 %	65 %	67 %	77 %	83 %	96 %
	2-Fluorophenol	83 %	64 %	64 %	77 %	83 %	98 %
	2,4,6-Tribromophenol	92 %	73 %	92 %	81 %	85 %	98 %
=====fl=====fl=====fl=====fl=====fl=====fl=====fl							
	Benzoic acid	860 U	860 U	860 U	860 U	840 U	840 U
	Pentachlorophenol	860 U	71 %	92 %	860 U	840 U	840 U
	Phenanthrene	340 U	340 U	340 U	340 U	18 J	330 U
	Di-n-Butylphthalate	340 U	340 U	340 U	340 U	340 U	330 U
	Fluoranthene	26 J	39 J	340 U	340 U	28 J	330 U
	bis(2-Ethylhexyl)phthalate	340 U	340 U	340 U	340 U	340 U	330 U
	Benzo(a)anthracene	340 U	25 J	340 U	340 U	340 U	330 U
	Chrysene	30 J	38 J	21 J	340 U	340 U	330 U
	Benzo(b)fluoranthene	39 J	39 J	24 J	340 U	340 U	330 U
	Benzo(k)fluoranthene	33 J	41 J	28 J	340 U	340 U	330 U
	Benzo(a)pyrene	340 U	18 J	340 U	340 U	340 U	330 U
	Indeno(1,2,3-cd)pyrene	22 J	24 J	18 J	340 U	340 U	330 U
	Benzo(g,h,i)perylene	27 J	29 J	22 J	340 U	340 U	330 U

*= Outside of EPA CLP QC limits.

04

Recra LabNet - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-004

DATE RECEIVED: 07/08/99

RFW LOT # :9907L386

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOVWX3	001	S	99LE0802	07/06/99	07/09/99	07/13/99
BOVWX3	001 MS	S	99LE0802	07/06/99	07/09/99	07/13/99
BOVWX3	001 MSD	S	99LE0802	07/06/99	07/09/99	07/13/99
BOVWX4	002	S	99LE0802	07/06/99	07/09/99	07/13/99
BOVWX5	003	S	99LE0802	07/06/99	07/09/99	07/13/99

LAB QC:

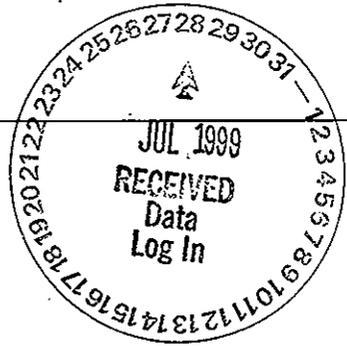
SBLKYV	MB1	S	99LE0802	N/A	07/09/99	07/13/99
SBLKYV	MB1 BS	S	99LE0802	N/A	07/09/99	07/13/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-004-072	Page 1 of 1
Collector RB Kerkow		Company Contact RB Kerkow		Telephone No. 509-531-0635		Project Coordinator TRENT, SJ	
Project Designation 100 D Arcas - Quick Turn		Sampling Location N. Effluent Pipelines		SAF No. B99-004		Price Code Data Turnaround 7 days	
Ice Chest No.		Field Logbook No. EL-1339-5		Method of Shipment Fed Ex			
Shipped To EPA/RECRA R. Felly 7.7.99		Offsite Property No.		Bill of Lading/Air Bill No.			
COA R100 DC 2FOO							

POSSIBLE SAMPLE HAZARDS/REMARKS PCBs, Radioactive	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None				
	Type of Container	aG	aG	aG	aG	aG	P				
	No. of Container(s)	1	1	1	1	1	1				
	Special Handling and/or Storage	Volume	60mL	60mL	60mL	60mL	60mL	750mL			

SAMPLE ANALYSIS				Chromium Hex - 71%	PCBs - 8080	See item (1) in Special Instructions.	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.			
Sample No.	Matrix *	Sample Date	Sample Time									
B0VWX3	Soil	7/6/99	1020	X	X	X	X	X				TIE TO B0VTD8
B0VWX4	Soil	7/6/99	0915	X	X	X	X	X				TIE TO B0VTD9
B0VWX5	Soil	7/6/99	0930	X	X	X	X	X				TIE TO B0VTF0

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By RB Kerkow		Date/Time 7/6/99 1630		Received By REF 1-C		Date/Time 7/6/99 1630		(1) Semi-VOA - 8270 Complete {Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Benzoic acid, Bis(2-ethylhexyl) phthalate, Butylbenzylphthalate, Chrysene, Di-n-butylphthalate, Fluoranthene, Indeno(1,2,3-cd)pyr (2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Silver}; Mercury - 7471 - (CV) (3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Uranium-238}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}; Isotopic Plutonium; Americium-241; Nickel-63; Strontium-8				Soil Water Vapor Other Solid Other Liquid	
Relinquished By REF 1-C		Date/Time 7.7.99 0800		Received By R. Felly		Date/Time 7.7.99 0800							
Relinquished By R. Felly		Date/Time 7.7.99 1330		Received By R. Felly		Date/Time							
Relinquished By Fed Ex		Date/Time 7/8/99 0930		Received By Fed Ex		Date/Time							
LABORATORY SECTION		Received By TR Murey				Title				Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method				Disposed By				Date/Time			



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-004
RFW# : 9907L386
SDG# : H0460
SAF# : B99-004

W.O. # : 10985-001-001-9999-00
Date Received: 07-08-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 3 soil samples.
2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.
3. Sample holding times as required by the method and/or contract were met.
4. The cooler temperature was recorded on the chain-of-custody.
5. The method blank for Chromium VI was within method criteria.
6. The Laboratory Control Samples (LCS) for Chromium VI 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% RPD control limit.
9. Results for Chromium VI solid samples are reported on a dry weight basis.

for 

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

7-23-99
Date

njpli07-386

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.

001

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			✓ 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: SW.3060A/7196A

002

Recra LabNet Philadelphia
METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.
2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
 - a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).
 - b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).
 - c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
 - d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
 - e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
 - f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 07/19/99

CLIENT: TNU-HANFORD B99-004
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9907L386

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
-001	BOVWX3	% Solids	97.5	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-002	BOVWX4	% Solids	97.7	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-003	BOVWX5	% Solids	99.0	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/19/99

CLIENT: TNU-HANFORD B99-004
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9907L386

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVI052-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 07/19/99

CLIENT: TNU-HANFORD B99-004

RECRA LOT #: 9907L386

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-003	BOVMX5	Soluble Chromium VI	4.3	<i>MS-0.1</i> 0.40u	4.0	<i>MS-7.21-99</i> 100.5 107.5%	1.0
		Insoluble Chromium VI	1170	<i>MS-0.1</i> 0.40u	1190	98.4	100
BLANK10	99LVI052-MB1	Soluble Chromium VI	4.0	0.40u	4.0	100.3	1.0
		Insoluble Chromium VI	1060	0.40u	1160	90.7	100

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 07/19/99

CLIENT: TNU-HANFORD B99-004
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9907L386

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION
			RESULT	REPLICATE	RPD	
-003REP	B0VWX5	% Solids	99.0	99.0	0.00	1.0
		Chromium VI	0.40u	0.40u	NC	1.0

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-004

DATE RECEIVED: 07/08/99

RFW LOT # :9907L386

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

B0VWX3

% SOLIDS	001	S	99L%S095	07/06/99	07/08/99	07/09/99
CHROMIUM VI	001	S	99LVI052	07/06/99	07/14/99	07/14/99

B0VWX4

% SOLIDS	002	S	99L%S095	07/06/99	07/08/99	07/09/99
CHROMIUM VI	002	S	99LVI052	07/06/99	07/14/99	07/14/99

B0VWX5

% SOLIDS	003	S	99L%S095	07/06/99	07/08/99	07/09/99
% SOLIDS	003 REP	S	99L%S095	07/06/99	07/08/99	07/09/99
CHROMIUM VI	003	S	99LVI052	07/06/99	07/14/99	07/14/99
CHROMIUM VI	003 REP	S	99LVI052	07/06/99	07/14/99	07/14/99
CHROMIUM VI	003 MS	S	99LVI052	07/06/99	07/14/99	07/14/99
CHROMIUM VI	003 MSD	S	99LVI052	07/06/99	07/14/99	07/14/99

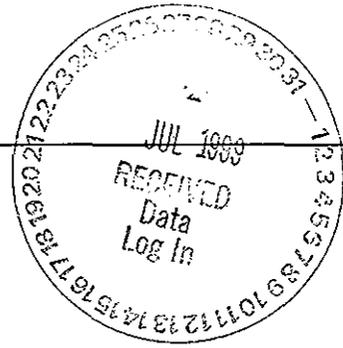
LAB QC:

CHROMIUM VI	MB1	S	99LVI052	N/A	07/14/99	07/14/99
CHROMIUM VI	MB1 BS	S	99LVI052	N/A	07/14/99	07/14/99
CHROMIUM VI	MB1 BSD	S	99LVI052	N/A	07/14/99	07/14/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-004-072		Page 1 of 1	
Collector RB Kerkow		Company Contact RB Kerkow		Telephone No. 509-531-0635		Project Coordinator Trent, SJ		Price Code	
Project Designation 100 D Areas - Quick Turn		Sampling Location N. Effluent Pipelines		SAF No. B99-004		Data Turnaround 7 days			
Ice Chest No.		Field Logbook No. EL-1339-5		Method of Shipment Fed Ex					
Shipped To FMA/RECRA R. Kelly 7-7-99		Offsite Property No.		Bill of Lading/Air Bill No. COA R100 DC 2FOO					

POSSIBLE SAMPLE HAZARDS/REMARKS PCBs, Radioactive	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None				
	Type of Container	aG	aG	aG	aG	aG	P				
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1	1				
	Volume	60mL	60mL	60mL	60mL	60mL	750mL				
SAMPLE ANALYSIS		Chromium Hex - 71%	PCBs - 8080	See item (1) in Special Instructions	VOA - 8260A (TCL)	See item (2) in Special Instructions	See item (3) in Special Instructions				
Sample No.	Matrix *	Sample Date	Sample Time								
B0VWX3	Soil	7/6/99	1022	X	X	X	X	X			TIE TO B0VTD8
B0VWX4	Soil	7/6/99	0915	X	X	X	X	X			TIE TO B0VTD9
B0VWX5	Soil	7/6/99	0930	X	X	X	X	X			TIE TO B0VTF0

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By RB Kerkow Date/Time 7/6/99 1630		Received By REF LC Date/Time 7/6/99 1630		(1) Semi-VOA - 8270 Complete {Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Benzoic acid, Bis(2-ethylhexyl) phthalate, Butylbenzylphthalate, Chrysene, Di-n-butylphthalate, Fluoranthene, Indeno(1,2,3-cd)pyr (2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Silver}; Mercury - 7471 - (CV) (3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Uranium-238}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}; Isotopic Plutonium; Americium-241; Nickel-63; Strontium-8				Soil Water Vapor Other Solid Other Liquid			
Relinquished By REF LC Date/Time 7-7-99 0800		Received By R. Kelly Date/Time 7-7-99 0800									
Relinquished By R. Kelly Date/Time 1330		Received By R. Kelly Date/Time 7-7-99									
Relinquished By Fed Ex Date/Time 7-7-99		Received By Fed Ex Date/Time 7-7-99									
Relinquished By Fed Ex Date/Time 7/8/99 0930		Received By TR Murray Date/Time 7/8/99 0930									
LABORATORY SECTION		Received By				Title				Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method				Disposed By				Date/Time	



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-004
RFW# : 9907L386
SDG/SAF# : H0460/B99-004

W.O.# : 10985-001-001-9999-00
Date Received: 07-08-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 3 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 (80-120% for Mercury).
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks 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. When the Mercury matrix spike is out of control, a serial dilution is performed.

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 **3** pages.

001

11. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

fa *Maureen L. Doughty*

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

mld/m07-386

7/15/99
Date



METALS METHOD GLOSSARY

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

Recre Lot#: 9907L386

Leaching Procedure: 1310 1311 1312 Other: _____

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

Metals Digestion Methods: 3005A 3010A 3015 3020A 3050A 3051 200.7 SS17
 Other: _____

Metals Analysis Methods

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

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.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 07/15/99

CLIENT: TNU-HANFORD B99-004
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9907L386

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0VWX3	Silver, Total	0.10	u MG/KG	0.10	1.0
		Arsenic, Total	1.8	MG/KG	0.17	1.0
		Barium, Total	59.6	MG/KG	0.01	1.0
		Cadmium, Total	0.07	MG/KG	0.02	1.0
		Chromium, Total	12.0	MG/KG	0.04	1.0
		Mercury, Total	0.16	MG/KG	0.02	1.0
		Lead, Total	2.2	MG/KG	0.21	1.0
-002	B0VWX4	Silver, Total	0.14	u MG/KG	0.14	1.0
		Arsenic, Total	1.6	MG/KG	0.24	1.0
		Barium, Total	55.5	MG/KG	0.02	1.0
		Cadmium, Total	0.14	MG/KG	0.03	1.0
		Chromium, Total	5.8	MG/KG	0.06	1.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Lead, Total	2.9	MG/KG	0.30	1.0
-003	B0VWX5	Silver, Total	0.13	u MG/KG	0.13	1.0
		Arsenic, Total	1.4	MG/KG	0.21	1.0
		Barium, Total	59.2	MG/KG	0.02	1.0
		Cadmium, Total	0.10	MG/KG	0.03	1.0
		Chromium, Total	3.2	MG/KG	0.05	1.0
		Mercury, Total	0.02	u MG/KG	0.02	1.0
		Lead, Total	2.6	MG/KG	0.26	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/15/99

CLIENT: TNU-HANFORD B99-004

RECRA LOT #: 9907L386

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
*****	*****	*****	*****	*****	*****	*****
BLANK1	99L0466-MB1	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Arsenic, Total	0.23 u	MG/KG	0.23	1.0
		Barium, Total	0.02 u	MG/KG	0.02	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.06 u	MG/KG	0.06	1.0
		Lead, Total	0.29 u	MG/KG	0.29	1.0
BLANK1	99C0198-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 07/15/99

CLIENT: TNU-HANFORD B99-004

RECRA LOT #: 9907L386

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	B0VWX3	Silver, Total	3.9	0.10u	4.2	92.9	1.0
		Arsenic, Total	156	1.8	167	92.7	1.0
		Barium, Total	215	59.6	167	93.1	1.0
		Cadmium, Total	3.9	0.07	4.2	91.1	1.0
		Chromium, Total	25.5	12.0	16.7	80.8	1.0
		Mercury, Total	0.36	0.16	0.16	127.1	1.0
		Lead, Total	40.9	2.2	41.7	92.8	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 07/15/99

CLIENT: TNU-HANFORD B99-004

RECRA LOT #: 9907L386

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REF)
			RESULT	REPLICATE	RPD	
-001REP	B0VWX3	Silver, Total	0.10u	0.11u	NC	1.0
		Arsenic, Total	1.8	1.5	18.2	1.0
		Barium, Total	59.6	55.6	6.9	1.0
		Cadmium, Total	0.07	0.05	30.4	1.0
		Chromium, Total	12.0	11.0	8.7	1.0
		Mercury, Total	0.16	0.13	21.8	1.0
		Lead, Total	2.2	2.3	4.4	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/15/99

CLIENT: TNU-HANFORD B99-004

RECRA LOT #: 9907L386

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

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV.
			SAMPLE	AMOUNT		
LCS1	99L0466-LC1	Silver, LCS	49.0	50.0	MG/KG	98.0
		Arsenic, LCS	944	1000	MG/KG	94.4
		Barium, LCS	484	500	MG/KG	96.9
		Cadmium, LCS	24.1	25.0	MG/KG	96.4
		Chromium, LCS	49.1	50.0	MG/KG	98.2
		Lead, LCS	240	250	MG/KG	95.9
LCS1	99C0198-LC1	Mercury, LCS	0.94	1.0	MG/KG	93.8

Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-004

DATE RECEIVED: 07/08/99

RFW LOT # :9907L386

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0VWX3						
SILVER, TOTAL	001	S	99L0466	07/06/99	07/09/99	07/11/99
SILVER, TOTAL	001 REP	S	99L0466	07/06/99	07/09/99	07/11/99
SILVER, TOTAL	001 MS	S	99L0466	07/06/99	07/09/99	07/11/99
ARSENIC, TOTAL	001	S	99L0466	07/06/99	07/09/99	07/11/99
ARSENIC, TOTAL	001 REP	S	99L0466	07/06/99	07/09/99	07/11/99
ARSENIC, TOTAL	001 MS	S	99L0466	07/06/99	07/09/99	07/11/99
BARIUM, TOTAL	001	S	99L0466	07/06/99	07/09/99	07/11/99
BARIUM, TOTAL	001 REP	S	99L0466	07/06/99	07/09/99	07/11/99
BARIUM, TOTAL	001 MS	S	99L0466	07/06/99	07/09/99	07/11/99
CADMIUM, TOTAL	001	S	99L0466	07/06/99	07/09/99	07/11/99
CADMIUM, TOTAL	001 REP	S	99L0466	07/06/99	07/09/99	07/11/99
CADMIUM, TOTAL	001 MS	S	99L0466	07/06/99	07/09/99	07/11/99
CHROMIUM, TOTAL	001	S	99L0466	07/06/99	07/09/99	07/11/99
CHROMIUM, TOTAL	001 REP	S	99L0466	07/06/99	07/09/99	07/11/99
CHROMIUM, TOTAL	001 MS	S	99L0466	07/06/99	07/09/99	07/11/99
MERCURY, TOTAL	001	S	99C0198	07/06/99	07/12/99	07/13/99
MERCURY, TOTAL	001 REP	S	99C0198	07/06/99	07/12/99	07/13/99
MERCURY, TOTAL	001 MS	S	99C0198	07/06/99	07/12/99	07/13/99
LEAD, TOTAL	001	S	99L0466	07/06/99	07/09/99	07/11/99
LEAD, TOTAL	001 REP	S	99L0466	07/06/99	07/09/99	07/11/99
LEAD, TOTAL	001 MS	S	99L0466	07/06/99	07/09/99	07/11/99

B0VWX4

SILVER, TOTAL	002	S	99L0466	07/06/99	07/09/99	07/11/99
ARSENIC, TOTAL	002	S	99L0466	07/06/99	07/09/99	07/11/99
BARIUM, TOTAL	002	S	99L0466	07/06/99	07/09/99	07/11/99
CADMIUM, TOTAL	002	S	99L0466	07/06/99	07/09/99	07/11/99
CHROMIUM, TOTAL	002	S	99L0466	07/06/99	07/09/99	07/11/99
MERCURY, TOTAL	002	S	99C0198	07/06/99	07/12/99	07/13/99
LEAD, TOTAL	002	S	99L0466	07/06/99	07/09/99	07/11/99

B0VWX5

SILVER, TOTAL	003	S	99L0466	07/06/99	07/09/99	07/11/99
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Recra LabNet - Lionville Laboratory
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-004

DATE RECEIVED: 07/08/99

RFW LOT # :9907L386

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	003	S	99L0466	07/06/99	07/09/99	07/11/99
BARIUM, TOTAL	003	S	99L0466	07/06/99	07/09/99	07/11/99
CADMIUM, TOTAL	003	S	99L0466	07/06/99	07/09/99	07/11/99
CHROMIUM, TOTAL	003	S	99L0466	07/06/99	07/09/99	07/11/99
MERCURY, TOTAL	003	S	99C0198	07/06/99	07/12/99	07/13/99
LEAD, TOTAL	003	S	99L0466	07/06/99	07/09/99	07/11/99

LAB QC:

SILVER LABORATORY	LC1 BS	S	99L0466	N/A	07/09/99	07/11/99
SILVER, TOTAL	MB1	S	99L0466	N/A	07/09/99	07/11/99
ARSENIC LABORATORY	LC1 BS	S	99L0466	N/A	07/09/99	07/11/99
ARSENIC, TOTAL	MB1	S	99L0466	N/A	07/09/99	07/11/99
BARIUM LABORATORY	LC1 BS	S	99L0466	N/A	07/09/99	07/11/99
BARIUM, TOTAL	MB1	S	99L0466	N/A	07/09/99	07/11/99
CADMIUM LABORATORY	LC1 BS	S	99L0466	N/A	07/09/99	07/11/99
CADMIUM, TOTAL	MB1	S	99L0466	N/A	07/09/99	07/11/99
CHROMIUM LABORATORY	LC1 BS	S	99L0466	N/A	07/09/99	07/11/99
CHROMIUM, TOTAL	MB1	S	99L0466	N/A	07/09/99	07/11/99
MERCURY LABORATORY	LC1 BS	S	99C0198	N/A	07/12/99	07/13/99
MERCURY, TOTAL	MB1	S	99C0198	N/A	07/12/99	07/13/99
LEAD LABORATORY	LC1 BS	S	99L0466	N/A	07/09/99	07/11/99
LEAD, TOTAL	MB1	S	99L0466	N/A	07/09/99	07/11/99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-004-072		Page 1 of 1.3	
Collector RB Kerkow		Company Contact RB Kerkow		Telephone No. 509-531-0635		Project Coordinator TRENT, SJ		Price Code	
Project Designation 100 D Areas - Quick Turn		Sampling Location N. Effluent Pipelines		SAF No. B99-004				Data Turnaround 7 days	
Ice Chest No.		Field Logbook No. EL-1339-5		Method of Shipment Fed Ex					
Shipped To EPA/RECRA R. Kelly 7.7.99		Offsite Property No.		Bill of Lading/Air Bill No.					
				COA R100 DC 2 F00					

POSSIBLE SAMPLE HAZARDS/REMARKS PCBs, Radioactive	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None				
	Type of Container	aG	aG	aG	aG	aG	P				
	No. of Container(s)	1	1	1	1	1	1				
Special Handling and/or Storage	Volume	60mL	60mL	60mL	60mL	60mL	750mL				

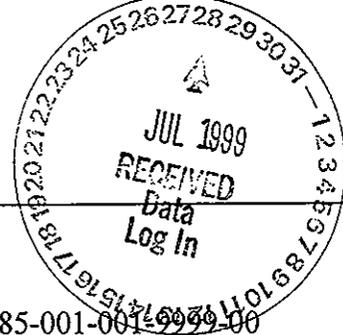
SAMPLE ANALYSIS				Chromium Hex - 7196	PCBs - 8080	See item (1) in Special Instructions.	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.			
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Sample No.	Matrix *	Sample Date	Sample Time									
B0VWX3	Soil	7/6/99	1022	X	X	X	X	X				TIE TO B0VTD8
B0VWX4	Soil	7/6/99	0915	X	X	X	X	X				TIE TO B0VTD9
B0VWX5	Soil	7/6/99	0930	X	X	X	X	X				TIE TO B0VTF0

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By RB Kerkow Date/Time 7/6/99 1630		Received By REF 1-C Date/Time 7/6/99 1630				(1) Semi-VOA - 8270 Complete (Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Benzoic acid, Bis(2-ethylhexyl) phthalate, Butylbenzylphthalate, Chrysene, Di-n-butylphthalate, Fluoranthene, Indeno(1,2,3-cd)pyr (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Silver); Mercury - 7471 -(CV) (3) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238); Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Isotopic Plutonium; Americium-241; Nickel-63; Strontium-8				Soil Water Vapor Other Solid Other Liquid	
Relinquished By Ref 1-C Date/Time 7.7.99 0800		Received By R. Kelly Date/Time 7.7.99 0800									
Relinquished By R. Kelly Date/Time 7.7.99 1330		Received By Fed Ex Date/Time									
Relinquished By Fed Ex Date/Time 7/8/99 0930		Received By T. M. M... Date/Time 7/8/99 0930									

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

**Recra LabNet Philadelphia
Analytical Report**



Client: TNU-HANFORD B99-004
RFW#: 9907L386
SDG/SAF#: H0460/B99-004

W.O.#: 10985-001-001-9999-00
Date Received: 07-08-99

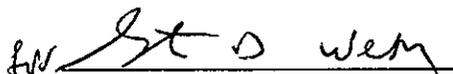
PCB

Three (3) soil samples were collected on 07-06-99.

The samples and their associated QC samples were extracted on 07-09-99 and analyzed based on SW846, 3rd Edition procedures on 07-12-99. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

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

1. The cooler temperature has been recorded on the chain-of-custody.
2. The required holding times for extraction and analysis were met.
3. The samples and their associated QC samples received a sulfuric acid and sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. One (1) of fourteen (14) surrogate recoveries was outside acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

07-15-99
Date

son\group\data\pest\tnu07386.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 7 pages.

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

ABBREVIATIONS

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- DF = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



GLOSSARY OF PESTICIDE/PCB DATA

- P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C** = This flag applies to a compound that has been confirmed by GC/MS.



Recra LabNet - Lionville Laboratory

PCBs by GC

Report Date: 07/13/99 12:02

RFW Batch Number: 9907L386

Client: TNU-HANFORD B99-004

Work Order: 10985001001 Page: 1

04

Sample Information	Cust ID:	B0VWX3	B0VWX3	B0VWX3	B0VWX4	B0VWX5	PBLKNT
	RFW#:	001	001 MS	001 MSD	002	003	99LE0800-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	108 %	85 %	82 %	128 * %	112 %	118 %
	Decachlorobiphenyl	97 %	86 %	79 %	120 %	96 %	103 %
		=====fl=====	=====fl=====	=====fl=====	=====fl=====	=====fl=====	=====fl=====
Aroclor-1016		34 U	68 U	68 U	34 U	34 U	33 U
Aroclor-1221		68 U	140 U	140 U	68 U	67 U	67 U
Aroclor-1232		34 U	68 U	68 U	34 U	34 U	33 U
Aroclor-1242		34 U	68 U	68 U	34 U	34 U	33 U
Aroclor-1248		34 U	68 U	68 U	34 U	34 U	33 U
Aroclor-1254		34 U	78 %	70 %	34 U	34 U	33 U
Aroclor-1260		34 U	68 U	68 U	34 U	34 U	33 U

Cust ID: PBLKNT BS

Sample Information	RFW#:	99LE0800-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	UG/KG

Surrogate:	Tetrachloro-m-xylene	70 %
	Decachlorobiphenyl	66 %
		=====fl=====
Aroclor-1016		33 U
Aroclor-1221		67 U
Aroclor-1232		33 U
Aroclor-1242		33 U
Aroclor-1248		33 U
Aroclor-1254		56 %
Aroclor-1260		33 U

rw
07-14-99

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

Recra LabNet - Lionville Laboratory
PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-004

DATE RECEIVED: 07/08/99

RFW LOT # :9907L386

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOVWX3	001	S	99LE0800	07/06/99	07/09/99	07/12/99
BOVWX3	001 MS	S	99LE0800	07/06/99	07/09/99	07/12/99
BOVWX3	001 MSD	S	99LE0800	07/06/99	07/09/99	07/12/99
BOVWX4	002	S	99LE0800	07/06/99	07/09/99	07/12/99
BOVWX5	003	S	99LE0800	07/06/99	07/09/99	07/12/99

LAB QC:

PBLKNT	MB1	S	99LE0800	N/A	07/09/99	07/12/99
PBLKNT	MB1 BS	S	99LE0800	N/A	07/09/99	07/12/99

aj
07-14-99

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-004-072		Page 1 of 1	
Collector RB Kerkow		Company Contact RB Kerkow		Telephone No. 509-531-0635		Project Coordinator TRENT, SJ		Price Code	
Project Designation 100 D Areas - Quick Turn		Sampling Location N. Effluent Pipelines		SAF No. B99-004		Data Turnaround 7 days			
Ice Chest No.		Field Logbook No. EL-1339-5		Method of Shipment Fed Ex					
Shipped To EPA/RECRA R. Feldman 7-7-99		Offsite Property No.		Bill of Lading/Air Bill No. COA R100DC 2F00					

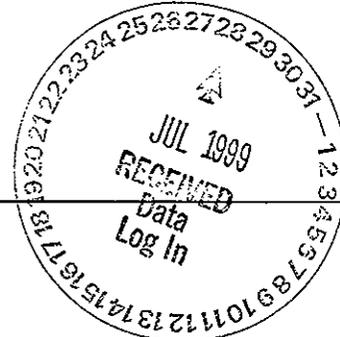
POSSIBLE SAMPLE HAZARDS/REMARKS PCBs, Radioactive	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None				
	Type of Container	aG	aG	aG	aG	aG	P				
	No. of Container(s)	1	1	1	1	1	1				
Special Handling and/or Storage	Volume	60mL	60mL	60mL	60mL	60mL	750mL				

SAMPLE ANALYSIS				Chromium Hex - 7196	PCBs - 8080	See item (1) in Special Instructions.	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.			
-----------------	--	--	--	---------------------	-------------	---------------------------------------	-------------------	---------------------------------------	---------------------------------------	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time									
B0VWX3	Soil	7/6/99	1020	X	X	X	X	X				TIE TO B0VTD8
B0VWX4	Soil	7/6/99	0915	X	X	X	X	X				TIE TO B0VTD9
B0VWX5	Soil	7/6/99	0930	X	X	X	X	X				TIE TO B0VTF0

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS						Matrix *			
Relinquished By RB Kerkow		Date/Time 7/6/99 1630		Received By REF 1-C		Date/Time 7/6/99 1630		(1) Semi-VOA - 8270 Complete (Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Benzoic acid, Bis(2-ethylhexyl) phthalate, Butylbenzylphthalate, Chrysene, Di-n-butylphthalate, Fluoranthene, Indeno(1,2,3-cd)pyr (2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Silver}; Mercury - 7471 - (CV) (3) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on {Americium-241, Uranium-238}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}; Isotopic Plutonium; Americium-241; Nickel-63; Strontium-8						Soil Water Vapor Other Solid Other Liquid	
Relinquished By REF 1-C		Date/Time 7-7-99 0800		Received By R. Feldman		Date/Time 7-7-99 0800									
Relinquished By R. Feldman		Date/Time 7-7-99 1330		Received By R. Feldman		Date/Time 7-7-99									
Relinquished By Fed Ex		Date/Time 7/8/99 0930		Received By J. Murray		Date/Time 7/8/99 0930									

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



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-004

RFW# : 9907L386

SDG/SAF #: H0460/B99-004

W.O. #: 10985-001-001-9999-00

Date Received: 07-08-99

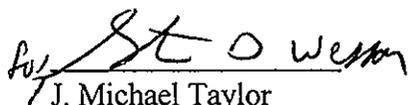
GC/MS VOLATILE

Three (3) soil samples were collected on 07-06-99.

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 07-12-99.

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 99LVN203-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 and Acetone at levels less than the CRQL.



J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

som\group\data\voa\tnu07386.doc

07-19-99

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 14 pages.

GLOSSARY OF VOA DATA

DATA QUALIFIERS

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



GLOSSARY OF VOA DATA

ABBREVIATIONS

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



Recra LabNet - Lionville Laboratory

Volatiles by GC/MS, HSL List

Report Date: 07/13/99 12:31

04

RFW Batch Number: 9907L386

Client: TNU-HANFORD B99-004

Work Order: 10985001001 Page: 1a

Sample Information	Cust ID:	B0VWX3	B0VWX3	B0VWX3	B0VWX4	B0VWX5	VBLK10
	RFW#:	001	001 MS	001 MSD	002	003	99LVN203-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.02	1.04	1.04	1.04	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate	Toluene-d8	102 %	101 %	101 %	106 %	105 %	103 %
Recovery	Bromofluorobenzene	91 %	91 %	86 %	93 %	90 %	94 %
	1,2-Dichloroethane-d4	93 %	94 %	95 %	99 %	97 %	94 %
=====fl=====fl=====fl=====fl=====fl=====fl=====fl=====							
Chloromethane		10 U	11 U	11 U	11 U	10 U	10 U
Bromomethane		10 U	11 U	11 U	11 U	10 U	10 U
Vinyl Chloride		10 U	11 U	11 U	11 U	10 U	10 U
Chloroethane		10 U	11 U	11 U	11 U	10 U	10 U
Methylene Chloride		9 B	9 B	9 B	9 B	9 B	2 J
Acetone		3 JB	3 JB	3 JB	3 JB	3 JB	1 J
Carbon Disulfide		5 U	6 U	6 U	6 U	5 U	5 U
1,1-Dichloroethene		5 U	95 %	91 %	6 U	5 U	5 U
1,1-Dichloroethane		5 U	6 U	6 U	6 U	5 U	5 U
1,2-Dichloroethene (total)		5 U	6 U	6 U	6 U	5 U	5 U
Chloroform		5 U	6 U	6 U	6 U	5 U	5 U
1,2-Dichloroethane		5 U	6 U	6 U	6 U	5 U	5 U
2-Butanone		10 U	11 U	11 U	11 U	10 U	10 U
1,1,1-Trichloroethane		5 U	6 U	6 U	6 U	5 U	5 U
Carbon Tetrachloride		5 U	6 U	6 U	6 U	5 U	5 U
Bromodichloromethane		5 U	6 U	6 U	6 U	5 U	5 U
1,2-Dichloropropane		5 U	6 U	6 U	6 U	5 U	5 U
cis-1,3-Dichloropropene		5 U	6 U	6 U	6 U	5 U	5 U
Trichloroethene		5 U	106 %	105 %	6 U	5 U	5 U
Dibromochloromethane		5 U	6 U	6 U	6 U	5 U	5 U
1,1,2-Trichloroethane		5 U	6 U	6 U	6 U	5 U	5 U
Benzene		5 U	100 %	98 %	6 U	5 U	5 U
Trans-1,3-Dichloropropene		5 U	6 U	6 U	6 U	5 U	5 U
Bromoform		5 U	6 U	6 U	6 U	5 U	5 U
4-Methyl-2-pentanone		10 U	11 U	11 U	11 U	10 U	10 U
2-Hexanone		10 U	11 U	11 U	11 U	10 U	10 U
Tetrachloroethene		5 U	6 U	6 U	6 U	5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	6 U	6 U	6 U	5 U	5 U
Toluene		5 U	107 %	102 %	6 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Cust ID: BOVWX3 BOVWX3 BOVWX3 BOVWX4 BOVWX5 VBLKIO

RFW#: 001 001 MS 001 MSD 002 003 99LVN203-MB1

	001	001 MS	001 MSD	002	003	99LVN203-MB1
Chlorobenzene	5 U	106 %	102 %	6 U	5 U	5 U
Ethylbenzene	5 U	6 U	6 U	6 U	5 U	5 U
Styrene	5 U	6 U	6 U	6 U	5 U	5 U
Xylene (total)	5 U	6 U	6 U	6 U	5 U	5 U

*= Outside of EPA CLP QC limits.

Cust ID: VBLKIO BS

RFW#: 99LVN203-MB1

Chlorobenzene	106	%
Ethylbenzene	5	U
Styrene	5	U
Xylene (total)	5	U

*= Outside of EPA CLP QC limits.

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOVWX3

Lab Name: Recra.LabNet Contract: 10985001001

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

Matrix: (soil/water) SOIL Lab Sample ID: 9907L386-001

Sample wt/vol: 4.90 (g/mL) G Lab File ID: n071207

Level: (low/med) LOW Date Received: 07/08/99

% Moisture: not dec. _____2 Date Analyzed: 07/12/99

Column: (pack/cap) CAP Dilution Factor: 1.02

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

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

08

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BOVWX4

Lab Name: Recra.LabNet Contract: 10985001001

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

Matrix: (soil/water) SOIL Lab Sample ID: 9907L386-002

Sample wt/vol: 4.80 (g/mL) G Lab File ID: n071208

Level: (low/med) LOW Date Received: 07/08/99

% Moisture: not dec. _____ 2 Date Analyzed: 07/12/99

Column: (pack/cap) CAP Dilution Factor: 1.04

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

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

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0VWX5

Lab Name: Recra.LabNet Contract: 10985001001

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

Matrix: (soil/water) SOIL Lab Sample ID: 9907L386-003

Sample wt/vol: 5.00 (g/mL) G Lab File ID: n071209

Level: (low/med) LOW Date Received: 07/08/99

% Moisture: not dec. _____1 Date Analyzed: 07/12/99

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.				

1E
VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKIO

Lab Name: Recra.LabNet Contract: 10985001001

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

Matrix: (soil/water) SOIL Lab Sample ID: 99LVN203-MB1

Sample wt/vol: 5.00 (g/mL) G Lab File ID: n071204

Level: (low/med) LOW Date Received: 07/12/99

% Moisture: not dec. _____0 Date Analyzed: 07/12/99

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 1 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	16.6	4	J

Recra LabNet - Lionville Laboratory
 VOA ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B99-004

DATE RECEIVED: 07/08/99

RFW LOT # :9907L386

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0VWX3	001	S	99LVN203	07/06/99	N/A	07/12/99
B0VWX3	001 MS	S	99LVN203	07/06/99	N/A	07/12/99
B0VWX3	001 MSD	S	99LVN203	07/06/99	N/A	07/12/99
B0VWX4	002	S	99LVN203	07/06/99	N/A	07/12/99
B0VWX5	003	S	99LVN203	07/06/99	N/A	07/12/99

LAB QC:

VBLKIO	MB1	S	99LVN203	N/A	N/A	07/12/99
VBLKIO	MB1 BS	S	99LVN203	N/A	N/A	07/12/99

Collector RB Kerkow	Company Contact RB Kerkow	Telephone No. 509-531-0635	Project Coordinator TRENT, SJ	Price Code	Data Turnaround
Project Designation 100 D Areas - Quick Turn	Sampling Location N. Effluent Pipelines	SAF No. 1399-004	7 days		
Ice Chest No.	Field Logbook No. EL-1339-5	Method of Shipment Fed Ex			
Shipped To FMA/RECRA R. Felder 7-7-99	Offsite Property No.	Bill of Lading/Air Bill No.			
COA R100 DC 2FOO					

POSSIBLE SAMPLE HAZARDS/REMARKS PCBs, Radioactive	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
	Type of Container	aG	aG	aG	aG	aG	P			
	No. of Container(s)	1	1	1	1	1	1			
Special Handling and/or Storage	Volume	60mL	60mL	60mL	60mL	60mL	750mL			

SAMPLE ANALYSIS				Chromium Hex - 7196	PCBs - 8080	See item (1) in Special Instructions.	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.		
-----------------	--	--	--	---------------------	-------------	---------------------------------------	-------------------	---------------------------------------	---------------------------------------	--	--

Sample No.	Matrix *	Sample Date	Sample Time								
BOVWX3	Soil	7/6/99	1020	X	X	X	X	X			TIE TO BOVTD8
BOVWX4	Soil	7/6/99	0915	X	X	X	X	X			TIE TO BOVTD9
BOVWX5	Soil	7/6/99	0930	X	X	X	X	X			TIE TO BOVTF0

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS					Matrix *
Relinquished By RB Kerkow Date/Time 7/6/99 1630	Received By REF 1 C Date/Time 7/6/99 1630	(1) Semi-VOA - 8270 Complete (Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Benzoic acid, Bis(2-ethylhexyl) phthalate, Butylbenzylphthalate, Chrysene, Di-n-butylphthalate, Fluoranthene, Indeno(1,2,3-cd)pyr (2) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Silver}; Mercury - 7471 - (CV) (3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Uranium-238}; Isotopic Uranium {Uranium-233/234, Uranium-235, Uranium-238}; Isotopic Plutonium; Americium-241; Nickel-63; Strontium-8					Soil Water Vapor Other Solid Other Liquid	
Relinquished By Ref 1-C Date/Time 7-7-99 0800	Received By R. Felder Date/Time 7-7-99 0800							
Relinquished By R. Felder Date/Time 1330	Received By Fed Ex Date/Time							
Relinquished By Fed Ex Date/Time 7/8/99 0930	Received By T. Murray Date/Time 7/8/99 0930							

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

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0460 is comprised of three solid (soil) samples designated under SAF No. B99-004 with a Project Designation of: 100 D Areas-Quick Turn.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist. Data for Gamma Scan, Isotopic Uranium, Isotopic Plutonium, and Total Strontium was faxed to BHI on July 16, 1999; Data for Americium-241 and Nickel-63 was transmitted to BHI on July 26, 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

The aliquot for the analysis was reduced to 0.1g to expedite sample processing. As a consequence the sample MDA's are greater than the RDL. Positive Sr-90 activity was not detected in any of the samples.

2.3 Isotopic Plutonium Analyses

No problems were encountered during the processing of the samples.

2.4 Gamma Scan Analyses

No problems were encountered during the processing of the samples.

2.5 Isotopic Uranium Analyses

No problems were encountered during the processing of the samples.

2.6 Americium-241 Analyses

No problems were encountered during the processing of the samples.



TMA/RICHMOND

SAMPLE DELIVERY GROUP H0460

SDG 7724
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0460

SAMPLE SUMMARY

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB		CHAIN OF	
				SAMPLE ID	SAF NO	CUSTODY	COLLECTED
B0VWX3	N. Effluent Pipelines	SOLID		N907034-01	B99-004	B99-004-072	07/06/99 10:20
B0VWX4	N. Effluent Pipelines	SOLID		N907034-02	B99-004	B99-004-072	07/06/99 09:15
B0VWX5	N. Effluent Pipelines	SOLID		N907034-03	B99-004	B99-004-072	07/06/99 09:30
Method Blank		SOLID		N907034-05	B99-004		
Lab Control Sample		SOLID		N907034-04	B99-004		
Duplicate (N907034-01)	N. Effluent Pipelines	SOLID		N907034-06	B99-004		07/06/99 10:20

SAMPLE SUMMARY

Page 1

SUMMARY DATA SECTION

Page 3

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-CS
 Version 3.06
 Report date 07/29/99

TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0460

SDG 7724
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0460

QC SUMMARY

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7724	B99-004-072	B0VWX3	SOLID	95.6			07/08/99	2	N907034-01	7724-001
		B0VWX4	SOLID	96.8			07/08/99	2	N907034-02	7724-002
		B0VWX5	SOLID	96.8			07/08/99	2	N907034-03	7724-003
		Method Blank	SOLID						N907034-05	7724-005
		Lab Control Sample	SOLID						N907034-04	7724-004
		Duplicate (N907034-01)	SOLID	95.6			07/08/99	2	N907034-06	7724-006

QC SUMMARY

Page 1

SUMMARY DATA SECTION

Page 4

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-QS
 Version 3.06
 Report date 07/29/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0460

SDG 7724
 Contact L.A. Johnson

PREP BATCH SUMMARY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0460

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI- FIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Alpha Spectroscopy										
AM	SOLID	Americium 241 in Soil	2851-094	5.0	3			1	1	1/1
PU	SOLID	Plutonium, Isotopic in Solids	2851-094	5.0	3			1	1	1/1
U	SOLID	Uranium, Isotopic in Soil	2851-094	5.0	3			1	1	1/1
Beta Counting										
SR	SOLID	Total Strontium in Soil	2851-094	10.0	3			1	1	1/1
Gamma Spectroscopy										
GAM	SOLID	Gamma Scan	2851-094	15.0	3			1	1	1/1
Liquid Scintillation Counting										
NI_L	SOLID	Nickel 63 in Soil	2851-094	10.0	3			1	1	1/1

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

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-PBS
 Version 3.06
 Report date 07/29/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0460

SDG 7724
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0460

WORK SUMMARY

CLIENT SAMPLE ID	LAB SAMPLE ID									
LOCATION	MATRIX	COLLECTED	SUF-							
CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
BOVWX3		N907034-01	7724-001	AM		07/16/99	07/26/99	TAH	Americium 241 in Soil	
N. Effluent Pipelines	SOLID	07/06/99	7724-001	GAM		07/09/99	07/16/99	TAH	Gamma Scan	
B99-004-072	B99-004	07/08/99	7724-001	NI_L		07/15/99	07/26/99	TAH	Nickel 63 in Soil	
			7724-001	PU		07/13/99	07/16/99	TAH	Plutonium, Isotopic in Solids	
			7724-001	SR		07/13/99	07/16/99	TAH	Total Strontium in Soil	
			7724-001	U		07/14/99	07/16/99	TAH	Uranium, Isotopic in Soil	
BOVWX4		N907034-02	7724-002	AM		07/16/99	07/26/99	TAH	Americium 241 in Soil	
N. Effluent Pipelines	SOLID	07/06/99	7724-002	GAM		07/09/99	07/16/99	TAH	Gamma Scan	
B99-004-072	B99-004	07/08/99	7724-002	NI_L		07/16/99	07/26/99	TAH	Nickel 63 in Soil	
			7724-002	PU		07/13/99	07/16/99	TAH	Plutonium, Isotopic in Solids	
			7724-002	SR		07/13/99	07/16/99	TAH	Total Strontium in Soil	
			7724-002	U		07/14/99	07/16/99	TAH	Uranium, Isotopic in Soil	
BOVWX5		N907034-03	7724-003	AM		07/16/99	07/26/99	TAH	Americium 241 in Soil	
N. Effluent Pipelines	SOLID	07/06/99	7724-003	GAM		07/09/99	07/16/99	TAH	Gamma Scan	
B99-004-072	B99-004	07/08/99	7724-003	NI_L		07/16/99	07/26/99	TAH	Nickel 63 in Soil	
			7724-003	PU		07/13/99	07/16/99	TAH	Plutonium, Isotopic in Solids	
			7724-003	SR		07/13/99	07/16/99	TAH	Total Strontium in Soil	
			7724-003	U		07/14/99	07/16/99	TAH	Uranium, Isotopic in Soil	
Method Blank		N907034-05	7724-005	AM		07/16/99	07/26/99	TAH	Americium 241 in Soil	
	SOLID		7724-005	GAM		07/09/99	07/16/99	TAH	Gamma Scan	
	B99-004		7724-005	NI_L		07/16/99	07/26/99	TAH	Nickel 63 in Soil	
			7724-005	PU		07/15/99	07/16/99	TAH	Plutonium, Isotopic in Solids	
			7724-005	SR		07/13/99	07/16/99	TAH	Total Strontium in Soil	
			7724-005	U		07/14/99	07/16/99	TAH	Uranium, Isotopic in Soil	
Lab Control Sample		N907034-04	7724-004	AM		07/16/99	07/26/99	TAH	Americium 241 in Soil	
	SOLID		7724-004	GAM		07/09/99	07/16/99	TAH	Gamma Scan	
	B99-004		7724-004	NI_L		07/16/99	07/26/99	TAH	Nickel 63 in Soil	
			7724-004	PU		07/13/99	07/16/99	TAH	Plutonium, Isotopic in Solids	
			7724-004	SR		07/13/99	07/16/99	TAH	Total Strontium in Soil	
			7724-004	U		07/14/99	07/16/99	TAH	Uranium, Isotopic in Soil	

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0460

SDG 7724
 Contact L.A. Johnson

WORK SUMMARY, cont.

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0460

CLIENT SAMPLE ID	LAB SAMPLE ID	LOCATION	MATRIX	COLLECTED	SUF-	CUSTODY	SAF No	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (N907034-01)	N907034-06			7724-006	AM						07/16/99	07/26/99	TAH		Americium 241 in Soil
N. Effluent Pipelines			SOLID	7724-006	GAM			07/06/99			07/09/99	07/16/99	TAH		Gamma Scan
			B99-004	7724-006	NI_L			07/08/99			07/16/99	07/26/99	TAH		Nickel 63 in Soil
				7724-006	PU						07/13/99	07/16/99	TAH		Plutonium, Isotopic in Solids
				7724-006	SR						07/13/99	07/16/99	TAH		Total Strontium in Soil
				7724-006	U						07/14/99	07/16/99	TAH		Uranium, Isotopic in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AM	B99-004	Americium 241 in Soil	AM/CMPLATE	3			1	1	1		6
GAM	B99-004	Gamma Scan	GAMMAHI	3			1	1	1		6
NI_L	B99-004	Nickel 63 in Soil	NI63LSC	3			1	1	1		6
PU	B99-004	Plutonium, Isotopic in Solids	PUPLATE	3			1	1	1		6
SR	B99-004	Total Strontium in Soil		3			1	1	1		6
U	B99-004	Uranium, Isotopic in Soil	UPLATE	3			1	1	1		6
TOTALS				18			6	6	6		36

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0460

N907034-05

Method Blank

METHOD BLANK

SDG <u>7724</u>	Client/Case no <u>Hanford</u>	SDG-H0460
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N907034-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7724-005</u>	Material/Matrix _____	<u>SOLID</u>
	SAF No <u>B99-004</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	0.044	0.17	1.0	U	U
Uranium 235	15117-96-1	0	0.053	0.20	1.0	U	U
Uranium 238	U-238	0	0.044	0.17	1.0	U	U
Plutonium 238	13981-16-3	0.314	0.38	0.60	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.13	0.48	1.0	U	PU
Nickel 63	13981-37-8	0.348	1.2	2.0	30	U	NI_L
Americium 241	14596-10-2	-0.007	0.020	0.048	1.0	U	AM
Total Strontium	SR-RAD	0.248	1.1	<u>1.9</u>	1.0	U	SR
Cobalt 60	10198-40-0	U		0.026	0.050	U	GAM
Cesium 134	13967-70-9	U		0.021		U	GAM
Cesium 137	10045-97-3	U		0.017	0.10	U	GAM
Europium 152	14683-23-9	U		0.043	0.10	U	GAM
Europium 154	15585-10-1	U		0.061	0.10	U	GAM
Europium 155	14391-16-3	U		0.027	0.10	U	GAM
Radium 226	13982-63-3	U		0.039	0.10	U	GAM
Americium 241	14596-10-2	U		0.014		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Uranium 235	15117-96-1	U		0.049		U	GAM

100 D Areas - Quick Turn

QC-BLANK 31243

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 07/29/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0460

N907034-04

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7724</u> Contact <u>L.A. Johnson</u> Lab sample id <u>N907034-04</u> Dept sample id <u>7724-004</u>	Client/Case no <u>Hanford</u> <u>SDG-H0460</u> Case no <u>TRB-SBB-207925</u> Client sample id <u>Lab Control Sample</u> Material/Matrix <u>SOLID</u> SAF No <u>B99-004</u>
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ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Uranium 233/234	8.43	1.2	0.60	1.0	U	8.92	0.36	95	78-122	80-120
Uranium 235	6.86	1.0	0.19	1.0	U	7.24	0.29	95	77-123	80-120
Uranium 238	8.87	1.2	0.57	1.0	U	9.66	0.39	92	79-121	80-120
Plutonium 238	52.7	4.6	0.60	1.0	PU	50.2	2.0	105	83-117	80-120
Plutonium 239/240	64.3	5.3	0.48	1.0	PU	66.1	2.6	97	85-115	80-120
Nickel 63	132	5.5	4.6	30	NI_L	134	5.4	99	83-117	
Americium 241	11.2	0.72	0.047	1.0	AM	11.5	0.46	97	87-113	80-120
Total Strontium	116	4.9	<u>1.8</u>	1.0	SR	102	4.1	114	81-119	
Cobalt 60	0.292	0.017	0.007	0.050	GAM	0.303	0.012	96	76-124	80-120
Cesium 137	0.309	0.016	0.011	0.10	GAM	0.303	0.012	102	75-125	80-120

100 D Areas - Quick Turn

QC-LCS 31242

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-LCS
 Version 3.06
 Report date 07/29/99

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0460

N907034-06

BOVWX3

DUPLICATE

SDG <u>7724</u>	Client/Case no <u>Hanford</u>	SDG-H0460
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N907034-06</u>	Lab sample id <u>N907034-01</u>	Client sample id <u>BOVWX3</u>
Dept sample id <u>7724-006</u>	Dept sample id <u>7724-001</u>	Location/Matrix <u>N. Effluent Pipelines</u> <u>SOLID</u>
	Received <u>07/08/99</u>	Collected <u>07/06/99 10:20</u>
% solids <u>95.6</u>	% solids <u>95.6</u>	Custody/SAF No <u>B99-004-072</u> <u>B99-004</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	
Uranium 233/234	0.513	0.23	0.22	1.0	J	U	0.366	0.21	0.20	J	33	107
Uranium 235	0.069	0.069	0.26	1.0	U	U	0	0.063	0.24	U	-	
Uranium 238	0.541	0.24	0.22	1.0	J	U	0.261	0.16	0.20	J	70	108
Plutonium 238	0.190	0.25	0.48	1.0	U	PU	-0.064	0.13	0.49	U	-	
Plutonium 239/240	0	0.13	0.48	1.0	U	PU	0	0.13	0.49	U	-	
Nickel 63	23.9	2.0	2.3	30	J	NI_L	23.9	2.4	3.0	J	0	29
Americium 241	0.004	0.040	0.068	1.0	U	AM	0.013	0.053	0.096	U	-	
Total Strontium	0.042	1.0	<u>1.9</u>	1.0	U	SR	0.579	1.1	<u>2.0</u>	U	-	
Potassium 40	10.2	0.52	0.22			GAM	9.77	0.84	0.42		4	35
Cobalt 60	0.878	0.056	0.035	0.050		GAM	0.774	0.082	<u>0.065</u>		13	37
Cesium 134	U		0.054		U	GAM	U		0.086	U	-	
Cesium 137	6.64	0.11	0.061	0.10		GAM	6.33	0.16	0.10		5	32
Europium 152	4.85	0.13	<u>0.12</u>	0.10		GAM	5.18	0.22	<u>0.20</u>		7	33
Europium 154	0.571	0.12	<u>0.12</u>	0.10		GAM	0.599	0.19	<u>0.21</u>		5	66
Europium 155	U		<u>0.12</u>	0.10	U	GAM	U		<u>0.21</u>	U	-	
Radium 226	0.364	0.074	0.085	0.10		GAM	0.350	0.087	<u>0.12</u>		4	58
Radium 228	0.449	0.16	0.19	0.20		GAM	0.592	0.26	<u>0.33</u>		27	94
Thorium 228	0.473	0.045	0.062			GAM	0.432	0.070	0.099		9	42
Thorium 232	0.449	0.16	0.19			GAM	0.592	0.26	0.33		27	94
Americium 241	U		0.12		U	GAM	U		0.26	U	-	
Uranium 238	U		6.0		U	GAM	U		8.6	U	-	
Uranium 235	U		0.16		U	GAM	U		0.28	U	-	

100 D Areas - Quick Turn

QC-DUP#1 31244

Lab id TMANC
Protocol Hanford
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0460

N907034-01

B0VWX3

DATA SHEET

SDG <u>7724</u>	Client/Case no <u>Hanford</u>	SDG-H0460
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N907034-01</u>	Client sample id <u>B0VWX3</u>	
Dept sample id <u>7724-001</u>	Location/Matrix <u>N. Effluent Pipelines</u>	<u>SOLID</u>
Received <u>07/08/99</u>	Collected <u>07/06/99 10:20</u>	
% solids <u>95.6</u>	Custody/SAF No <u>B99-004-072</u>	<u>B99-004</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	0.366	0.21	0.20	1.0	J	U
Uranium 235	15117-96-1	0	0.063	0.24	1.0	U	U
Uranium 238	U-238	0.261	0.16	0.20	1.0	J	U
Plutonium 238	13981-16-3	-0.064	0.13	0.49	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.13	0.49	1.0	U	PU
Nickel 63	13981-37-8	23.9	2.4	3.0	30	J	NI_L
Americium 241	14596-10-2	0.013	0.053	0.096	1.0	U	AM
Total Strontium	SR-RAD	0.579	1.1	<u>2.0</u>	1.0	U	SR
Potassium 40	13966-00-2	9.77	0.84	0.42			GAM
Cobalt 60	10198-40-0	0.774	0.082	<u>0.065</u>	0.050		GAM
Cesium 134	13967-70-9	U		0.086		U	GAM
Cesium 137	10045-97-3	6.33	0.16	0.10	0.10		GAM
Europium 152	14683-23-9	5.18	0.22	<u>0.20</u>	0.10		GAM
Europium 154	15585-10-1	0.599	0.19	<u>0.21</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>0.21</u>	0.10	U	GAM
Radium 226	13982-63-3	0.350	0.087	<u>0.12</u>	0.10		GAM
Radium 228	15262-20-1	0.592	0.26	<u>0.33</u>	0.20		GAM
Thorium 228	14274-82-9	0.432	0.070	0.099			GAM
Thorium 232	TH-232	0.592	0.26	0.33			GAM
Americium 241	14596-10-2	U		0.26		U	GAM
Uranium 238	U-238	U		8.6		U	GAM
Uranium 235	15117-96-1	U		0.28		U	GAM

100 D Areas - Quick Turn

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0460

N907034-02

BOVWX4

DATA SHEET

SDG <u>7724</u>	Client/Case no <u>Hanford</u>	SDG-H0460
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N907034-02</u>	Client sample id <u>BOVWX4</u>	
Dept sample id <u>7724-002</u>	Location/Matrix <u>N. Effluent Pipelines</u>	<u>SOLID</u>
Received <u>07/08/99</u>	Collected <u>07/06/99 09:15</u>	
% solids <u>96.8</u>	Custody/SAF No <u>B99-004-072</u>	<u>B99-004</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	0.667	0.26	0.19	1.0	J	U
Uranium 235	15117-96-1	0.090	0.12	0.23	1.0	U	U
Uranium 238	U-238	0.618	0.26	0.19	1.0	J	U
Plutonium 238	13981-16-3	-0.064	0.26	0.62	1.0	U	PU
Plutonium 239/240	PU-239/240	0.064	0.13	0.49	1.0	U	PU
Nickel 63	13981-37-8	2.22	2.0	3.2	30	U	NI_L
Americium 241	14596-10-2	0.013	0.067	0.12	1.0	U	AM
Total Strontium	SR-RAD	-0.311	0.99	<u>1.9</u>	1.0	U	SR
Potassium 40	13966-00-2	9.78	0.48	0.17			GAM
Cobalt 60	10198-40-0	U		0.023	0.050	U	GAM
Cesium 134	13967-70-9	U		0.039		U	GAM
Cesium 137	10045-97-3	0.068	0.018	0.020	0.10	J	GAM
Europium 152	14683-23-9	0.155	0.046	0.057	0.10		GAM
Europium 154	15585-10-1	U		0.079	0.10	U	GAM
Europium 155	14391-16-3	U		0.065	0.10	U	GAM
Radium 226	13982-63-3	0.364	0.046	0.045	0.10		GAM
Radium 228	15262-20-1	0.533	0.12	0.12	0.20		GAM
Thorium 228	14274-82-9	0.532	0.030	0.028			GAM
Thorium 232	TH-232	0.533	0.12	0.12			GAM
Americium 241	14596-10-2	U		0.072		U	GAM
Uranium 238	U-238	U		2.6		U	GAM
Uranium 235	15117-96-1	U		0.094		U	GAM

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0460

N907034-03

B0VWX5

DATA SHEET

SDG <u>7724</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0460</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N907034-03</u>	Client sample id <u>B0VWX5</u>	
Dept sample id <u>7724-003</u>	Location/Matrix <u>N. Effluent Pipelines</u>	<u>SOLID</u>
Received <u>07/08/99</u>	Collected <u>07/06/99 09:30</u>	
% solids <u>96.8</u>	Custody/SAF No <u>B99-004-072</u>	<u>B99-004</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	0.371	0.23	0.22	1.0	J	U
Uranium 235	15117-96-1	0	0.069	0.26	1.0	U	U
Uranium 238	U-238	0.400	0.23	0.22	1.0	J	U
Plutonium 238	13981-16-3	0.187	0.37	0.69	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.12	0.48	1.0	U	PU
Nickel 63	13981-37-8	0.578	1.5	2.5	30	U	NI_L
Americium 241	14596-10-2	-0.015	0.074	0.14	1.0	U	AM
Total Strontium	SR-RAD	-0.070	1.0	<u>1.9</u>	1.0	U	SR
Potassium 40	13966-00-2	10.2	0.57	0.28			GAM
Cobalt 60	10198-40-0	U		0.028	0.050	U	GAM
Cesium 134	13967-70-9	U		0.033		U	GAM
Cesium 137	10045-97-3	0.048	0.029	0.031	0.10	J	GAM
Europium 152	14683-23-9	U		0.064	0.10	U	GAM
Europium 154	15585-10-1	U		0.10	0.10	U	GAM
Europium 155	14391-16-3	U		0.051	0.10	U	GAM
Radium 226	13982-63-3	0.380	0.055	0.051	0.10		GAM
Radium 228	15262-20-1	0.540	0.13	0.13	0.20		GAM
Thorium 228	14274-82-9	0.519	0.030	0.028			GAM
Thorium 232	TH-232	0.540	0.13	0.13			GAM
Americium 241	14596-10-2	U		0.038		U	GAM
Uranium 238	U-238	U		3.5		U	GAM
Uranium 235	15117-96-1	U		0.16		U	GAM

100 D Areas - Quick Turn

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Version <u>3.06</u>
Report date <u>07/29/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0460

Test AM Matrix SOLID
 SDG 7724
 Contact L.A. Johnson

METHOD SUMMARY

AMERICIUM 241 IN SOIL
 ALPHA SPECTROSCOPY

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0460

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Americium 241
Preparation batch 2851-094					
B0VWX3	N907034-01	7724-001			U
B0VWX4	N907034-02	7724-002			U
B0VWX5	N907034-03	7724-003			U
BLK (QC ID=31243)	N907034-05	7724-005			U
LCS (QC ID=31242)	N907034-04	7724-004			ok
Duplicate (N907034-01)	N907034-06	7724-006			- U

Nominal values and limits from method RDLs (pCi/g) 1.0
 100 D 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 %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 2851-094 2σ prep error 5.0 % Reference lab Notebook #2785 pg. 094																
B0VWX3	N907034-01			0.096	0.500			49		723			10	07/16/99	07/16	SS-035
B0VWX4	N907034-02			0.12	0.500			50		723			10	07/16/99	07/16	SS-036
B0VWX5	N907034-03			0.14	0.500			46		723			10	07/16/99	07/16	SS-038
BLK (QC ID=31243)	N907034-05			0.048	0.500			99		712				07/16/99	07/16	SS-050
LCS (QC ID=31242)	N907034-04			0.047	0.500			100		714				07/16/99	07/16	SS-044
Duplicate (N907034-01)	N907034-06			0.068	0.500			81		712			10	07/16/99	07/16	SS-047
	(QC ID=31244)															

Nominal values and limits from method 1.0 0.500 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>0.086</u> ± <u>0.077</u>
FOR 6 SAMPLES	YIELD <u>71</u> ± <u>51</u>

METHOD SUMMARIES

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0460

Test PU Matrix SOLID
 SDG 7724
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0460

METHOD SUMMARY
 PLUTONIUM, ISOTOPIC IN SOLIDS
 ALPHA SPECTROSCOPY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUP- TEST FIX	SUP- PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 2851-094					
B0VWX3	N907034-01	7724-001		U	U
B0VWX4	N907034-02	7724-002		U	U
B0VWX5	N907034-03	7724-003		U	U
BLK (QC ID=31243)	N907034-05	7724-005		U	U
LCS (QC ID=31242)	N907034-04	7724-004		ok	ok
Duplicate (N907034-01)	N907034-06	7724-006		- U	- U

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

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	PWHM keV	DRIFT Kev	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 2851-094 2σ prep error 5.0 % Reference Lab Notebook #2785 pg. 094														
B0VWX3	N907034-01		0.49	0.100			89	201			7	07/12/99	07/13	SS-031
B0VWX4	N907034-02		0.62	0.100			88	201			7	07/12/99	07/13	SS-032
B0VWX5	N907034-03		0.69	0.100			93	201			7	07/12/99	07/13	SS-033
BLK (QC ID=31243)	N907034-05		0.60	0.100			87	209				07/12/99	07/15	SS-032
LCS (QC ID=31242)	N907034-04		0.60	0.100			92	201				07/12/99	07/13	SS-034
Duplicate (N907034-01)	N907034-06		0.48	0.100			91	200			7	07/12/99	07/13	SS-045
	(QC ID=31244)													

Nominal values and limits from method 1.0 0.100 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>0.58</u>	±	<u>0.16</u>
FOR 6 SAMPLES	YIELD	<u>90</u>	±	<u>5</u>

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TMA/RICHMOND
SAMPLE DELIVERY GROUP H0460

METHOD SUMMARY
URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Test U Matrix SOLID
SDG 7724
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0460

RESULTS

CLIENT SAMPLE ID	LAB	RAW	SUF-	1: Uranium			2: Uranium			3: Uranium			RESULT RATIOS (%)			
	SAMPLE ID	TEST	FIX	PLANCHET	233/234	235	238	233/234	235	238	1+3	2σ	2+3	2σ		
Preparation batch 2851-094																
BOVWX3	N907034-01	7724-001			0.366 J	U		0.261 J			140	118	0	24		
BOVWX4	N907034-02	7724-002			0.667 J	U		0.618 J			108	62	15	20		
BOVWX5	N907034-03	7724-003			0.371 J	U		0.400 J			93	78	0	17		
BLK (QC ID=31243)	N907034-05	7724-005			U	U		U								
LCS (QC ID=31242)	N907034-04	7724-004			ok	ok		ok								
Duplicate (N907034-01)	N907034-06	7724-006			ok J	-	U	ok J			95	60	13	14		
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0				100			4		
100 D Areas - Quick Turn											Averages 109			7		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB	RAW	SUF-	MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
	SAMPLE ID	TEST	FIX	pCi/g	g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZBD	DETECTOR
Preparation batch 2851-094 2σ prep error 5.0 % Reference Lab Notebook #2785 pg. 094																
BOVWX3	N907034-01			0.24	0.500			82			107		8	07/14/99	07/14	SS-031
BOVWX4	N907034-02			0.23	0.500			87			107		8	07/14/99	07/14	SS-032
BOVWX5	N907034-03			0.26	0.500			77			107		8	07/14/99	07/14	SS-033
BLK (QC ID=31243)	N907034-05			0.20	0.500			100			107			07/14/99	07/14	SS-035
LCS (QC ID=31242)	N907034-04			0.60	0.500			104			107			07/14/99	07/14	SS-034
Duplicate (N907034-01)	N907034-06			0.26	0.500			78			107		8	07/14/99	07/14	SS-036
(QC ID=31244)																
Nominal values and limits from method				1.0	0.500			30-105			150	100		180		

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

AVERAGES ± 2 SD	MDA	0.30 ± 0.30
FOR 6 SAMPLES	YIELD	88 ± 23

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TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0460

METHOD SUMMARY
 TOTAL STRONTIUM IN SOIL
 BETA COUNTING

Test SR Matrix SOLID
 SDG 7724
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0460

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Total Strontium
Preparation batch 2851-094.				
BOVWX3	N907034-01		7724-001	U
BOVWX4	N907034-02		7724-002	U
BOVWX5	N907034-03		7724-003	U
BLK (QC ID=31243)	N907034-05		7724-005	U
LCS (QC ID=31242)	N907034-04		7724-004	ok
Duplicate (N907034-01)	N907034-06		7724-006	- U

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

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MAX MDA	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 2851-094 2σ prep error 10.0 % Reference Lab Notebook #2785 pg. 094															
BOVWX3	N907034-01		<u>2.0</u>	0.100				84		150			7	07/12/99	07/13 GRB-217
BOVWX4	N907034-02		<u>1.9</u>	0.100				86		150			7	07/12/99	07/13 GRB-218
BOVWX5	N907034-03		<u>1.9</u>	0.100				89		150			7	07/12/99	07/13 GRB-219
BLK (QC ID=31243)	N907034-05		<u>1.9</u>	0.100				89		150				07/12/99	07/13 GRB-202
LCS (QC ID=31242)	N907034-04		<u>1.8</u>	0.100				90		150				07/12/99	07/13 GRB-220
Duplicate (N907034-01)	N907034-06		<u>1.9</u>	0.100				87		150			7	07/12/99	07/13 GRB-203
	(QC ID=31244)														

Nominal values and limits from method 1.0 0.100 100 180

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

AVERAGES ± 2 SD MDA 1.9 ± 0.13
 FOR 6 SAMPLES YIELD 88 ± 5

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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0460

METHOD SUMMARY

NICKEL 63 IN SOIL

LIQUID SCINTILLATION COUNTING

Test NI L Matrix SOLID
 SDG 7724
 Contact L.A. Johnson

Client Hanford
 Contract TRB-SBB-207925
 Case no SDG-H0460

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Nickel 63
Preparation batch 2851-094				
BOVWX3	N907034-01	7724-001	23.9	J
BOVWX4	N907034-02	7724-002	U	
BOVWX5	N907034-03	7724-003	U	
BLK (QC ID=31243)	N907034-05	7724-005	U	
LCS (QC ID=31242)	N907034-04	7724-004	ok	
Duplicate (N907034-01)	N907034-06	7724-006	ok	J

Nominal values and limits from method RDLs (pCi/g) 30
 100 D Areas - Quick Turn

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- pCi/g	MDA g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EPF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- YZED	DETECTOR
Preparation batch 2851-094 2σ prep error 10.0 % Reference Lab Notebook #2785 pg. 094															
BOVWX3	N907034-01		3.0	0.500				67	100			9	07/13/99	07/15	LSC-004
BOVWX4	N907034-02		3.2	0.500				60	100			10	07/13/99	07/16	LSC-004
BOVWX5	N907034-03		2.5	0.500				77	100			10	07/13/99	07/16	LSC-004
BLK (QC ID=31243)	N907034-05		2.0	0.500				95	100				07/13/99	07/16	LSC-004
LCS (QC ID=31242)	N907034-04		4.6	0.500				44	100				07/13/99	07/16	LSC-004
Duplicate (N907034-01)	N907034-06		2.3	0.500				84	100			10	07/13/99	07/16	LSC-004
	(QC ID=31244)														

Nominal values and limits from method 30 0.500 10 180

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

AVERAGES ± 2 SD MDA 2.9 ± 1.9
 FOR 6 SAMPLES YIELD 71 ± 36

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REPORT GUIDE

Client Hanford
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SAMPLE SUMMARY

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

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

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
 - * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
 - * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
 - * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.
- QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.
- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

REPORT GUIDES

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Client Hanford
Contract TRB-SBB-207925
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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.

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REPORT GUIDE

Client Hanford
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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.

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DATA SHEET

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

The following notes apply to this report:

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

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

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

The following qualifiers are defined by the DVD system:

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

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DATA SHEET

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

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

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

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

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

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

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

P The RESULT is 'preliminary'.

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

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

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

The following values are underlined to indicate possible problems:

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

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GUIDE, cont.

Client Hanford
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DATA SHEET

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

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REPORT GUIDE

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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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SAMPLE DELIVERY GROUP H0460

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REPORT GUIDE

Client Hanford
Contract TRB-SBE-207925
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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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DUPLICATE

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

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

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

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

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Version 3.06
Report date 07/29/99

SDG 7724
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0460

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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MATRIX SPIKE

for the recovery.

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

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

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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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Collector RB Kerkow	Company Contact RB Kerkow	Telephone No. 509-531-0635	Project Coordinator TRENT, SJ	Price Code	Data Turnaround
Project Designation 100 D Areas - Quick Turn	Sampling Location N. Effluent Pipelines	SAF No. B99-004	7 days		
Ice Chest No.	Field Logbook No. EL-1339-5	Method of Shipment FED Ex			
Shipped To TMA/RBORA REF 7-7-99	Offsite Property No.	Bill of Lading/Air Bill No. COA R100DC 2FOO			

POSSIBLE SAMPLE HAZARDS/REMARKS PCBs, Radioactive	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None				
	Type of Container	aG	aG	aG	aG	aG	P				
	No. of Container(s)	1	1	1	1	1	1				
Special Handling and/or Storage	Volume	60mL	60mL	60mL	60mL	60mL	750mL				

SAMPLE ANALYSIS				Chromium Hex - 7196	PCBs - 8080	See item (1) in Special Instructions.	VOA - 8260A (TCL)	See item (2) in Special Instructions.	See item (3) in Special Instructions.			
Sample No.	Matrix *	Sample Date	Sample Time									
✓ B0VWX3	Soil	7/6/99	1020						X			TIE TO B0VTD8
✓ B0VWX4	Soil	7/6/99	0915						X			TIE TO B0VTD9
✓ B0VWX5	Soil	7/6/99	0930						X			TIE TO B0VTF0

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By RB Kerkow Date/Time 7/6/99 1630	Received By REF IC Date/Time 7/6/99 1630	(1) Semi-VOA - 8270 Complete (Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Benzoic acid, Bis(2-ethylhexyl) phthalate, Butylbenzylphthalate, Chrysene, Di-n-butylphthalate, Fluoranthene, Indeno(1,2,3-cd)pyr (2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Silver); Mercury - 7471 - (CV) (3) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238); Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); Isotopic Plutonium; Americium-241; Nickel-63; Strontium-8	Soil Water Vapor Other Solid Other Liquid
Relinquished By RB Kerkow Date/Time 7-7-99 0800	Received By REF IC Date/Time 7-7-99 0800		
Relinquished By REF IC Date/Time 7-7-99 1320	Received By REF IC Date/Time 7-7-99 1320		
Relinquished By REF IC Date/Time 7-8-99 9:15	Received By REF IC Date/Time 7-8-99 9:15		
LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT			
Client: <u>Beehtel, Hanford</u>	Date/Time received <u>7-8-99 9:15</u>		
CoC No. <u>B99-004-072</u>			
Container I.D. No. <u>3-5gal Drum</u>		Requested TAT (Days) <u>7</u>	P.O. Received Yes [] No [<input checked="" type="checkbox"/>]
INSPECTION			
1.	Custody seals on shipping container intact?	Yes [<input checked="" type="checkbox"/>]	No [] N/A []
2.	Custody seals on shipping container dated & signed?	Yes [<input checked="" type="checkbox"/>]	No [] N/A []
3.	Custody seals on sample containers intact?	Yes [<input checked="" type="checkbox"/>]	No [] N/A []
4.	Custody seals on sample containers dated & signed?	Yes [<input checked="" type="checkbox"/>]	No [] N/A []
5.	Cooler Temperature: _____	Packing material is:	Wet [] Dry [<input checked="" type="checkbox"/>]
6.	Number of samples in shipping container: <u>3</u>		
7.	Number of containers per sample: <u>1</u> (Or see CoC _____)		
8.	Paperwork agrees with samples?	Yes [<input checked="" type="checkbox"/>]	No []
9.	Samples have: Tape [<input checked="" type="checkbox"/>] Hazard labels [] Rad labels [<input checked="" type="checkbox"/>] Appropriate sample labels [<input checked="" type="checkbox"/>]		
10.	Samples are: In good condition [<input checked="" type="checkbox"/>] Leaking [] Broken Container [] Missing []		
11.	Describe any anomalies: _____ _____ _____		
13.	Was P.M. notified of any anomalies? Yes [<input checked="" type="checkbox"/>] No []		Date <u>7-8-99</u>
14.	Received by <u>J.P. Corcoran</u>		Date: <u>7-8-99</u> Time: <u>9:15</u>
LOGIN			
TNU W.O. No. _____	Group No. _____	Client W.O. No. _____	
PROGRAM MANAGER			
Sample holding times exceeded?		Yes []	No []
Client Notified: Name _____		Date/time _____	

SHIPPING INST.	SHIP TO: <u>THE RADIOTECH</u> Company		HAZARDOUS MATERIAL SHIPMENT RECORD (HMSR)		99188-3
	<u>2030 Wright Ave</u> Address		Originating Facility	Originator Signature	Date
	<u>Richmond, Ca 94804-0040</u> City, State, Zip		Building <u>3228</u> Area <u>300</u>	<u>Robert F. ...</u>	<u>7-7-99</u>
	<u>Larry Johnson 235-2633</u> Attention:		FROM: <input type="checkbox"/> WHC <input type="checkbox"/> KEH <input type="checkbox"/> PNL <input checked="" type="checkbox"/> OTHER <u>B/H</u>		
		OFFSITE ONLY:	SHIP: <input checked="" type="checkbox"/> PREPAID <input type="checkbox"/> COLLECT		
		VIA: <input type="checkbox"/> Parcel Post <input type="checkbox"/> Air (Passenger)	<input type="checkbox"/> Air Parcel Post <input type="checkbox"/> Air (Cargo)	Freight (Rail/Truck) <input type="checkbox"/>	
				Cost Code: <u>TR00DC 2F00</u>	

CONTAINERS/PACKAGING						CONTENT DESCRIPTION
Number of Containers	Type	DOT Spec	Package Dimensions	Quantity Pkg	Gross Wt Each Pkg	See 49 CFR 172.101(c) Hazardous Material Table
3	metal inner can, steel outer drum	IP3 inner, 1A2 outer	11" Dia inner, 14" HT. Sgal	3 1 Ea 1 Liter 3 (total)	6 kg	Proper Ship Name: <u>Polychlorinated Biphenyls, solid mixture</u> Hazard Class: <u>9 PG II</u> UN/NA No.: <u>UN 2315</u> List Secondary Hazards: <u>None</u> List Labels Req'd/Applied: <u>CLASS 9</u>
						Proper Ship Name: Hazard Class: UN/NA No.: List Secondary Hazards: List Labels Req'd/Applied
			Sample Nos: <u>B30VWX3, B30VWX4, B30VWX5</u>			Proper Ship Name: <u>Note: Packaged Per IATA FX-06</u> Hazard Class: UN/NA No.: List Secondary Hazards: <u>Package Inst. 911</u> List Labels Req'd/Applied
			Emergency Response No: <u>1 888 766 0771</u>			
			ERG No: <u>171</u>			

Total No. Containers	Gross Wt of Shipment	Identify Placards Required:	Identify Property Control or Return Order No. (if applicable)
3	18 kg	1. <u>NA</u> 3. <u>---</u> 2. <u>---</u> 4. <u>---</u>	

Material in manufacturers original container: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Describe Internal Packaging: <u>Poly bottles, double bagged packed in vermiculite in IP3 IP3 packed in vermiculite in 1A2</u>
Container free of deterioration or damage: <input checked="" type="checkbox"/> Yes	
Container acceptability documented: <input checked="" type="checkbox"/> Yes	
Material is packaged, sealed, marked and labelled to meet DOT requirements <input checked="" type="checkbox"/> Yes	

RADIATION RELEASE	Survey No.	Date	RM Signature	Print Name
			<u>See attached activity report</u>	

CERTIFICATION	
CONTRACTORS CERTIFICATION	This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transport according to the applicable regulations of the Department of Transportation: This shipment is within the Limitations prescribed for: <input type="checkbox"/> Passenger Aircraft <input type="checkbox"/> Cargo Aircraft <input type="checkbox"/> NA Aircraft
Authorizing Signature: <u>[Signature]</u>	Print Name: <u>Kathy R. Smith</u> Date: <u>7-7-99</u>

FOR OFFSITE SHIPMENTS - ADDITIONAL APPROVAL REQUIRED						
WHC	TRAFFIC	B.L. No.	Date Shipped	ETA	Routing	Special Considerations
			<u>7-7-99</u>	<u>7-8-99</u>	<u>FedEx</u>	
		WHC Traffic: <u>[Signature]</u>	WHC Shipping: <u>[Signature]</u>			