RECRA LabNet

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Virtual Laboratories Everywhere

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OCT 1998 RECEIVED Data Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B98-087
RFW# : 9808L242
SDG/SAF# : H0187/B98-087

W.O.# : 10985-001-001-9999-00
Date Received: 08-07-98

DEC 1998 RECEIVED EDMC

METALS CASE NARRATIVE

1. This narrative covers the analyses of 5 solid samples.

2. 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 control limits.

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

7. All preparation/method blanks were within method criteria. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recoveries for 8 analytes and matrix spike duplicate (MSD) recoveries for 6 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 24 pages.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
BONVP3	Silver	1000	94.5
	Aluminum	20,000	85.9
	Calcium	20,000	45.0
	Copper	1000	89.1
	Iron	20,000	70.0
	Lead	1000	91.2
	Antimony	1000	97.5
	Zinc	1000	88.7

12. The MSs and MSDs for 7 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Matrix Spike Duplicate Report.

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

14. 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.

for Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

9-29-98
Date

mld/m08-242

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9808L242

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

Metals Digestion Methods: __3005A __3010A __3015 __3020A ✓3050A __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

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

Other:_____ **Method:**_____

L-WI-033/M-03/98

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

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

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

4. Flame AA.

5. Graphite Furnace AA.

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INORGANICS DATA SUMMARY REPORT 09/29/98

CLIENT: TNU-HANFORD B98-087 RECRA LOT #: 9808L242

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BONVP3	Silver, Total	9.6	MG/KG	0.57	1.0
		Aluminum, Total	8420	MG/KG	3.3	1.0
		Arsenic, Total	43.4	MG/KG	4.7	1.0
		Barium, Total	113	MG/KG	0.41	1.0
		Beryllium, Total	0.26	MG/KG	0.02	1.0
		Calcium, Total	86700	MG/KG	1.7	1.0
		Cadmium, Total	0.49 u	MG/KG	0.49	1.0
		Cobalt, Total	15.1	MG/KG	0.72	1.0
		Chromium, Total	9.3	MG/KG	0.69	1.0
		Copper, Total	43.2	MG/KG	0.30	1.0
		Iron, Total	18400	MG/KG	0.28	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1230	MG/KG	74.8	1.0
		Magnesium, Total	4170	MG/KG	4.7	1.0
		Manganese, Total	250	MG/KG	0.15	1.0
		Sodium, Total	903	MG/KG	4.8	1.0
		Nickel, Total	8.9	MG/KG	1.2	1.0
		Lead, Total	26.2	MG/KG	4.6	1.0
		Antimony, Total	22.1	MG/KG	3.2	1.0
		Selenium, Total	5.4 u	MG/KG	5.4	1.0
		Thallium, Total	6.2 u	MG/KG	6.2	1.0
		Vanadium, Total	48.0	MG/KG	0.43	1.0
		Zinc, Total	134	MG/KG	0.20	1.0

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SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	BONVP4	Silver, Total	11.9	MG/KG	0.53	1.0
		Aluminum, Total	7980	MG/KG	3.1	1.0
		Arsenic, Total	39.4	MG/KG	4.4	1.0
		Barium, Total	105	MG/KG	0.38	1.0
		Beryllium, Total	0.26	MG/KG	0.02	1.0
		Calcium, Total	81900	MG/KG	1.6	1.0
		Cadmium, Total	0.46 u	MG/KG	0.46	1.0
		Cobalt, Total	14.2	MG/KG	0.67	1.0
		Chromium, Total	9.0	MG/KG	0.64	1.0
		Copper, Total	40.7	MG/KG	0.28	1.0
		Iron, Total	19000	MG/KG	0.26	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1220	MG/KG	69.7	1.0
		Magnesium, Total	3980	MG/KG	4.4	1.0
		Manganese, Total	246	MG/KG	0.14	1.0
		Sodium, Total	896	MG/KG	4.4	1.0
		Nickel, Total	8.3	MG/KG	1.1	1.0
		Lead, Total	17.2	MG/KG	4.3	1.0
		Antimony, Total	19.5	MG/KG	3.0	1.0
		Selenium, Total	5.1 u	MG/KG	5.1	1.0
		Thallium, Total	5.8 u	MG/KG	5.8	1.0
		Vanadium, Total	55.4	MG/KG	0.40	1.0
		Zinc, Total	122	MG/KG	0.18	1.0

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SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	BONVP5	Silver, Total	0.53 u	MG/KG	0.53	1.0
		Aluminum, Total	9200	MG/KG	3.1	1.0
		Arsenic, Total	48.1	MG/KG	4.4	1.0
		Barium, Total	116	MG/KG	0.38	1.0
		Beryllium, Total	0.29	MG/KG	0.02	1.0
		Calcium, Total	98600	MG/KG	1.6	1.0
		Cadmium, Total	0.46 u	MG/KG	0.46	1.0
		Cobalt, Total	12.9	MG/KG	0.67	1.0
		Chromium, Total	10.3	MG/KG	0.65	1.0
		Copper, Total	35.3	MG/KG	0.28	1.0
		Iron, Total	19300	MG/KG	0.27	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1370	MG/KG	69.9	1.0
		Magnesium, Total	4460	MG/KG	4.4	1.0
		Manganese, Total	264	MG/KG	0.14	1.0
		Sodium, Total	1110	MG/KG	4.5	1.0
		Nickel, Total	8.3	MG/KG	1.1	1.0
		Lead, Total	17.8	MG/KG	4.3	1.0
		Antimony, Total	20.4	MG/KG	3.0	1.0
		Selenium, Total	5.1 u	MG/KG	5.1	1.0
		Thallium, Total	5.8 u	MG/KG	5.8	1.0
		Vanadium, Total	53.8	MG/KG	0.40	1.0
		Zinc, Total	126	MG/KG	0.18	1.0

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INORGANICS DATA SUMMARY REPORT 09/29/98

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SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	BONVP6	Silver, Total	21.1	MG/KG	0.58	1.0
		Aluminum, Total	8710	MG/KG	3.4	1.0
		Arsenic, Total	62.7	MG/KG	4.8	1.0
		Barium, Total	114	MG/KG	0.42	1.0
		Beryllium, Total	0.27	MG/KG	0.03	1.0
		Calcium, Total	96500	MG/KG	1.8	1.0
		Cadmium, Total	0.51 u	MG/KG	0.51	1.0
		Cobalt, Total	17.5	MG/KG	0.73	1.0
		Chromium, Total	10.6	MG/KG	0.71	1.0
		Copper, Total	55.7	MG/KG	0.30	1.0
		Iron, Total	19300	MG/KG	0.29	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1190	MG/KG	76.8	1.0
		Magnesium, Total	4220	MG/KG	4.9	1.0
		Manganese, Total	292	MG/KG	0.15	1.0
		Sodium, Total	926	MG/KG	4.9	1.0
		Nickel, Total	9.4	MG/KG	1.2	1.0
		Lead, Total	36.4	MG/KG	4.7	1.0
		Antimony, Total	27.6	MG/KG	3.3	1.0
		Selenium, Total	5.6 u	MG/KG	5.6	1.0
		Thallium, Total	6.4 u	MG/KG	6.4	1.0
		Vanadium, Total	53.9	MG/KG	0.44	1.0
		Zinc, Total	176	MG/KG	0.20	1.0

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INORGANICS DATA SUMMARY REPORT 09/29/98

CLIENT: TNU-HANFORD B98-087 RECRA LOT #: 9808L242

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	BOP2W8	Silver, Total	0.91	MG/KG	0.54	1.0
		Aluminum, Total	7830	MG/KG	3.1	1.0
		Arsenic, Total	50.6	MG/KG	4.5	1.0
		Barium, Total	98.2	MG/KG	0.39	1.0
		Beryllium, Total	0.25	MG/KG	0.02	1.0
		Calcium, Total	84700	MG/KG	1.7	1.0
		Cadmium, Total	0.47 u	MG/KG	0.47	1.0
		Cobalt, Total	13.0	MG/KG	0.68	1.0
		Chromium, Total	9.0	MG/KG	0.66	1.0
		Copper, Total	39.3	MG/KG	0.28	1.0
		Iron, Total	19000	MG/KG	0.27	1.0
		Mercury, Total	0.06	MG/KG	0.02	1.0
		Potassium, Total	1090	MG/KG	71.1	1.0
		Magnesium, Total	4110	MG/KG	4.5	1.0
		Manganese, Total	269	MG/KG	0.14	1.0
		Sodium, Total	744	MG/KG	4.5	1.0
		Nickel, Total	7.6	MG/KG	1.1	1.0
		Lead, Total	14.2	MG/KG	4.4	1.0
		Antimony, Total	13.1	MG/KG	3.0	1.0
		Selenium, Total	5.2 u	MG/KG	5.2	1.0
		Thallium, Total	5.9 u	MG/KG	5.9	1.0
		Vanadium, Total	50.9	MG/KG	0.41	1.0
		Zinc, Total	130	MG/KG	0.19	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/29/98

CLIENT: TNU-HANFORD B98-087 RECRA LOT #: 9808L242

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	98L1084-MB1	Silver, Total	0.46 u	MG/KG	0.46	1.0
		Aluminum, Total	2.7 u	MG/KG	2.7	1.0
		Arsenic, Total	3.8 u	MG/KG	3.8	1.0
		Barium, Total	0.33 u	MG/KG	0.33	1.0
		Beryllium, Total	0.02 u	MG/KG	0.02	1.0
		Calcium, Total	7.8	MG/KG	1.4	1.0
		Cadmium, Total	0.40 u	MG/KG	0.40	1.0
		Cobalt, Total	0.58 u	MG/KG	0.58	1.0
		Chromium, Total	0.56 u	MG/KG	0.56	1.0
		Copper, Total	0.24 u	MG/KG	0.24	1.0
		Iron, Total	0.57	MG/KG	0.23	1.0
		Potassium, Total	60.6 u	MG/KG	60.6	1.0
		Magnesium, Total	3.8 u	MG/KG	3.8	1.0
		Manganese, Total	0.12 u	MG/KG	0.12	1.0
		Sodium, Total	7.2	MG/KG	3.9	1.0
		Nickel, Total	0.95 u	MG/KG	0.95	1.0
		Lead, Total	3.7 u	MG/KG	3.7	1.0
		Antimony, Total	2.6 u	MG/KG	2.6	1.0
		Selenium, Total	4.4 u	MG/KG	4.4	1.0
		Thallium, Total	5.0 u	MG/KG	5.0	1.0
		Vanadium, Total	0.35 u	MG/KG	0.35	1.0
		Zinc, Total	0.16 u	MG/KG	0.16	1.0
BLANK1	98C0385-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

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INORGANICS ACCURACY REPORT 09/29/98

CLIENT: TNU-HANFORD B98-087 RECRA LOT #: 9808L242

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	BONVP3	Silver, Total	7.5	9.6	6.2	-34.	1.0
		Silver, Total MSD	13.5	9.6	6.2	62.9	1.0
		Aluminum, Total	8430	8420	247	3.9*	1.0
		Aluminum, Total MSD	8280	8420	247	-54. *	1.0
		Arsenic, Total	260	43.4	247	87.9	1.0
		Arsenic, Total MSD	253	43.4	247	84.9	1.0
		Barium, Total	344	113	247	93.5	1.0
		Barium, Total MSD	336	113	247	90.0	1.0
		Beryllium, Total	5.5	0.26	6.2	84.6	1.0
		Beryllium, Total MSD	5.5	0.26	6.2	84.6	1.0
		Calcium, Total	83200	86700	3090	-110. *	1.0
		Calcium, Total MSD	85700	86700	3090	-34. *	1.0
		Cadmium, Total	4.8	0.49u	6.2	77.4	1.0
		Cadmium, Total MSD	4.8	0.49u	6.2	77.4	1.0
		Cobalt, Total	68.0	15.1	61.8	85.6	1.0
		Cobalt, Total MSD	67.7	15.1	61.8	85.1	1.0
		Chromium, Total	30.4	9.3	24.7	85.4	1.0
		Chromium, Total MSD	30.3	9.3	24.7	85.0	1.0
		Copper, Total	61.0	43.2	30.9	57.6	1.0
		Copper, Total MSD	66.6	43.2	30.9	75.7	1.0
		Iron, Total	18300	18400	124	-54. *	1.0
		Iron, Total MSD	19000	18400	124	523.6*	1.0
		Mercury, Total	0.23	0.02u	0.21	111.2	1.0
		Mercury, Total MSD	0.23	0.02u	0.21	112.1	1.0
		Potassium, Total	4100	1230	3090	92.8	1.0
		Potassium, Total MSD	4080	1230	3090	92.0	1.0
		Magnesium, Total	6820	4170	3090	85.5	1.0
		Magnesium, Total MSD	6770	4170	3090	84.0	1.0
		Manganese, Total	302	250	61.8	84.8*	1.0
		Manganese, Total MSD	301	250	61.8	83.3*	1.0
		Sodium, Total	3800	903	3090	93.9	1.0
		Sodium, Total MSD	3740	903	3090	92.0	1.0
		Nickel, Total	60.7	8.9	61.8	83.8	1.0
		Nickel, Total MSD	59.8	8.9	61.8	82.4	1.0
		Lead, Total	67.1	26.2	61.8	66.2	1.0
		Lead, Total MSD	80.5	26.2	61.8	87.9	1.0
		Antimony, Total	50.7	22.1	61.8	46.3	1.0
		Antimony, Total MSD	46.4	22.1	61.8	39.3	1.0
		Selenium, Total	227	5.4 u	247	91.8	1.0
		Selenium, Total MSD	215	5.4 u	247	86.9	1.0

Recra LabNet - Lionville

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SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	BONVP3	Thallium, Total	197	6.2 u	247	79.8	1.0
		Thallium, Total MSD	199	6.2 u	247	80.5	1.0
		Vanadium, Total	104	48.0	61.8	91.3	1.0
		Vanadium, Total MSD	104	48.0	61.8	91.4	1.0
		Zinc, Total	165	134	61.8	50.8	1.0
		Zinc, Total MSD	173	134	61.8	63.9	1.0

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INORGANICS DUPLICATE SPIKE REPORT 09/29/98

CLIENT: TNU-HANFORD B98-087 RECRA LOT #: 9808L242

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SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
-001	BONVP3	Silver, Total	-34.	62.9	666.7
		Aluminum, Total	3.9	-54. *	~~NC~~ 173.1
		Arsenic, Total	87.9	84.9	3.4
		Barium, Total	93.5	90.0	3.8
		Beryllium, Total	84.6	84.6	0.00
		Calcium, Total	-110.	-34. *	~~NC~~ 105.6
		Cadmium, Total	77.4	77.4	0.00
		Cobalt, Total	85.6	85.1	0.57
		Chromium, Total	85.4	85.0	0.48
		Copper, Total	57.6	75.7	27.2
		Iron, Total	-54.	523.6*	~~NC~~ 162.6
		Mercury, Total	111.2	112.1	0.87
		Potassium, Total	92.8	92.0	0.86
		Magnesium, Total	85.5	84.0	1.9
		Manganese, Total	84.8	83.3*	~~NC~~ 1.8
		Sodium, Total	93.9	92.0	2.0
		Nickel, Total	83.8	82.4	1.8
		Lead, Total	66.2	87.9	28.2
		Antimony, Total	46.3	39.3	16.3
		Selenium, Total	91.8	86.9	5.4
		Thallium, Total	79.8	80.5	0.86
		Vanadium, Total	91.3	91.4	0.18
		Zinc, Total	50.8	63.9	22.8

Corrections ND 9/29/98

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 09/29/98

CLIENT: TNU-HANFORD B98-087 RECRA LOT #: 9808L242

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	BONVP3	Silver, Total	9.6	5.9	47.7	1.0
		Aluminum, Total	8420	8090	4.0	1.0
		Arsenic, Total	43.4	35.7	19.5	1.0
		Barium, Total	113	110	2.6	1.0
		Beryllium, Total	0.26	0.27	3.8	1.0
		Calcium, Total	86700	81800	5.9	1.0
		Cadmium, Total	0.49u	0.49u	NC	1.0
		Cobalt, Total	15.1	14.7	2.7	1.0
		Chromium, Total	9.3	8.8	5.5	1.0
		Copper, Total	43.2	38.8	10.7	1.0
		Iron, Total	18400	19000	3.5	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Potassium, Total	1230	1200	2.6	1.0
		Magnesium, Total	4170	4030	3.5	1.0
		Manganese, Total	250	253	1.2	1.0
		Sodium, Total	903	879	2.7	1.0
		Nickel, Total	8.9	7.9	11.9	1.0
		Lead, Total	26.2	20.1	26.3	1.0
		Antimony, Total	22.1	21.0	5.1	1.0
		Selenium, Total	5.4 u	5.4 u	NC	1.0
		Thallium, Total	6.2 u	6.2 u	NC	1.0
		Vanadium, Total	48.0	54.9	13.4	1.0
		Zinc, Total	134	118	12.6	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 09/29/98

CLIENT: TNU-HANFORD B98-087 RECRA LOT #: 9808L242

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	98L1084-LC1	Silver, LCS	47.9	50.0	MG/KG	95.8
		Aluminum, LCS	490	500	MG/KG	97.9
		Arsenic, LCS	921	1000	MG/KG	92.1
		Barium, LCS	514	500	MG/KG	102.9
		Beryllium, LCS	22.9	25.0	MG/KG	91.6
		Calcium, LCS	2400	2500	MG/KG	96.0
		Cadmium, LCS	20.6	25.0	MG/KG	82.4
		Cobalt, LCS	242	250	MG/KG	96.9
		Chromium, LCS	48.0	50.0	MG/KG	96.0
		Copper, LCS	118	125	MG/KG	94.1
		Iron, LCS	475	500	MG/KG	95.0
		Potassium, LCS	2390	2500	MG/KG	95.5
		Magnesium, LCS	2300	2500	MG/KG	92.0
		Manganese, LCS	72.1	75.0	MG/KG	96.1
		Sodium, LCS	2380	2500	MG/KG	95.0
		Nickel, LCS	191	200	MG/KG	95.4
		Lead, LCS	232	250	MG/KG	93.0
		Antimony, LCS	287	300	MG/KG	95.6
		Selenium, LCS	918	1000	MG/KG	91.8
		Thallium, LCS	908	1000	MG/KG	90.8
		Vanadium, LCS	232	250	MG/KG	92.8
		Zinc, LCS	92.3	100	MG/KG	92.3
LCS1	98C0385-LC1	Mercury, LCS	1.1	1.2	MG/KG	94.4

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-087

DATE RECEIVED: 08/07/98 RFW LOT # :9808L242

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BONVP3						
SILVER, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
SILVER, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
SILVER, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
SILVER, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
ALUMINUM, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
ALUMINUM, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
ALUMINUM, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
ALUMINUM, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
ARSENIC, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
ARSENIC, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
ARSENIC, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
ARSENIC, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
BARIUM, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
BARIUM, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
BARIUM, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
BARIUM, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
BERYLLIUM, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/11/98
BERYLLIUM, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/11/98
BERYLLIUM, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/11/98
BERYLLIUM, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/11/98
CALCIUM, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
CALCIUM, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
CALCIUM, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
CALCIUM, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
CADMIUM, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
CADMIUM, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
CADMIUM, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
CADMIUM, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
COBALT, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
COBALT, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
COBALT, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
COBALT, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
CHROMIUM, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
CHROMIUM, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
CHROMIUM, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-087

DATE RECEIVED: 08/07/98 RFW LOT # :9808L242

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
COPPER, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
COPPER, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
COPPER, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
COPPER, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
IRON, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
IRON, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
IRON, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
IRON, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
MERCURY, TOTAL	001	S	98C0385	08/03/98	08/11/98	08/12/98
MERCURY, TOTAL	001 REP	S	98C0385	08/03/98	08/11/98	08/12/98
MERCURY, TOTAL	001 MS	S	98C0385	08/03/98	08/11/98	08/12/98
MERCURY, TOTAL	001 MSD	S	98C0385	08/03/98	08/11/98	08/12/98
POTASSIUM, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
POTASSIUM, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
POTASSIUM, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
POTASSIUM, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
MAGNESIUM, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
MAGNESIUM, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
MAGNESIUM, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
MAGNESIUM, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
MANGANESE, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
MANGANESE, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
MANGANESE, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
MANGANESE, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
SODIUM, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
SODIUM, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
SODIUM, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
SODIUM, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
NICKEL, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
NICKEL, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
NICKEL, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
NICKEL, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
LEAD, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
LEAD, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
LEAD, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
LEAD, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
ANTIMONY, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-087

DATE RECEIVED: 08/07/98 RFW LOT # :9808L242

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ANTIMONY, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
ANTIMONY, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
ANTIMONY, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
SELENIUM, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
SELENIUM, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
SELENIUM, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
SELENIUM, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
THALLIUM, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/11/98
THALLIUM, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/11/98
THALLIUM, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/11/98
THALLIUM, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/11/98
VANADIUM, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
VANADIUM, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
VANADIUM, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
VANADIUM, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
ZINC, TOTAL	001	S	98L1084	08/03/98	08/09/98	08/10/98
ZINC, TOTAL	001 REP	S	98L1084	08/03/98	08/09/98	08/10/98
ZINC, TOTAL	001 MS	S	98L1084	08/03/98	08/09/98	08/10/98
ZINC, TOTAL	001 MSD	S	98L1084	08/03/98	08/09/98	08/10/98
BONVP4						
SILVER, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
ALUMINUM, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
ARSENIC, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
BARIUM, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
BERYLLIUM, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/11/98
CALCIUM, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
CADMIUM, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
COBALT, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
CHROMIUM, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
COPPER, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
IRON, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
MERCURY, TOTAL	002	S	98C0385	08/03/98	08/11/98	08/12/98
POTASSIUM, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
MAGNESIUM, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
MANGANESE, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
SODIUM, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-087

DATE RECEIVED: 08/07/98 RFW LOT # :9808L242

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NICKEL, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
LEAD, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
ANTIMONY, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
SELENIUM, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
THALLIUM, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/11/98
VANADIUM, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
ZINC, TOTAL	002	S	98L1084	08/03/98	08/09/98	08/10/98
BONVP5						
SILVER, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
ALUMINUM, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
ARSENIC, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
BARIUM, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
BERYLLIUM, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/11/98
CALCIUM, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
CADMIUM, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
COBALT, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
CHROMIUM, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
COPPER, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
IRON, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
MERCURY, TOTAL	003	S	98C0385	08/03/98	08/11/98	08/12/98
POTASSIUM, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
MAGNESIUM, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
MANGANESE, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
SODIUM, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
NICKEL, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
LEAD, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
ANTIMONY, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
SELENIUM, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
THALLIUM, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/11/98
VANADIUM, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
ZINC, TOTAL	003	S	98L1084	08/03/98	08/09/98	08/10/98
BONVP6						
SILVER, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
ALUMINUM, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-087

DATE RECEIVED: 08/07/98 RFW LOT # :9808L242

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
BARIUM, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
BERYLLIUM, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/11/98
CALCIUM, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
CADMIUM, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
COBALT, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
CHROMIUM, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
COPPER, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
IRON, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
MERCURY, TOTAL	004	S	98C0385	08/03/98	08/11/98	08/12/98
POTASSIUM, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
MAGNESIUM, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
MANGANESE, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
SODIUM, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
NICKEL, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
LEAD, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
ANTIMONY, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
SELENIUM, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
THALLIUM, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/11/98
VANADIUM, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
ZINC, TOTAL	004	S	98L1084	08/03/98	08/09/98	08/10/98
BOP2W8						
SILVER, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
ALUMINUM, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
ARSENIC, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
BARIUM, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
BERYLLIUM, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/11/98
CALCIUM, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
CADMIUM, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
COBALT, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
CHROMIUM, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
COPPER, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
IRON, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
MERCURY, TOTAL	005	S	98C0385	08/03/98	08/11/98	08/12/98
POTASSIUM, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
MAGNESIUM, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-087

DATE RECEIVED: 08/07/98 RFW LOT # :9808L242

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MANGANESE, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
SODIUM, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
NICKEL, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
LEAD, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
ANTIMONY, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
SELENIUM, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
THALLIUM, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/11/98
VANADIUM, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98
ZINC, TOTAL	005	S	98L1084	08/03/98	08/09/98	08/10/98

LAB QC:

SILVER LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
SILVER, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
ALUMINUM LABORTORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
ALUMINUM, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
ARSENIC LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
ARSENIC, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
BARIUM LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
BARIUM, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
BERYLLIUM LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/11/98
BERYLLIUM, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/11/98
CALCIUM LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
CALCIUM, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
CADMIUM LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
CADMIUM, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
COBALT LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
COBALT, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
CHROMIUM LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
CHROMIUM, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
COPPER LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
COPPER, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
IRON LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
IRON, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
MERCURY LABORATORY	LC1 BS	S	98C0385	N/A	08/11/98	08/12/98
MERCURY, TOTAL	MB1	S	98C0385	N/A	08/11/98	08/12/98
POTASSIUM LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
POTASSIUM, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-087

DATE RECEIVED: 08/07/98 RFW LOT # :9808L242

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MAGNESIUM LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
MAGNESIUM, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
MANGANESE LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
MANGANESE, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
SODIUM LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
SODIUM, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
NICKEL LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
NICKEL, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
LEAD LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
LEAD, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
ANTIMONY LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
ANTIMONY, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
SELENIUM LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
SELENIUM, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
THALLIUM LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/11/98
THALLIUM, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/11/98
VANADIUM LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
VANADIUM, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98
ZINC LABORATORY	LC1 BS	S	98L1084	N/A	08/09/98	08/10/98
ZINC, TOTAL	MB1	S	98L1084	N/A	08/09/98	08/10/98

RECRA LabNet Use Only
9808L242

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TNU-Hanford B98-087
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #: STEVE MARSKE 373-4376
RECRA Project Manager: MARIE SCHNEIDER
QC: SPEC Del: SPEC TAT: 3 day
Date Rec'd: 8/7/98 Date Due: 8/10/98
Account #: TNU HANFORD

Refrigerator #				3					3												
#/Type Container	Liquid																				
	Solid			1g					1g												
Volume	Liquid																				
	Solid			60					60												
Preservatives																					
ANALYSES REQUESTED →		ORGANIC							INORG												
		VOA	BNA	Pest/PCB	Herb				Metal	CN											
		RECRA LabNet Use Only																			
				OPCB					MHSLTO												

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	OPCB	MHSLTO
001	BONVP3			SO	8/3/98	1235	✓	✓
2	4						✓	✓
3	5					1253	✓	✓
4	6					1312	✓	✓
5	BOP2W8					1337	✓	✓

Special Instructions:
RSA: CLIENT INFO
RMSC: COMP
SAF # = B98-087
SDG # =

RUN MATRIX QC

DATE/REVISIONS:
1 Run Matrix QC
2 Any sample
3
4
5
6

Relinquished by	Received by	Date	Time
Jedel	Jadu	8/7/98	0930

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

RECRA LabNet Use Only

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

COC Tape was
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N
Cooler Temp 19.3 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES
*4019607 1170

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-087-23

Page 1 of 2 RJN 8/4/98

Collector Fahlberg/Nielson	**Company Contact** Steve Marske	**Telephone No.** 373-4316	**Project Coordinator** TRENT, SJ
Project Designation 105-C Phase II - Verification Sampling - Concrete	**Sampling Location** 105-C		**SAF No.** B98-087
Ice Chest No. Drum 2 of 2	**Field Logbook No.** EL 1309-2		**Method of Shipment** Federal Express
Shipped To ~~Quanterra Incorporated~~ RJN 8/4/98 RECRA LabNet	**Offsite Property No.** A980030		**Bill of Lading/Air Bill No.** 212
Waste Designation Client determined no waste codes associated with this project.			**COA**

Data Turnaround ~~21 Days~~ RJN 3 days 8/4/98

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	None	Cool 4C	None	None							
	Type of Container	aG	aG	aG	aG							
	No. of Container(s)	0	1	1	1							
Special Handling and/or Storage	Volume	60mL	60mL	60mL	60mL							
SAMPLE ANALYSIS		Activity Scan	PCBs - 8080 (Aroclor-1254) 0PCB	See item (1) in Special Instructions	ICP Metals - 6010A (Add-on) (Lead), Mercury - 7471 - (CV)							

Sample No.	Matrix *	Sample Date	Sample Time										
B0NVP3	Other Solid	8-3-98	1235		X		X					B0NV	X2
B0NVP4	Other Solid	8-3-98	1235		X		X					B0NV	X2
B0NVP5	Other Solid	8-3-98	1253		X		X					B0NV	X4
B0NVP6	Other Solid	8-3-98	1312		X		X					B0NV	X5
B0P2W8	Other Solid	8-3-98	1337		X		X					B0P2	Y2

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

Relinquished By	Date/Time	Received By	Date/Time
Rene Nielson R Nielson	8/4/98	Fed Ex	
Fedex		Stoller	8/7/98 0930

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium, Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr

Matrix *

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

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

024

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

OCT 1998 RECEIVED Data Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD
RFW# : 9808L242
SDG/SAF: H0187 /B98-087

W.O.# : 10985-001-001-9999-00
Date Received : 08-07-98

PCB

The set of samples consisted of five (5) soil samples collected on 08-03-98.

The samples and their associated QC samples were extracted on 08-13,18-98 and analyzed on 08-14,15,19-98 according to Recra OPs based on SW846, 3rd Edition, Method 3540 and Method 8081.

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 time for extraction was met with the exception of samples BONVP3, BONVP5 and BONVP6. All analyses holding time were met. A copy of the Sample Discrepancy Report has been enclosed.

3. The samples and their associated QC samples received a sulfuric acid and sulfur cleanup.

4. The method blanks were below the reporting limits for all target compounds.

5. All surrogate recoveries were within acceptance criteria.

6. The blank spike sample (98LE1248-MB1 BS) contained Aroclor-1268 at a level above the reporting limit. However, Aroclor-1268 was a non-target compound and was not detected in any samples processed with this blank spike at levels or above the reporting limit. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

7. All matrix spike recoveries were within acceptance criteria.

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

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.

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

10. Patterns for Aroclor-1254 and Aroclor-1260 were identified in these samples. The reported Aroclor was chosen based on the best pattern and fit. Quantitation was performed using congeners common to both Aroclors to give the best overall total PCB concentration.

Bruce C. Miller
for J. Michael Taylor
Vice President
Lionville Analytical Laboratory

9-28-97
Date

som\pcb\word6.0\pest-pcb\tru8p242.doc

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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 Philadelphia **Sample Discrepancy Report (SDR)** SDR #: 98GC324

Initiator: G. Lage
Date: 8-19-98
Client: TNU

RFW Batch: 98081240 / 98081242
Samples: -001 / -002, 005
Method: SW846/MCAWW/CLP/

Parameter: OPCB
Matrix: Soils
Prep Batch: 98LE134Y

1. Reason for SDR

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

b. General Discrepancy

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

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

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

BS contained Aroclor-1268 most likely from high levels found in another clients samples extracted within the ~~same~~ same extraction batch. Aroclor-1268 is a non target compound and no significant levels were identified in these samples.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

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

4. Project Manager Instructions...signature/date: gh 8/19/98

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

5. Final Action...signature/date: [illegible] 8/25/98 Other Explanation:

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

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

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Doughty
__	X Lab Manager: J. Michael Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: J Stone / MS	__	__ GC/LC: Rycklak/Schnell
__	X Section Mgr: Siery/Durke/Daniels	__	__ MS: LeMin/McIntyre/Taylor/Kasdras
__	X QA (file): Racioppi	__	__ Log-in: Toder
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Schnell/Doughty/Kauffman	__	__ Other: _____

L-WI-006/E-07/96

Recra LabNet Philadelphia **Sample Discrepancy Report (SDR)** SDR #: 98EX178

Initiator: L. Koff
Date: 7/8/98
Client: TNU

RFW Batch: 98081242
Samples: 001, 003, 004
Method: SW846/MCAWW/CLP/

Parameter: OPCB
Matrix: Soil
Prep Batch: 98LE1373

1. Reason for SDR

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

b. General Discrepancy

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

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

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

2. Known or Probable Causes(s)

These samples were not made available to extraction until 4 days after holding time was exceeded. The rest of the group (002, 005) were available and extracted on time.

3. Discussion and Proposed Action **Other Description:**

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

4. Project Manager Instructions...signature/date: [signature] 9/9/98

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
✓ Client Contacted:
Date/Person [illegible] 9/9/98
__ Add
__ Cancel

Analyze & note in narrative. (SDG # H0187)

5. Final Action...signature/date: _____ Other Explanation:

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

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

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Doughty
__	X Lab Manager: J. Michael Taylor	__	__ Inorganic: Perrone
1	X Project Mgr: M. Schroder	2	X GC/LC: Ryckiak/Schnell
__	X Section Mgr: Siery/Durke/Daniels	__	__ MS: LeMin/McIntyre/Taylor/Kasdras
__	X QA (file): Racioppi	__	__ Log-in: Toder
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Schnell/Doughty/Kauffman	__	__ Other: _____

L-WI-006/E-07/98

Recra LabNet - Lionville Laboratory

PCBs by GC

Report Date: 09/01/98 16:32

RFW Batch Number: **9808L242** Client: **TNU-HANFORD B98-087** Work Order: 10985001001 Page: 1

	Cust ID:	BONVP3	BONVP4	BONVP5	BONVP6	BONVP6	BONVP6
Sample Information	RFW#:	001	002	003	004	004 MS	004 MSD
	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	95 %	75 %	65 %	88 %	85 %	90 %
	Decachlorobiphenyl	84 %	56 %	70 %	91 %	82 %	87 %
		fl	fl	fl	fl	fl	fl
Aroclor-1016		290 U	41 U	74 U	180 U	180 U	180 U
Aroclor-1221		580 U	81 U	150 U	370 U	360 U	350 U
Aroclor-1232		290 U	41 U	74 U	180 U	180 U	180 U
Aroclor-1242		290 U	41 U	74 U	180 U	180 U	180 U
Aroclor-1248		290 U	41 U	74 U	180 U	180 U	180 U
Aroclor-1254		270	200	74 U	180 U	94 %	97 %
Aroclor-1260		290 U	41 U	74 U	180 U	180 U	180 U

	Cust ID:	BOP2W8	PBLKNC	PBLKNC BS	PBLKMR	PBLKMR BS
Sample Information	RFW#:	005	98LE1373-MB1	98LE1373-MB1	98LE1348-MB1	98LE1348-MB1
	Matrix:	SOIL	SOIL	SOIL	SOLID	SOLID
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	70 %	70 %	65 %	85 %	88 %
	Decachlorobiphenyl	71 %	76 %	73 %	89 %	93 %
		fl	fl	fl	fl	fl
Aroclor-1016		40 U	33 U	33 U	33 U	33 U
Aroclor-1221		80 U	67 U	67 U	67 U	67 U
Aroclor-1232		40 U	33 U	33 U	33 U	33 U
Aroclor-1242		40 U	33 U	33 U	33 U	33 U
Aroclor-1248		40 U	33 U	33 U	33 U	33 U
Aroclor-1254		120	33 U	83 %	33 U	92 %
Aroclor-1260		40 U	33 U	33 U	33 U	33 U

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

DR 9/1/98

Recra LabNet - Lionville Laboratory
PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B98-087

DATE RECEIVED: 08/07/98 RFW LOT # :9808L242

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BONVP3	001	S	98LE1373	08/03/98	08/18/98	08/19/98
BONVP4	002	S	98LE1348	08/03/98	08/13/98	08/15/98
BONVP5	003	S	98LE1373	08/03/98	08/18/98	08/19/98
BONVP6	004	S	98LE1373	08/03/98	08/18/98	08/19/98
BONVP6	004 MS	S	98LE1373	08/03/98	08/18/98	08/19/98
BONVP6	004 MSD	S	98LE1373	08/03/98	08/18/98	08/19/98
BOP2W8	005	S	98LE1348	08/03/98	08/13/98	08/15/98

LAB QC:

PBLKNC	MB1	S	98LE1373	N/A	08/18/98	08/19/98
PBLKNC	MB1 BS	S	98LE1373	N/A	08/18/98	08/19/98
PBLKMR	MB1	SO	98LE1348	N/A	08/13/98	08/14/98
PBLKMR	MB1 BS	SO	98LE1348	N/A	08/13/98	08/14/98

JC 9/11/98

RECRA LabNet Use Only

9808C242

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client TNU - Hanford B98-087

Est. Final Proj. Sampling Date

Project # 10985-001-001-9999-00

Project Contact/Phone # STEVE MARSKE 373-4376

RECRA Project Manager MARIE SCHNEIDER

QC SPEC Del SPEC TAT 3 day

Date Rec'd 8/7/98 Date Due 8/10/98

Account # TNU HANFORD

Refrigerator #		3	3
#/Type Container	Liquid		
	Solid	1g	1g
Volume	Liquid		
	Solid	60	60
Preservatives			

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

RECRA LabNet Use Only

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	ORGANIC: VOA	BNA	Pest/PCB	Herb	INORG: Metal	CN
									OPCB		MHSLTO	
001	BONVP3			SO	8/3/98	1235			✓		✓	
2	4								✓		✓	
3	5					1253			✓		✓	
4	6					1312			✓		✓	
5	BOP2W8					1337			✓		✓	

Special Instructions:

RSA: CLIENT INFO

RMSC: COMP

SAF # = B98-087

SDG # =

RUN MATRIX QC

DATE/REVISIONS:

1 Run Matrix QC

2 Any sample

3

4

5

6

Relinquished by	Received by	Date	Time
Jedel	Jalu	8/7/98	0430

ORIGINAL REWRITTEN

Relinquished by	Received by	Date	Time

RECRA LabNet Use Only

Samples were ✓ 1) Shipped or Hand Delivered

Airbill # *

2) Ambient or Chilled

3) Received in Good Condition Y or N

4) Labels Indicate Properly Preserved Y or N

5) Received Within Holding Times Y or N

COC Tape was 1) Present on Outer Package Y or N

2) Unbroken on Outer Package Y or N

3) Present on Sample Y or N

4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp 19.3

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES

* [illegible]

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-087-23

Collector: Lahlberg/Nielson	Company Contact: Steve Marske	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Project Designation: 105-C Phase II - Verification Sampling - Concrete	Sampling Location: 105-C		SAF No.: B98-087
Ice Chest No.: Drum 2 of 2	Field Logbook No.: EL 1309-2		Method of Shipment: Federal Express
Shipped To: ~~Quadrex Incorporated~~ RUN 8/4/98 RECRA LabNet	Offsite Property No.: A980030		Bill of Lading/Air Bill No.: 7112
Waste Designation: Client determined no waste codes associated with this project			COA

Data Turnaround: ~~21 Days~~ RUN 3 days 8/4/98

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	Cool 4C	None	None								
Type of Container	aG	aG	aG	aG								
No. of Container(s)	0	1	1	1								
Volume	60mL	60mL	60mL	60mL								

SAMPLE ANALYSIS

Sample No	Matrix *	Sample Date	Sample Time	Activity Scan	PCBs - 8080 (Aroclor-1254) OPCS	See item (1) in Special Instructions	ICP Metals - 6010A (Add-on) (Lead), Mercury - 7471 - (CV)						
B0NVP3	Other Solid	8-3-98	1235		X		X						B0NVX2
B0NVP4	Other Solid	8-3-98	1235		X		X						B0NVX2
B0NVP5	Other Solid	8-3-98	1253		X		X						B0NVX4
B0NVP6	Other Solid	8-3-98	1312		X		X						B0NVX5
B0P2W8	Other Solid	8-3-98	1337		X		X						B0P2X2

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	[illegible]	8/4/98	Fed Ex	
Relinquished By	Fed Ex		Received By	[illegible] 8/7/98 0930
Relinquished By			Received By	
Relinquished By			Received By	

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium, Isotopic Uranium, Americium-241, Strontium-89,90 -- Total Sr

Matrix *

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

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

H0187-T/D

Thermo Nutech
W.O. No. N8-08-014-7487, SDG H0187

Bechtel Hanford Inc.
P.O. TRB-SBB-207925

Case Narrative

1.0 GENERAL

Thermo Nutech Sample Delivery Group H0187 is comprised of five solid samples designated under SAF No. B98-087 with a Project Designation of : 105-C Phase II - Verification Sampling - Concrete.

The sample was received as stated on the Chain-of-Custody documents.

2.0 ANALYSIS NOTES

2.1 Total Strontium Analyses

No problems were encountered with the analyses.

2.2 Isotopic Uranium Analyses

The U235 LCS recovery was 78%, less than the lower protocol limit of 80% but within the 3σ total limit of 74-126%. The MDA's of the uranium isotopes for the LCS were greater than the RDL, however due to the activity of the LCS the elevated MDA's are not a problem.

2.3 Isotopic Plutonium Analyses

No problems were encountered with the analyses. Some MDA's were greater than the RDL due to relatively low tracer yields. The samples were counted for at least 1000 minutes each in order to acheive an MDA as close to the RDL as possible.

2.4 Americium-241 Analyses

No problems were encountered with the analyses. All sample MDA's were less than the RDL.

2.5 Gamma Scan Analyses

All MDA's were greater than the RDL's due to the limited amounts of samples received. The aliquots for the analysis were musch less than the target 750 g.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

SAMPLE SUMMARY

SDG 7487
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0187

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0NVP3	105-C	SOLID		N808014-01	B98-087	B98-087-23	08/03/98 12:35
B0NVP4	105-C	SOLID		N808014-02	B98-087	B98-087-23	08/03/98 12:35
B0NVP5	105-C	SOLID		N808014-03	B98-087	B98-087-23	08/03/98 12:53
B0NVP6	105-C	SOLID		N808014-04	B98-087	B98-087-23	08/03/98 13:12
B0P2W8	105-C	SOLID		N808014-05	B98-087	B98-087-23	08/03/98 13:37
Method Blank		SOLID		N808014-07	B98-087		
Lab Control Sample		SOLID		N808014-06	B98-087		
Duplicate (N808014-01)	105-C	SOLID		N808014-08	B98-087		08/03/98 12:35

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

QC SUMMARY

SDG 7487
Contact N. Joseph Verville

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0187

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7487	B98-087-23	B0NVP3	SOLID				08/05/98	2	N808014-01	7487-001
		B0NVP4	SOLID				08/05/98	2	N808014-02	7487-002
		B0NVP5	SOLID				08/05/98	2	N808014-03	7487-003
		B0NVP6	SOLID				08/05/98	2	N808014-04	7487-004
		B0P2W8	SOLID				08/05/98	2	N808014-05	7487-005
		Method Blank	SOLID						N808014-07	7487-007
		Lab Control Sample	SOLID						N808014-06	7487-006
		Duplicate (N808014-01)	SOLID				08/05/98	2	N808014-08	7487-008

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

SDG 7487
Contact N. Joseph Verville

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0187

TEST	MATRIX	METHOD	PREPARATION ERROR BATCH	2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	2785-105	5.0	5			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Soil	2785-105	5.0	5			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	2785-105	5.0	5			1	1	1/1		
Beta Counting												
SR	SOLID	Strontium, Total in Soil	2785-105	10.0	5			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	2785-105	15.0	5			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 08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

SDG 7487
Contact N. Joseph Verville

WORK SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0187

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0NVP3			N808014-01	7487-001	AM		08/19/98	08/24/98	NJV	Americium 241 in Soil
105-C		SOLID	08/03/98	7487-001	GAM		08/12/98	08/24/98	NJV	Gamma Scan
B98-087-23	B98-087		08/05/98	7487-001	PU		08/17/98	08/24/98	NJV	Plutonium, Isotopic in Soil
				7487-001	SR		08/12/98	08/24/98	NJV	Strontium, Total in Soil
				7487-001	U		08/13/98	08/24/98	NJV	Uranium, Isotopic in Soil
B0NVP4			N808014-02	7487-002	AM		08/19/98	08/24/98	NJV	Americium 241 in Soil
105-C		SOLID	08/03/98	7487-002	GAM		08/12/98	08/24/98	NJV	Gamma Scan
B98-087-23	B98-087		08/05/98	7487-002	PU		08/17/98	08/24/98	NJV	Plutonium, Isotopic in Soil
				7487-002	SR		08/12/98	08/24/98	NJV	Strontium, Total in Soil
				7487-002	U		08/13/98	08/24/98	NJV	Uranium, Isotopic in Soil
B0NVP5			N808014-03	7487-003	AM		08/19/98	08/24/98	NJV	Americium 241 in Soil
105-C		SOLID	08/03/98	7487-003	GAM		08/13/98	08/24/98	NJV	Gamma Scan
B98-087-23	B98-087		08/05/98	7487-003	PU		08/17/98	08/24/98	NJV	Plutonium, Isotopic in Soil
				7487-003	SR		08/12/98	08/24/98	NJV	Strontium, Total in Soil
				7487-003	U		08/13/98	08/24/98	NJV	Uranium, Isotopic in Soil
B0NVP6			N808014-04	7487-004	AM		08/19/98	08/24/98	NJV	Americium 241 in Soil
105-C		SOLID	08/03/98	7487-004	GAM		08/13/98	08/24/98	NJV	Gamma Scan
B98-087-23	B98-087		08/05/98	7487-004	PU		08/17/98	08/24/98	NJV	Plutonium, Isotopic in Soil
				7487-004	SR		08/12/98	08/24/98	NJV	Strontium, Total in Soil
				7487-004	U		08/13/98	08/24/98	NJV	Uranium, Isotopic in Soil
B0P2W8			N808014-05	7487-005	AM		08/19/98	08/24/98	NJV	Americium 241 in Soil
105-C		SOLID	08/03/98	7487-005	GAM		08/13/98	08/24/98	NJV	Gamma Scan
B98-087-23	B98-087		08/05/98	7487-005	PU		08/17/98	08/24/98	NJV	Plutonium, Isotopic in Soil
				7487-005	SR		08/12/98	08/24/98	NJV	Strontium, Total in Soil
				7487-005	U		08/16/98	08/24/98	NJV	Uranium, Isotopic in Soil
Method Blank			N808014-07	7487-007	AM		08/19/98	08/24/98	NJV	Americium 241 in Soil
		SOLID		7487-007	GAM		08/14/98	08/24/98	NJV	Gamma Scan
	B98-087			7487-007	PU		08/17/98	08/24/98	NJV	Plutonium, Isotopic in Soil
				7487-007	SR		08/12/98	08/24/98	NJV	Strontium, Total in Soil
				7487-007	U		08/13/98	08/24/98	NJV	Uranium, Isotopic in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

SDG 7487
Contact N. Joseph Verville

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0187

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Lab Control Sample			N808014-06	7487-006	AM		08/19/98	08/24/98	NJV	Americium 241 in Soil
		SOLID		7487-006	GAM		08/13/98	08/24/98	NJV	Gamma Scan
	B98-087			7487-006	PU		08/17/98	08/24/98	NJV	Plutonium, Isotopic in Soil
				7487-006	SR		08/12/98	08/24/98	NJV	Strontium, Total in Soil
				7487-006	U		08/13/98	08/24/98	NJV	Uranium, Isotopic in Soil
Duplicate (N808014-01)			N808014-08	7487-008	AM		08/19/98	08/24/98	NJV	Americium 241 in Soil
105-C		SOLID	08/03/98	7487-008	GAM		08/14/98	08/24/98	NJV	Gamma Scan
	B98-087		08/05/98	7487-008	PU		08/17/98	08/24/98	NJV	Plutonium, Isotopic in Soil
				7487-008	SR		08/12/98	08/24/98	NJV	Strontium, Total in Soil
				7487-008	U		08/13/98	08/24/98	NJV	Uranium, Isotopic in Soil

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B98-087	Americium 241 in Soil	AM/CMPLATE	5			1	1	1	8
GAM	B98-087	Gamma Scan	GAMMAHI	5			1	1	1	8
PU	B98-087	Plutonium, Isotopic in Soil	PUPLATE	5			1	1	1	8
SR	B98-087	Strontium, Total in Soil	SR8990	5			1	1	1	8
U	B98-087	Uranium, Isotopic in Soil	UPLATE	5			1	1	1	8
TOTALS				25			5	5	5	40

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 08/27/98

N808014-07

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

METHOD BLANK

Method Blank

SDG 7487 Client/Case no Hanford SDG H0187
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N808014-07 Client sample id Method Blank
Dept sample id 7487-007 Material/Matrix SOLID
SAF No B98-087

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	0.10	0.39	0.30	U	U
Uranium 235	15117-96-1	0	0.12	0.47	0.30	U	U
Uranium 238	U-238	0	0.10	0.39	0.30	U	U
Plutonium 238	13981-16-3	-0.091	0.092	0.44	0.050	U	PU
Plutonium 239/240	15117-48-3	-0.046	0.27	0.56	0.050	U	PU
Americium 241	14596-10-2	0.002	0.008	0.016	0.050	U	AM
Total Strontium	SR-89/90	0.96	2.4	5.2	1.0	U	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		0.076		U	GAM
Cobalt 60	10198-40-0	U		0.007	0.050	U	GAM
Cesium 137	10045-97-3	U		0.006	0.050	U	GAM
Europium 152	14683-23-9	U		0.014	0.10	U	GAM
Europium 154	15585-10-1	U		0.020	0.10	U	GAM
Europium 155	14391-16-3	U		0.010	0.10	U	GAM

QC-BLANK 28818

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/27/98

N808014-06

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

LAB CONTROL SAMPLE

Lab Control Sample

SDG 7487
Contact N. Joseph Verville

Client/Case no Hanford SDG H0187
Case no TRB-SBB-207925

Lab sample id N808014-06
Dept sample id 7487-006

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B98-087

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	8.4	1.7	0.80	0.30		U	9.50	0.38	88	72-128	80-120
Uranium 235	6.1	1.3	0.36	0.30		U	7.78	0.31	78	74-126	80-120
Uranium 238	9.5	1.7	0.77	0.30		U	9.80	0.39	97	72-128	80-120
Plutonium 238	48	3.4	0.18	0.050		PU	50.6	2.0	95	86-114	80-120
Plutonium 239/240	52	3.6	0.18	0.050		PU	52.9	2.1	98	86-114	80-120
Americium 241	4.4	0.33	0.015	0.050		AM	4.80	0.19	92	86-114	80-120
Total Strontium	120	11	5.5	1.0		SR	112	4.5	107	77-123	
GAMMA SCAN ANALYTES	U										
Cobalt 60	0.29	0.017	0.008	0.050		GAM	0.333	0.013	87	78-122	80-120
Cesium 137	0.32	0.014	0.010	0.050		GAM	0.352	0.014	91	78-122	80-120

QC-LCS 28817

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 08/27/98

N808014-08

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

DUPLICATE

B0NVP3

SDG 7487
Contact N. Joseph Verville

Client/Case no Hanford SDG H0187
Case no TRB-SBB-207925

DUPLICATE
Lab sample id N808014-08
Dept sample id 7487-008

ORIGINAL
Lab sample id N808014-01
Dept sample id 7487-001
Received 08/05/98

Client sample id B0NVP3
Location/Matrix 105-C SOLID
Collected 08/03/98 12:35
Custody/SAF No B98-087-23 B98-087

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Uranium 233/234	0.54	0.23	0.17	0.30		U	0.44	0.25	0.23		20	104
Uranium 235	0	0.053	0.20	0.30	U	U	0	0.071	0.27	U	-	
Uranium 238	0.59	0.23	0.17	0.30		U	0.35	0.19	0.23		51	96
Plutonium 238	0	0.009	0.034	0.050	U	PU	0.004	0.030	0.054	U	-	
Plutonium 239/240	0.088	0.045	0.034	0.050		PU	0.14	0.047	0.029		46	86
Americium 241	0.037	0.028	0.035	0.050	J	AM	0.081	0.029	0.021		75	103
Total Strontium	1.5	0.42	0.50	1.0		SR	2.1	0.53	0.59		33	60
GAMMA SCAN ANALYTES	U						U					
Potassium 40	9.5	1.5	1.0			GAM	8.2	1.7	1.1		15	50
Cobalt 60	1.8	0.21	0.16	0.050		GAM	2.1	0.21	0.12		15	39
Cesium 137	5.2	0.24	0.14	0.050		GAM	5.3	0.24	0.14		2	33
Europium 152	0.36	0.22	0.30	0.10		GAM	U		0.34	U	6	176
Europium 154	U		0.32	0.10	U	GAM	U		0.34	U	-	
Europium 155	U		0.25	0.10	U	GAM	U		0.20	U	-	
Radium 226	0.50	0.18	0.21	0.10		GAM	0.45	0.21	0.22		11	93
Radium 228	U			0.20	J	GAM	0.66	0.46	0.51		26	176
Thorium 228	0.53	0.19	0.21			GAM	0.44	0.15	0.16		19	81
Thorium 232	U					GAM	0.66	0.46	0.51		26	176

QC-DUP#1 28819

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 08/27/98

N808014-01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

DATA SHEET

B0NVP3

SDG	7487	Client/Case no	Hanford SDG H0187
Contact	N. Joseph Verville	Case no	TRB-SBB-207925
Lab sample id	N808014-01	Client sample id	B0NVP3
Dept sample id	7487-001	Location/Matrix	105-C SOLID
Received	08/05/98	Collected	08/03/98 12:35
		Custody/SAF No	B98-087-23 B98-087

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.44	0.25	0.23	0.30		U
Uranium 235	15117-96-1	0	0.071	0.27	0.30	U	U
Uranium 238	U-238	0.35	0.19	0.23	0.30		U
Plutonium 238	13981-16-3	0.004	0.030	0.054	0.050	U	PU
Plutonium 239/240	15117-48-3	0.14	0.047	0.029	0.050		PU
Americium 241	14596-10-2	0.081	0.029	0.021	0.050		AM
Total Strontium	SR-89/90	2.1	0.53	0.59	1.0		SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	8.2	1.7	1.1			GAM
Cobalt 60	10198-40-0	2.1	0.21	0.12	0.050		GAM
Cesium 137	10045-97-3	5.3	0.24	0.14	0.050		GAM
Europium 152	14683-23-9	U		0.34	0.10	U	GAM
Europium 154	15585-10-1	U		0.34	0.10	U	GAM
Europium 155	14391-16-3	U		0.20	0.10	U	GAM
Radium 226	13982-63-3	0.45	0.21	0.22	0.10		GAM
Radium 228	15262-20-1	0.66	0.46	0.51	0.20		GAM
Thorium 228	14274-82-9	0.44	0.15	0.16			GAM
Thorium 232	7440-29-1	0.66	0.46	0.51			GAM

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

N808014-02

DATA SHEET

B0NVP4

SDG	7487	Client/Case no	Hanford SDG H0187
Contact	N. Joseph Verville	Case no	TRB-SBB-207925
Lab sample id	N808014-02	Client sample id	B0NVP4
Dept sample id	7487-002	Location/Matrix	105-C SOLID
Received	08/05/98	Collected	08/03/98 12:35
		Custody/SAF No	B98-087-23 B98-087

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.52	0.22	0.20	0.30		U
Uranium 235	15117-96-1	0.095	0.13	0.24	0.30	U	U
Uranium 238	U-238	0.34	0.22	0.20	0.30		U
Plutonium 238	13981-16-3	0.013	0.020	0.034	0.050	U	PU
Plutonium 239/240	15117-48-3	0.060	0.026	0.019	0.050		PU
Americium 241	14596-10-2	0.035	0.032	0.045	0.050	U	AM
Total Strontium	SR-89/90	0.92	0.35	0.50	1.0	J	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	6.9	1.2	0.86			GAM
Cobalt 60	10198-40-0	2.1	0.18	0.11	0.050		GAM
Cesium 137	10045-97-3	4.5	0.20	0.13	0.050		GAM
Europium 152	14683-23-9	0.23	0.17	0.26	0.10	U	GAM
Europium 154	15585-10-1	U		0.30	0.10	U	GAM
Europium 155	14391-16-3	U		0.22	0.10	U	GAM
Radium 226	13982-63-3	0.33	0.19	0.23	0.10		GAM
Radium 228	15262-20-1	0.54	0.39	0.46	0.20		GAM
Thorium 228	14274-82-9	0.41	0.14	0.16			GAM
Thorium 232	7440-29-1	0.54	0.39	0.46			GAM

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

N808014-03

DATA SHEET

B0NVP5

SDG 7487 Client/Case no Hanford SDG H0187
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N808014-03 Client sample id B0NVP5
Dept sample id 7487-003 Location/Matrix 105-C SOLID
Received 08/05/98 Collected 08/03/98 12:53
Custody/SAF No B98-087-23 B98-087

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.65	0.24	0.17	0.30		U
Uranium 235	15117-96-1	0	0.055	0.21	0.30	U	U
Uranium 238	U-238	0.41	0.19	0.17	0.30		U
Plutonium 238	13981-16-3	-0.003	0.012	0.025	0.050	U	PU
Plutonium 239/240	15117-48-3	0.037	0.015	0.014	0.050	J	PU
Americium 241	14596-10-2	0.022	0.016	0.016	0.050	J	AM
Total Strontium	SR-89/90	0.86	0.34	0.49	1.0	J	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	6.7	1.5	1.2			GAM
Cobalt 60	10198-40-0	0.27	0.15	0.14	0.050		GAM
Cesium 137	10045-97-3	2.4	0.20	0.13	0.050		GAM
Europium 152	14683-23-9	U		0.30	0.10	U	GAM
Europium 154	15585-10-1	U		0.39	0.10	U	GAM
Europium 155	14391-16-3	U		0.20	0.10	U	GAM
Radium 226	13982-63-3	0.50	0.22	0.22	0.10		GAM
Thorium 228	14274-82-9	0.55	0.18	0.17			GAM

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

N808014-04

DATA SHEET

B0NVP6

SDG	7487	Client/Case no	Hanford SDG H0187
Contact	N. Joseph Verville	Case no	TRB-SBB-207925
Lab sample id	N808014-04	Client sample id	B0NVP6
Dept sample id	7487-004	Location/Matrix	105-C SOLID
Received	08/05/98	Collected	08/03/98 13:12
		Custody/SAF No	B98-087-23 B98-087

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.50	0.26	0.24	0.30		U
Uranium 235	15117-96-1	0	0.076	0.29	0.30	U	U
Uranium 238	U-238	0.54	0.27	0.24	0.30		U
Plutonium 238	13981-16-3	0.016	0.033	0.054	0.050	U	PU
Plutonium 239/240	15117-48-3	0.24	0.058	0.030	0.050		PU
Americium 241	14596-10-2	0.11	0.033	0.018	0.050		AM
Total Strontium	SR-89/90	4.5	0.66	0.53	1.0		SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	7.5	1.4	0.95			GAM
Cobalt 60	10198-40-0	1.5	0.19	0.14	0.050		GAM
Cesium 137	10045-97-3	9.0	0.29	0.15	0.050		GAM
Europium 152	14683-23-9	U		0.36	0.10	U	GAM
Europium 154	15585-10-1	U		0.39	0.10	U	GAM
Europium 155	14391-16-3	U		0.27	0.10	U	GAM
Radium 226	13982-63-3	0.44	0.21	0.25	0.10		GAM
Thorium 228	14274-82-9	0.44	0.16	0.19			GAM

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

N808014-05

DATA SHEET

B0P2W8

SDG	7487	Client/Case no	Hanford SDG H0187
Contact	N. Joseph Verville	Case no	TRB-SBB-207925
Lab sample id	N808014-05	Client sample id	B0P2W8
Dept sample id	7487-005	Location/Matrix	105-C SOLID
Received	08/05/98	Collected	08/03/98 13:37
		Custody/SAF No	B98-087-23 B98-087

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.59	0.16	0.073	0.30		U
Uranium 235	15117-96-1	0.012	0.023	0.088	0.30	U	U
Uranium 238	U-238	0.46	0.14	0.073	0.30		U
Plutonium 238	13981-16-3	0.055	0.037	0.056	0.050	U	PU
Plutonium 239/240	15117-48-3	0.75	0.14	0.050	0.050		PU
Americium 241	14596-10-2	0.37	0.063	0.017	0.050		AM
Total Strontium	SR-89/90	66	3.6	0.75	1.0		SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	7.7	1.5	1.1			GAM
Cobalt 60	10198-40-0	1.3	0.18	0.12	0.050		GAM
Cesium 137	10045-97-3	160	1.1	0.31	0.050		GAM
Europium 152	14683-23-9	U		1.1	0.10	U	GAM
Europium 154	15585-10-1	U		0.39	0.10	U	GAM
Europium 155	14391-16-3	U		0.59	0.10	U	GAM
Radium 226	13982-63-3	0.35	0.30	0.40	0.10	U	GAM
Thorium 228	14274-82-9	0.33	0.30	0.41		U	GAM

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

Test AM Matrix SOLID
SDG 7487
Contact N. Joseph Verville

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0187

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241
Preparation batch 2785-105					
B0NVP3	N808014-01			7487-001	0.081
B0NVP4	N808014-02			7487-002	U
B0NVP5	N808014-03			7487-003	0.022 J
B0NVP6	N808014-04			7487-004	0.11
B0P2W8	N808014-05			7487-005	0.37
BLK (QC ID=28818)	N808014-07			7487-007	U
LCS (QC ID=28817)	N808014-06			7487-006	ok
Duplicate (N808014-01)	N808014-08			7487-008	ok J
Nominal values and limits from method				RDLs (pCi/g)	0.050

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2785-105	2σ prep error 5.0 %				Reference Lab		Notebook #2785 pg. 105									
B0NVP3	N808014-01			0.021	1.00			54		768			16	08/18/98	08/19	SS-004
B0NVP4	N808014-02			0.045	1.00			50		768			16	08/18/98	08/19	SS-009
B0NVP5	N808014-03			0.016	1.00			74		768			16	08/18/98	08/19	SS-010
B0NVP6	N808014-04			0.018	1.00			68		768			16	08/18/98	08/19	SS-011
B0P2W8	N808014-05			0.017	1.00			68		768			16	08/18/98	08/19	SS-012
BLK (QC ID=28818)	N808014-07			0.016	1.00			72		768				08/18/98	08/19	SS-014
LCS (QC ID=28817)	N808014-06			0.015	1.00			76		768				08/18/98	08/19	SS-013
Duplicate (N808014-01) (QC ID=28819)	N808014-08			0.035	1.00			34		768			16	08/18/98	08/19	SS-015
Nominal values and limits from method				0.050	1.00			20-105		700	100		180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

Test AM	Matrix SOLID
SDG 7487	
Contact N. Joseph Verville	

METHOD SUMMARY, cont.

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG H0187	

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

AVERAGES ± 2 SD	MDA	0.023	±	0.022
FOR 8 SAMPLES	YIELD	62	±	29

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

Test PU Matrix SOLID
SDG 7487
Contact N. Joseph Verville

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0187

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238	Plutonium 239/240
Preparation batch 2785-105						
B0NVP3	N808014-01			7487-001	U	0.14
B0NVP4	N808014-02			7487-002	U	0.060
B0NVP5	N808014-03			7487-003	U	0.037 J
B0NVP6	N808014-04			7487-004	U	0.24
B0P2W8	N808014-05			7487-005	0.055 U	0.75
BLK (QC ID=28818)	N808014-07			7487-007	U	U
LCS (QC ID=28817)	N808014-06			7487-006	ok	ok
Duplicate (N808014-01)	N808014-08			7487-008	- U	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.050

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2785-105	2σ prep error 5.0 %				Reference Lab		Notebook #2785 pg. 105									
B0NVP3	N808014-01			0.054	1.00			27		1175			14	08/14/98	08/17	SS-035
B0NVP4	N808014-02			0.034	1.00			40		1175			14	08/14/98	08/17	SS-036
B0NVP5	N808014-03			0.025	1.00			69		1175			14	08/14/98	08/17	SS-037
B0NVP6	N808014-04			0.054	1.00			36		1175			14	08/14/98	08/17	SS-041
B0P2W8	N808014-05			0.056	1.00			21		1176			14	08/14/98	08/17	SS-043
BLK (QC ID=28818)	N808014-07			0.56	0.100			25		1042				08/14/98	08/17	SS-011
LCS (QC ID=28817)	N808014-06			0.18	0.100			60		1176				08/14/98	08/17	SS-044
Duplicate (N808014-01) (QC ID=28819)	N808014-08			0.034	1.00			26		1042			14	08/14/98	08/17	SS-012
Nominal values and limits from method				0.050	0.100			20-105		10	100		180			

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

Test PU	Matrix SOLID
SDG 7487	
Contact N. Joseph Verville	

METHOD SUMMARY, cont.

PLUTONIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG H0187	

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

AVERAGES ± 2 SD	MDA	0.12	±	0.37
FOR 8 SAMPLES	YIELD	38	±	35

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

Test U	Matrix SOLID
SDG 7487	
Contact N. Joseph Verville	

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG H0187	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1÷3	2σ	2÷3	2σ
Preparation batch 2785-105											
B0NVP3	N808014-01			7487-001	0.44	U	0.35	126	99	0	20
B0NVP4	N808014-02			7487-002	0.52	U	0.34	153	118	28	42
B0NVP5	N808014-03			7487-003	0.65	U	0.41	159	94	0	13
B0NVP6	N808014-04			7487-004	0.50	U	0.54	93	67	0	14
B0P2W8	N808014-05			7487-005	0.59	U	0.46	128	52	3	5
BLK (QC ID=28818)	N808014-07			7487-007	U	U	U				
LCS (QC ID=28817)	N808014-06			7487-006	ok	LOW	ok				
Duplicate (N808014-01)	N808014-08			7487-008	ok	- U	ok	92	53	0	9
Nominal values and limits from method				RDLs (pCi/g)	0.30	0.30	0.30	100		4	
							Averages	125		5	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2785-105 2σ prep error 5.0 % Reference Lab Notebook #2785 pg. 105																
B0NVP3	N808014-01			0.27	1.00			73		54			10	08/13/98	08/13	SS-035
B0NVP4	N808014-02			0.24	1.00			83		54			10	08/13/98	08/13	SS-036
B0NVP5	N808014-03			0.21	1.00			98		54			10	08/13/98	08/13	SS-037
B0NVP6	N808014-04			0.29	1.00			70		54			10	08/13/98	08/13	SS-038
B0P2W8	N808014-05			0.088	1.00			87		141			13	08/13/98	08/16	SS-035
BLK (QC ID=28818)	N808014-07			0.47	0.500			82		54				08/13/98	08/13	SS-045
LCS (QC ID=28817)	N808014-06			0.80	0.500			107		54				08/13/98	08/13	SS-044
Duplicate (N808014-01) (QC ID=28819)	N808014-08			0.20	1.00			96		54			10	08/13/98	08/13	SS-046
Nominal values and limits from method				0.30	0.500			30-105		150	100		180			

Lab id TMANC	
Protocol Hanford	
Version Ver 1.0	
Form DVD-CMS	
Version 3.06	
Report date 08/27/98	

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

Test	U
Matrix	SOLID
SDG	7487
Contact	N. Joseph Verville

METHOD SUMMARY, cont.

URANIUM, ISOTOPIC IN SOIL

ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Case no	SDG H0187

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

AVERAGES ± 2 SD	MDA	0.32	±	0.44
FOR 8 SAMPLES	YIELD	87	±	25

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

Test SR	Matrix SOLID
SDG 7487	
Contact N. Joseph Verville	

METHOD SUMMARY

STRONTIUM, TOTAL IN SOIL

BETA COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG H0187	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 2785-105					
B0NVP3	N808014-01			7487-001	2.1
B0NVP4	N808014-02			7487-002	0.92 J
B0NVP5	N808014-03			7487-003	0.86 J
B0NVP6	N808014-04			7487-004	4.5
B0P2W8	N808014-05			7487-005	66
BLK (QC ID=28818)	N808014-07			7487-007	U
LCS (QC ID=28817)	N808014-06			7487-006	ok
Duplicate (N808014-01)	N808014-08			7487-008	ok
Nominal values and limits from method				RDLs (pCi/g)	1.0

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2785-105	2σ prep error 10.0 %			Reference Lab	Notebook #2785 pg. 105											
B0NVP3	N808014-01			0.59	1.00			80		50			9	08/12/98	08/12	GRB-217
B0NVP4	N808014-02			0.50	1.00			86		50			9	08/12/98	08/12	GRB-218
B0NVP5	N808014-03			0.49	1.00			84		50			9	08/12/98	08/12	GRB-219
B0NVP6	N808014-04			0.53	1.00			85		50			9	08/12/98	08/12	GRB-206
B0P2W8	N808014-05			0.75	1.00			86		50			9	08/12/98	08/12	GRB-229
BLK (QC ID=28818)	N808014-07			5.2	0.100			80		50				08/12/98	08/12	GRB-232
LCS (QC ID=28817)	N808014-06			5.5	0.100			75		50				08/12/98	08/12	GRB-230
Duplicate (N808014-01) (QC ID=28819)	N808014-08			0.50	1.00			87		50			9	08/12/98	08/12	GRB-232
Nominal values and limits from method				1.0	0.100			20-105		150			180			

PROCEDURES	REFERENCE	SR8990
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-500	Strontium-89,90 - Purification, rev 0

AVERAGES ± 2 SD	MDA 1.8 ± 4.4
FOR 8 SAMPLES	YIELD 83 ± 8

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	08/27/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0187

Test GAM Matrix SOLID	Client Hanford
SDG 7487	Contract TRB-SBB-207925
Contact N. Joseph Verville	Case no SDG H0187

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 2785-105						
B0NVP3	N808014-01			7487-001	2.1	5.3
B0NVP4	N808014-02			7487-002	2.1	4.5
B0NVP5	N808014-03			7487-003	0.27	2.4
B0NVP6	N808014-04			7487-004	1.5	9.0
B0P2W8	N808014-05			7487-005	1.3	160
BLK (QC ID=28818)	N808014-07			7487-007	U	U
LCS (QC ID=28817)	N808014-06			7487-006	ok	ok
Duplicate (N808014-01)	N808014-08			7487-008	ok	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050	0.050

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2785-105	2σ prep error 15.0 % Reference Lab Notebook #2785 pg. 105															
B0NVP3	N808014-01			0.32	52.0					507			9	08/12/98	08/12	PD,01,00
B0NVP4	N808014-02			0.24	51.5					507			9	08/12/98	08/12	PD,03,00
B0NVP5	N808014-03			0.27	49.5					422			10	08/12/98	08/13	PD,01,00
B0NVP6	N808014-04			0.25	50.0					422			10	08/12/98	08/13	PD,03,00
B0P2W8	N808014-05			0.33	49.1					523			10	08/12/98	08/13	PD,01,00
BLK (QC ID=28818)	N808014-07			0.012	750					410				08/12/98	08/14	PD,01,00
LCS (QC ID=28817)	N808014-06			0.010	750					523				08/12/98	08/13	PD,03,00
Duplicate (N808014-01) (QC ID=28819)	N808014-08			0.28	52.0					410			11	08/12/98	08/14	PD,03,00
Nominal values and limits from method				0.050	750					100			180			

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

AVERAGES ± 2 SD FOR 8 SAMPLES			
MDA	0.21	±	0.26
YIELD		±	

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	08/27/98

SDG 7487
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0187

SAMPLE SUMMARY

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

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

The following notes apply to these reports:

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

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

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

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

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

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

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 08/27/98

SDG 7487
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0187

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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SAMPLE DELIVERY GROUP H0187

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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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REPORT GUIDE

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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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GUIDE, cont.

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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.

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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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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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Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
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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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REPORT GUIDE

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MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

* The first, computed limits for the recovery reflect:

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

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

  2. The error of ADDED.

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

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

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Contact N. Joseph Verville

GUIDE, cont.

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Contract TRB-SBB-207925
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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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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
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SDG 7487
Contact N. Joseph Verville

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METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

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

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

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METHOD SUMMARY

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

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

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

  MDAs are underlined if greater than the printed RDL.

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

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

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

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

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

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

METHOD SUMMARY

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

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

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

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

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

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

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

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

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

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

METHOD SUMMARY

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

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

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

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B98-087-23	Page 1 of 1 RJN 8/4/98

Collector Fahlberg/Nielson	**Company Contact** Steve Marske	**Telephone No.** 373-4316	**Project Coordinator** TRENT. SJ	**Data Turnaround** ~~21 Days~~ RJN 8/4/98 3 days
Project Designation 105-C Phase II - Verification Sampling - Concrete	**Sampling Location** 105-C		**SAF No.** B98-087	
Ice Chest No.	**Field Logbook No.** EL 1309-2		**Method of Shipment** Federal Express	
Shipped To RJN Thermo NuTech ~~Quanterra Incorporated~~ 8/4/98 Richmond Laboratory	**Offsite Property No.** A980029		**Bill of Lading/Air Bill No.**	
Waste Designation Client determined no waste codes associated with this project.			**COA**	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	Cool 4C	None	None							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	0	1	1	1							
Volume	60mL	60mL	60mL	60mL							

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	PCBs - 8080 (Aroclor-1254)	See item (1) in Special Instructions	ICP Metals - 6010A (Add-on) (Lead), Mercury - 7471 - (CV)						
B0NVP3	Other Solid	8-3-98	1235			X							B0NVX2
B0NVP4	Other Solid	8-3-98	1235			X							B0NVX2
B0NVP5	Other Solid	8-3-98	1253			X							B0NVX4
B0NVP6	Other Solid	8-3-98	1312			X							B0NVX5
B0P2W8	Other Solid	8-3-98	1337			X							B0P2Y2

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

Relinquished By	Date/Time	Received By	Date/Time
Renee Nielson R. Nielson	8/4/98 1300	Fed Ex	
		C. SANBALANG	8/4/98 1000

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium, Isotopic Uranium, Americium-241; Strontium-89,90 -- Total Sr

Matrix *

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

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

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 8/4/98 / 1000 S.G.#: _____

Work Order Number: 148-08-013-014 SAF #: _____

Shipping Container ID: 5 GAL. DRUM Chain of Custody # BP B98-087-23

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

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

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

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

Sample Custodian/Laboratory: [signature] / TNU Date: 8-5-98

Telephoned To: _____ On _____ By _____