H0516 TNU/HANFORD

RECRA ENVIRONMENTAL INC.

Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9909L007
SDG/SAF# : B99-078/H0516

W.O.# : 10985-001-001-9999-00
Date Received: 09-03-99

RECEIVED JAN 27 2000 EDMC

REVISION

METALS CASE NARRATIVE

This package has been revised to include the addition of Antimony and Thallium.

1. This narrative covers the analyses of 4 soil samples.

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

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

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

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

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

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

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

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

10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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 019 pages.

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

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B0W9L0	Antimony	500	108.3

12. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

11-11-99
Date

mld/m09-007r

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9909L007

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

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

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B		__200.7				__99
Antimony	✓6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	✓6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	✓6010B		__200.7				__99
Beryllium	✓6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	✓6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	__6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	__6010B		__200.7				__99
Copper	✓6010B	__7211 [5]	__200.7	__220.2			__99
Iron	__6010B		__200.7				__99
Lead	✓6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	__6010B		__200.7				__99
Manganese	__6010B		__200.7				__99
Mercury	✓7470A [3]	✓7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	✓6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	✓6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	✓6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	__6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	✓6010B	__7841 [5]	__200.7	__279.2__200.9			__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	✓6010B		__200.7				__99
Zinc	✓6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ **Method:**_____

L-WI-033/M-03/98

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

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

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

4. Flame AA.

5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

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INORGANICS DATA SUMMARY REPORT 11/11/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-008	B0W9L0	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Arsenic, Total	4.1	MG/KG	0.33	1.0
		Barium, Total	91.0	MG/KG	0.03	1.0
		Beryllium, Total	0.36	MG/KG	0.01	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	13.4	MG/KG	0.08	1.0
		Copper, Total	12.7	MG/KG	0.12	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Nickel, Total	11.2	MG/KG	0.12	1.0
		Lead, Total	6.6	MG/KG	0.21	1.0
		Antimony, Total	0.25 u	MG/KG	0.25	1.0
		Selenium, Total	0.57	MG/KG	0.37	1.0
		Thallium, Total	0.95	MG/KG	0.54	1.0
		Vanadium, Total	47.3	MG/KG	0.06	1.0
		Zinc, Total	46.0	MG/KG	0.08	1.0
-009	B0W9L1	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	15.6	MG/KG	0.30	1.0
		Barium, Total	140	MG/KG	0.03	1.0
		Beryllium, Total	0.49	MG/KG	0.009	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	14.7	MG/KG	0.07	1.0
		Copper, Total	19.5	MG/KG	0.11	1.0
		Mercury, Total	0.04	MG/KG	0.02	1.0
		Nickel, Total	14.1	MG/KG	0.11	1.0
		Lead, Total	9.2	MG/KG	0.19	1.0
		Antimony, Total	0.30	MG/KG	0.23	1.0
		Selenium, Total	0.86	MG/KG	0.34	1.0
		Thallium, Total	0.84	MG/KG	0.49	1.0
		Vanadium, Total	49.8	MG/KG	0.06	1.0
		Zinc, Total	46.7	MG/KG	0.07	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 11/11/99

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SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-010	B0W9L2	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	11.4	MG/KG	0.30	1.0
		Barium, Total	129	MG/KG	0.03	1.0
		Beryllium, Total	0.53	MG/KG	0.009	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	14.3	MG/KG	0.07	1.0
		Copper, Total	17.1	MG/KG	0.11	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Nickel, Total	14.5	MG/KG	0.11	1.0
		Lead, Total	10.6	MG/KG	0.19	1.0
		Antimony, Total	0.30	MG/KG	0.23	1.0
		Selenium, Total	0.71	MG/KG	0.34	1.0
		Thallium, Total	1.4	MG/KG	0.48	1.0
		Vanadium, Total	38.1	MG/KG	0.05	1.0
		Zinc, Total	50.2	MG/KG	0.07	1.0
-011	B0W9L3	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	10.8	MG/KG	0.29	1.0
		Barium, Total	97.7	MG/KG	0.03	1.0
		Beryllium, Total	0.51	MG/KG	0.009	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	13.9	MG/KG	0.07	1.0
		Copper, Total	16.2	MG/KG	0.11	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Nickel, Total	13.0	MG/KG	0.11	1.0
		Lead, Total	9.9	MG/KG	0.19	1.0
		Antimony, Total	0.22 u	MG/KG	0.22	1.0
		Selenium, Total	0.33 u	MG/KG	0.33	1.0
		Thallium, Total	1.2	MG/KG	0.47	1.0
		Vanadium, Total	44.7	MG/KG	0.05	1.0
		Zinc, Total	49.6	MG/KG	0.07	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/11/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0649-MB1	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Arsenic, Total	0.33 u	MG/KG	0.33	1.0
		Barium, Total	0.04	MG/KG	0.03	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.13	MG/KG	0.08	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Nickel, Total	0.13	MG/KG	0.12	1.0
		Lead, Total	0.37	MG/KG	0.21	1.0
		Antimony, Total	0.25 u	MG/KG	0.25	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Thallium, Total	0.53 u	MG/KG	0.53	1.0
		Vanadium, Total	0.06 u	MG/KG	0.06	1.0
		Zinc, Total	0.09	MG/KG	0.08	1.0
BLANK1	99C0278-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

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INORGANICS ACCURACY REPORT 11/11/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-008	B0W9L0	Silver, Total	4.1	0.10u	4.8	85.4	1.0
		Arsenic, Total	192	4.1	192	97.8	1.0
		Barium, Total	256	91.0	192	85.8	1.0
		Beryllium, Total	5.1	0.36	4.8	98.7	1.0
		Cadmium, Total	4.6	0.03u	4.8	95.8	1.0
		Chromium, Total	33.3	13.4	19.2	103.6	1.0
		Copper, Total	33.3	12.7	24.0	85.8	1.0
		Mercury, Total	0.20	0.03	0.17	98.8	1.0
		Nickel, Total	58.7	11.2	47.9	99.2	1.0
		Lead, Total	52.9	6.6	47.9	96.7	1.0
		Antimony, Total	24.1	0.25u	47.9	50.3	1.0
		Selenium, Total	182	0.57	192	94.5	1.0
		Thallium, Total	180	0.95	192	93.6	1.0
		Vanadium, Total	94.2	47.3	47.9	97.9	1.0
		Zinc, Total	91.2	46.0	47.9	94.4	1.0

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INORGANICS PRECISION REPORT 11/11/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-008REP	B0W9L0	Silver, Total	0.10u	0.08u	NC	1.0
		Arsenic, Total	4.1	3.9	5.0	1.0
		Barium, Total	91.0	88.4	2.9	1.0
		Beryllium, Total	0.36	0.35	2.6	1.0
		Cadmium, Total	0.03u	0.03u	NC	1.0
		Chromium, Total	13.4	13.8	2.9	1.0
		Copper, Total	12.7	12.1	4.8	1.0
		Mercury, Total	0.03	0.02	30.8	1.0
		Nickel, Total	11.2	11.6	3.5	1.0
		Lead, Total	6.6	6.5	1.5	1.0
		Antimony, Total	0.25u	0.21u	NC	1.0
		Selenium, Total	0.57	0.97	52.6	1.0
		Thallium, Total	0.95	1.2	22.8	1.0
		Vanadium, Total	47.3	48.1	1.7	1.0
		Zinc, Total	46.0	46.7	1.5	1.0

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INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/11/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0649-LC1	Silver, LCS	48.8	50.0	MG/KG	97.6
		Arsenic, LCS	954	1000	MG/KG	95.4
		Barium, LCS	489	500	MG/KG	97.7
		Beryllium, LCS	24.1	25.0	MG/KG	96.4
		Cadmium, LCS	23.9	25.0	MG/KG	95.6
		Chromium, LCS	49.0	50.0	MG/KG	98.0
		Copper, LCS	122	125	MG/KG	97.8
		Nickel, LCS	191	200	MG/KG	95.7
		Lead, LCS	238	250	MG/KG	95.1
		Antimony, LCS	286	300	MG/KG	95.3
		Selenium, LCS	926	1000	MG/KG	92.6
		Thallium, LCS	970	1000	MG/KG	97.0
		Vanadium, LCS	251	250	MG/KG	100.5
		Zinc, LCS	94.1	100	MG/KG	94.1
LCS1	99C0278-LC1	Mercury, LCS	1.1	1.0	MG/KG	109.5

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L007

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W9L0						
SILVER, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
SILVER, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
SILVER, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
ARSENIC, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
ARSENIC, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
ARSENIC, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
BARIUM, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
BARIUM, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
BARIUM, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
CADMIUM, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
CADMIUM, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
CADMIUM, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
CHROMIUM, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
CHROMIUM, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
CHROMIUM, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
COPPER, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
COPPER, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
COPPER, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
MERCURY, TOTAL	008	S	99C0278	09/02/99	09/24/99	09/27/99
MERCURY, TOTAL	008 REP	S	99C0278	09/02/99	09/24/99	09/27/99
MERCURY, TOTAL	008 MS	S	99C0278	09/02/99	09/24/99	09/27/99
NICKEL, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
NICKEL, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
NICKEL, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
LEAD, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
LEAD, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
LEAD, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
ANTIMONY, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
ANTIMONY, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
ANTIMONY, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
SELENIUM, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
SELENIUM, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L007

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
THALLIUM, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
THALLIUM, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
THALLIUM, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
VANADIUM, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
VANADIUM, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
VANADIUM, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
ZINC, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
ZINC, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
ZINC, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
B0W9L1						
SILVER, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
ARSENIC, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
BARIUM, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
CADMIUM, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
CHROMIUM, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
COPPER, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
MERCURY, TOTAL	009	S	99C0278	09/02/99	09/24/99	09/27/99
NICKEL, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
LEAD, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
ANTIMONY, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
SELENIUM, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
THALLIUM, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
VANADIUM, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
ZINC, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
B0W9L2						
SILVER, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
ARSENIC, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
BARIUM, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
CADMIUM, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
CHROMIUM, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
COPPER, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L007

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MERCURY, TOTAL	010	S	99C0278	09/02/99	09/24/99	09/27/99
NICKEL, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
LEAD, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
ANTIMONY, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
SELENIUM, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
THALLIUM, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
VANADIUM, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
ZINC, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
B0W9L3						
SILVER, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
ARSENIC, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
BARIUM, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
CADMIUM, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
CHROMIUM, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
COPPER, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
MERCURY, TOTAL	011	S	99C0278	09/02/99	09/24/99	09/27/99
NICKEL, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
LEAD, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
ANTIMONY, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
SELENIUM, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
THALLIUM, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
VANADIUM, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
ZINC, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99

LAB QC:

SILVER LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
SILVER, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
ARSENIC LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
ARSENIC, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
BARIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
BARIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
BERYLLIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
BERYLLIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
CADMIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L007

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CADMIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
CHROMIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
CHROMIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
COPPER LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
COPPER, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
MERCURY LABORATORY	LC1 BS	S	99C0278	N/A	09/24/99	09/27/99
MERCURY, TOTAL	MB1	S	99C0278	N/A	09/24/99	09/27/99
NICKEL LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
NICKEL, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
LEAD LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
LEAD, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
ANTIMONY LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
ANTIMONY, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
SELENIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
SELENIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
THALLIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
THALLIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
VANADIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
VANADIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
ZINC LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
ZINC, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99

RECRA LabNet Use Only
9909L007

Custody Transfer Record/Lab Work Request

Page 1 of 2

all FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS (8) ~~perchlorate~~ ~~wet lab~~ metals

RECRA LabNet

Client: TNU Hanford B99-078

Est. Final Proj. Sampling Date:

Project #: 21985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: O Johnson

QC: Spec Del: Std TAT: 30day

Date Rec'd: 9-3-99 Date Due: 10-3-99

Account #:

Refrigerator #								6			6	6			
#/Type Container	Liquid														
	Solid							1aq			1aq-1				
Volume	Liquid														
	Solid							120			500-1				
Preservatives															
ANALYSES REQUESTED →		ORGANIC						Hydrazine	INORG						
		VOA	BNA	Pest/PCB	Herb				Metal	CN					
								RECRA LabNet Use Only							
								HYZN			Met①	ICR6			

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	HYZN	Met①	ICR6
001	BOW9P9			S	9/1/99	0735	X		
002	BOW9R0						X		
003	BOW9R1						X		
004	BOW9R2						X		
005	BOW9R3						X		
006	BOW9R4						X		
007	BOW9R5						X		
008	BOW9L0				9/2/99	0915		X	✓
009	BOW9L1					0925		X	✓
010	BOW9L2					0934		X	✓

Special Instructions:

Hydrazine samples for MDL study

Saf# B99-078

COMPOSITE WASTE

DATE/REVISIONS:

1. Met① = As, Ba, Be, Cd, ~~Cr~~ Cr, Cu
2. Pb, Ni, Se, Ag, V, Zn, Hg
3. 9/15/99 001 → 007 cancelled - 99PM229
4.
5.

11/3/99 SB and TL added to all metals samples per client

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # *

2) Ambient or Chilled

3) Received in Good Condition Y or N

4) Labels Indicate Properly Preserved Y or N

5) Received Within Holding Times Y or N

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

2) Unbroken on Outer Package Y or N

3) Present on Sample Y or N

4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 2 °C

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: * 4235795 29057

Relinquished by	Received by	Date	Time
Fed Ex	D. Johnson	9/3/99	0930

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

510

RECRA LabNet Use Only
9909L007

Custody Transfer Record/Lab Work Request

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU - HANFORD B99-078 MSP 4-3-99

Est. Final Proj. Sampling Date:

Project #:

Project Contact/Phone #: Sel p 1

RECRA Project Manager:

QC: Del: TAT:

Date Rec'd: 9.3.99 Date Due:

Account #:

Refrigerator #																
#/Type Container	Liquid															
	Solid											lag				
Volume	Liquid															
	Solid															
Preservatives												500				
ANALYSES REQUESTED		ORGANIC: VOA	BNA	Pest/PCB	Herb			Hydrazine	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	VOA	BNA	Pest/PCB	Herb			Hydrazine	Metal	CN	Met(1)	ICR6				
011	BOW9L3			S	9/2/99	0944							✓ mjp 9-3-99			X	✓				

Special Instructions:

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	9/3/99	0930

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

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. ____ °C

See page 1

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-112	Page 1 of 2

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 CW1 C-P-12		SAF No.: B99-078
Ice Chest No.: ERC96-035	Field Logbook No.: EL-1511		Method of Shipment: ~~gov vehicle~~ RJN 9/2/99 Fed. Ex.
Shipped To: TMA/RECRA RECRA Cabinet	Offsite Property No.: A990243		Bill of Lading/Air Bill No.: 4235795290 57
			COA: B20CW1 671C

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C											
Type of Container	aG											
No. of Container(s)	1											
Volume	120mL											
SAMPLE ANALYSIS	Hydrazine - D1385											

	Sample No.	Matrix *	Sample Date	Sample Time										
1	B0W9P9	Soil	9-1-99	0735	X		3-4'						B0W8B7	
2	B0W9R0	Soil	9-1-99	0735	X									
3	B0W9R1	Soil	9-1-99	0735	X									
4	B0W9R2	Soil	9-1-99	0735	X									
5	B0W9R3	Soil	9-1-99	0735	X									

CHAIN OF POSSESSION	Sign/Print Names	Date/Time		Date/Time
Relinquished By	Doug Bowers	9-1-99 1200	Received By	RCF 1B 9-1-99 1200
Relinquished By	RCF #1B	9/2/99 1230	Received By	R. Nelson 9/2/99 1230
Relinquished By	R. Nelson	9/2/99 1330	Received By	Fed Ex
Relinquished By	Fed. Ex	9/3/99 0930	Received By	D. Smith 9/3/99 0930

SPECIAL INSTRUCTIONS
See chain of custody comments on SAF B99-078.
Collector unavailable to relinquish samples. RJN 9/2/99

Fed# 4235795290 57 temp. 2°

For Hydrazine MDL test

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By 99091L007	Date/Time

017

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-112	Page 2 of 2

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 CW1 6-P-1.2	SAF No.: B99-078	
Ice Chest No.: ERC96-035	Field Logbook No.: EL-1511	Method of Shipment: ~~gov vehicle~~ Fed. Ex	
Shipped To: TMA/RECRA RECRA labnet	Offsite Property No.: A990243	Bill of Lading/Air Bill No.: 4235795290057	
		COA: B20CW1 671C	

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C										
	Type of Container	aG										
Special Handling and/or Storage	No. of Container(s)	1										
	Volume	120mL										
SAMPLE ANALYSIS		Hydrazine - D1385										
Sample No.	Matrix *	Sample Date	Sample Time									
6 B0W9R4	Soil	9-1-99	0735	X		3-41				Bow887		
7 B0W9R5	Soil	9-1-99	0735	X		3-41				Bow887		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 9.1.99/1200	Received By: BoF 10	Date/Time: 9-1-99/1200
Relinquished By: REF # 1B 9/2/99	Date/Time: 1230	Received By: Renee Nielson/R. Nielson	Date/Time: 9/2/99
Relinquished By: Fed Ex	Date/Time: 9.3.99/0930	Received By: D. Smith	Date/Time: 9.3.99/0930
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
See chain of custody comments on SAF B99-078.
Collector unavailable to relinquish samples. RJN 9/2/99

For Hydrazine MDL test

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

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

018

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-108	Page 1 of 1 CB 9-2-99

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-11	SAF No.: B99-078	
Ice Chest No.: ERC96-035	Field Logbook No.: EL-1511	Method of Shipment: ~~gov vehicle~~ RJN 9/2/99 Fed Ex	
Shipped To: ~~TMA~~/RECRA CB 9-2-99	Offsite Property No.: A990243	Bill of Lading/Air Bill No.: 423579529057	
		COA: B20CW1 67/C	

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C	None									
	Type of Container	aG	aG									
	No. of Container(s)	1	1									
Special Handling and/or Storage	Volume	500mL	1000mL									
SAMPLE ANALYSIS		See item (1) in Special Instructions	See item (2) in Special Instructions									

	Sample No.	Matrix *	Sample Date	Sample Time										
8	B0W9L0	Soil	9-2-99	0915	X			4-5'		B0W5L8				
9	B0W9L1	Soil	9-2-99	0925	X			6.5'-7.5'		↓				
10	B0W9L2	Soil	9-2-99	0934	X			9'-10'		↓				
11	B0W9L3	Soil	9-2-99	0944	X			10'-11'		↓				
	~~B0W9L4~~	~~Soil~~	9/2/99 RJN											

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: Doug Bowers 9-2-99/1115	Received By: Ref 1B — Date/Time: 9-2-99/1115		
Relinquished By: Ref #1B 9/2/99 1230	Received By: [illegible] / R Nielson 9/2/99 1230		
Relinquished By: R Nielson / R. Nielson 9/2/99 1330	Received By: Fed Ex		
Relinquished By: Fed Ex 9.3.99/09:30	Received By: D. Smith 9.3.99/0930		

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

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

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

Collector unavailable for elmquish samples RJN 9/2/99

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

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

019

SDR # B00-010
Revision #: 0
Date Initiated: 10/11/99

SAMPLE DISPOSITION RECORD

SAF: B99-078
OU: 200-CW-1
Project ID: 200-CW-1
Task ID: 1
Sampling Event: 200 Area Source Characterization 200-CW-1 OU

Laboratory: TMA/RECRA

Task Manager: M.E. Todd

Sampling Information:
Number of Samples: 33
ID Numbers: See Attachment
Matrix: Soil
Collection Date: 08/31/99 - 09/07/99

Issue Background:

Class: ☐ Project Data Use ☒ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

Type: Addition of Analyses

Description: Perform Total Radioactive Strontium Analysis

Disposition:

Description: The 200-CW-1 Characterization project requested that the laboratory perform a total radioactive strontium analysis on the listed samples.

Justification: Total radioactive strontium data was determined to be needed subsequent to collection of the listed samples.

Approval Signatures:

S. J. Trent 10/11/99
Project Coordinator (Print/Sign Name) Date

M. E. Todd
Task Manager (Print/Sign Name) Date

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

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9909L007
SDG# : H0516
SAF# : B99-078

W.O. # : 10985-001-001-9999-00
Date Received: 09-03-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

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

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

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

5. The method blank for Chromium VI was within method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits.

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

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

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

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

9-30-99
Date

njp\i09-007

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages.

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

Recra LabNet Philadelphia

WET CHEMISTRY
METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	__		✓ ILMO4.0 (e)
% Volatile Soilids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygne Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		__ 9045C	
Sulfide, Reactive		__ Section 7.3	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Prpearation Leach		__ 1312	
Paint Filter		9095A	

Other: **Method:**

Other: **Method**

Recra LabNet Philadelphia
METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

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

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 09/28/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-008	B0W9L0	% Solids	90.7	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
-009	B0W9L1	% Solids	78.8	%	0.01	1.0
		Chromium VI	0.51 u	MG/KG	0.51	1.0
-010	B0W9L2	% Solids	78.1	%	0.01	1.0
		Chromium VI	0.51 u	MG/KG	0.51	1.0
-011	B0W9L3	% Solids	81.0	%	0.01	1.0
		Chromium VI	0.49 u	MG/KG	0.49	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/28/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVIA63-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 09/28/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-008	B0W9L0	Soluble Chromium VI	4.7	0.44u	4.4	108.3	1.0
		Insoluble Chromium VI	1460	0.44u	1280	114.9	100
BLANK10	99LVIA63-MB1	Soluble Chromium VI	3.9	0.40u	4.0	97.8	1.0
		Insoluble Chromium VI	1080	0.40u	1160	92.7	100

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 09/28/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-008REP	B0W9L0	Chromium VI	0.44u	0.44u	NC	1.0
-011REP	B0W9L3	% Solids	81.0	81.3	0.36	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L007

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W9L0						
% SOLIDS	008	S	99L%S125	09/02/99	09/10/99	09/10/99
CHROMIUM VI	008	S	99LVIA63	09/02/99	09/09/99	09/09/99
CHROMIUM VI	008 REP	S	99LVIA63	09/02/99	09/09/99	09/09/99
CHROMIUM VI	008 MS	S	99LVIA63	09/02/99	09/09/99	09/09/99
CHROMIUM VI	008 MSD	S	99LVIA63	09/02/99	09/09/99	09/09/99
B0W9L1						
% SOLIDS	009	S	99L%S125	09/02/99	09/10/99	09/10/99
CHROMIUM VI	009	S	99LVIA63	09/02/99	09/09/99	09/09/99
B0W9L2						
% SOLIDS	010	S	99L%S125	09/02/99	09/10/99	09/10/99
CHROMIUM VI	010	S	99LVIA63	09/02/99	09/09/99	09/09/99
B0W9L3						
% SOLIDS	011	S	99L%S125	09/02/99	09/10/99	09/10/99
% SOLIDS	011 REP	S	99L%S125	09/02/99	09/10/99	09/10/99
CHROMIUM VI	011	S	99LVIA63	09/02/99	09/09/99	09/09/99

LAB QC:

CHROMIUM VI	MB1	S	99LVIA63	N/A	09/09/99	09/09/99
CHROMIUM VI	MB1 BS	S	99LVIA63	N/A	09/09/99	09/09/99
CHROMIUM VI	MB1 BSD	S	99LVIA63	N/A	09/09/99	09/09/99

RECRA LabNet Use Only

9909L007 all

Custody Transfer Record/Lab Work Request

Page 1 of 2

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS (8) perrone wet lab

RECRA LabNet

Client: TNU Hanford B99-078

Est. Final Proj. Sampling Date:

Project #: 2985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: O Johnson

QC: Apec Del: Std TAT: 30day

Date Rec'd: 9-3-99 Date Due: 10-3-99

Account #:

Refrigerator #								6			6	6				000
#/Type Container	Liquid															
	Solid							1ag			1ag-1					
Volume	Liquid															
	Solid							120			500-1					
Preservatives																
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb			Hydrazine	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	#	1HYZN			Met(1)	1CR6				
001	BOW9P9			S	9/1/99	0735		X								
002	BOW9R0							X								
003	BOW9R1							X								
004	BOW9R2							X								
005	BOW9R3							X								
006	BOW9R4							X								
007	BOW9R5							X								
008	BOW9L0				9/2/99	0915					X	✓				
009	BOW9L1					0925					X	✓				
010	BOW9L2					0934					X	✓				

Special Instructions:

Hydrazine samples for MDL study

Saf# B99-078

COMPOSITE WASTE

DATE/REVISIONS:

1. Met(1) = As, Ba, Be, Cd, Cr, Cu
2. Pb, Ni, Se, Ag, V, Zn, Hg
3. # 9/15/99 001 → 007 cancelled - 99PM229
4.
5.

9-3-99

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # *

2) Ambient or Chilled

3) Received in Good Condition Y or N

4) Labels Indicate Properly Preserved Y or N

5) Received Within Holding Times Y or N

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

2) Unbroken on Outer Package Y or N

3) Present on Sample Y or N

4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 2 °C

Relinquished by	Received by	Date	Time
Fed Ex	D. Jones	9/3/99	0930

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: * 423579529057

RECRA LabNet Use Only

99091007

Custody Transfer Record/Lab Work Request

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNU - HANFORD B99-078 4-3-99

Est. Final Proj. Sampling Date

Project #

Project Contact/Phone # Sel p 1

RECRA Project Manager

QC Del TAT

Date Rec'd 9.3.99 Date Due

Account #

Refrigerator #																	010
#/Type Container	Liquid																
	Solid											1qg					
Volume	Liquid																
	Solid																
Preservatives												500					
ANALYSES REQUESTED →		ORGANIC							INORG								
		VOA	BNA	Pest/ PCB	Herb			Hydrazine	Metal	CN							
RECRA LabNet Use Only																	
												X Metal	✓ ICP6				

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
011	B0W9L3			S	9/2/99	0944

Special Instructions:

DATE/REVISIONS:

1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	9/3/99	0930

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. ___ °C

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-112	Page 1 of 2

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days		
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 CW1 GP-12		SAF No.: B99-078
Ice Chest No.: ERC96-035	Field Logbook No.: EL-1511		Method of Shipment: ~~gov vehicle~~ RJN 9/2/99 Fed. Ex.
Shipped To: TMA/RECRA RECRA labnet	Offsite Property No.: A990243		Bill of Lading/Air Bill No.: 423579529057
			COA B20CW1671C

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C										
	Type of Container	aG										
Special Handling and/or Storage	No. of Container(s)	1										
	Volume	120mL										
SAMPLE ANALYSIS		Hydrazine - D1385										

	Sample No.	Matrix *	Sample Date	Sample Time										
1	B0W9P9	Soil	9-1-99	0735	X		3-4'						B0W8B7	
2	B0W9R0	Soil	9-1-99	0735	X									
3	B0W9R1	Soil	9-1-99	0735	X									
4	B0W9R2	Soil	9-1-99	0735	X									
5	B0W9R3	Soil	9-1-99	0735	X									

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers / Doug Bowers	Date/Time: 9-1-99 / 1200	Received By: BCF 1B	Date/Time: 9-1-99 / 1200
Relinquished By: BCF #1B 9/2/99	Date/Time: 1230	Received By: R. Nelson / R. Nelson	Date/Time: 9/2/99 1230
Relinquished By: R. Nelson / R. Nelson	Date/Time: 9/2/99 1330	Received By: Fed EX	Date/Time:
Relinquished By: Fed. Ex	Date/Time: 9/3/99 / 0930	Received By: D. Smith	Date/Time: 9/3/99 / 0930

SPECIAL INSTRUCTIONS
See chain of custody comments on SAF B99-078.
Collector unavailable to relinquish samples. RJN 9/2/99

Fed# 423579529057 temp. 2°

For Hydrazine MDL test

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By: 99091L007	Date/Time

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-112	Page 2 of 2

Collector Bowers/Porter/Nielson	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ
Price Code 8N	Data Turnaround 45 Days		
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location 200 CW1 6 P-1.2		SAF No. B99-078
Ice Chest No. ERC 96-035	Field Logbook No. EL-1511		Method of Shipment ~~gov vehicle~~ Fed. Ex
Shipped To TMA/RECRA RECRA labonet	Offsite Property No. A9902243		Bill of Lading/Air Bill No. 4235795290057
			COA B20CW1 67JC

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C										
	Type of Container	aG										
Special Handling and/or Storage	No. of Container(s)	1										
	Volume	120mL										
SAMPLE ANALYSIS		Hydrazine - D1385										

	Sample No.	Matrix *	Sample Date	Sample Time									
6	B0W9R4	Soil	9-1-99	0735	X		3-41				Bow8R7		
7	B0W9R5	Soil	9-1-99	0735	X		3-41				Bow8R7		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Doug Bowers Doug Bowers 9-1-99/1200	Date/Time	Received By BgF 10 9-1-99/1200	Date/Time
Relinquished By REF # 1B 9/2/99 1230	Date/Time	Received By Renee Nielson/R. Nielson	Date/Time 9/2/99
Relinquished By Fed Ex 9.3.99/0930	Date/Time	Received By D. Smith 9.3.99/0930	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
See chain of custody comments on SAF B99-078.
Collector unavailable to relinquish samples. RJN 9/2/99

For Hydrazine MDL test

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-108	Page 1 of 21

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-11	SAF No.: B99-078	
Ice Chest No.: ERCGU-035	Field Logbook No.: EL-1511	Method of Shipment: ~~gov vehicle~~ RJN 9/2/99 Fed Exp	
Shipped To: ~~TMA~~/RECRA	Offsite Property No.: A9W0243	Bill of Lading/Air Bill No.: 423579529057	
		COA: B2BCW1 67/C	

POSSIBLE SAMPLE HAZARDS/REMARKS											
	Preservation	Cool 4C	None								
	Type of Container	aG	aG								
Special Handling and/or Storage	No. of Container(s)	1	1								
	Volume	500mL	1000mL								
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.								

	Sample No.	Matrix *	Sample Date	Sample Time										
8	B0W9L0	Soil	9-2-99	0915	X			4-5'		B0W9L8				
9	B0W9L1	Soil	9-2-99	0925	X			6.5'-7.5'						
10	B0W9L2	Soil	9-2-99	0934	X			9'-10'						
11	B0W9L3	Soil	9-2-99	0944	X			10'-11'						
	~~B0W9L4~~	Soil	9/2/99 RJN											

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: Doug Bowers 9-2-99/1115	Received By: RCF LB	Date/Time: 9-2-99/1115
Relinquished By: RCF #7B	Date/Time: 9/2/99 1230	Received By: R Nielson / R Nielson	Date/Time: 1230 9/2/99
Relinquished By: R Nielson / R. Nielson	Date/Time: 9/2/99 1330	Received By: Fed Ex	Date/Time:
Relinquished By: Fed Ex	Date/Time: 9.3.99/09:30	Received By: [signature]	Date/Time: 9.3.99/0930

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

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

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

Collector unavailable for relinquish samples RJN 9/2/99

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

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

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

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-078
RFW# : 9909L007
SDG/SAF# : B99-078/H0516

W.O.# : 10985-001-001-9999-00
Date Received: 09-03-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

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

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

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

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

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

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

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

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

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 19 pages.

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

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

10-1-99
Date

mld/m09-007

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9909L007

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 10/1/99	✓7470A [3]	✓7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	✓6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	✓6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	✓6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	__6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2__200.9			__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	✓6010B		__200.7				__99
Zinc	✓6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

L-WI-033/M-03/98

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

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

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

4. Flame AA.

5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-008	B0W9L0	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Arsenic, Total	4.1	MG/KG	0.33	1.0
		Barium, Total	91.0	MG/KG	0.03	1.0
		Beryllium, Total	0.36	MG/KG	0.01	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	13.4	MG/KG	0.08	1.0
		Copper, Total	12.7	MG/KG	0.12	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Nickel, Total	11.2	MG/KG	0.12	1.0
		Lead, Total	6.6	MG/KG	0.21	1.0
		Selenium, Total	0.57	MG/KG	0.37	1.0
		Vanadium, Total	47.3	MG/KG	0.06	1.0
		Zinc, Total	46.0	MG/KG	0.08	1.0
-009	B0W9L1	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	15.6	MG/KG	0.30	1.0
		Barium, Total	140	MG/KG	0.03	1.0
		Beryllium, Total	0.49	MG/KG	0.009	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	14.7	MG/KG	0.07	1.0
		Copper, Total	19.5	MG/KG	0.11	1.0
		Mercury, Total	0.04	MG/KG	0.02	1.0
		Nickel, Total	14.1	MG/KG	0.11	1.0
		Lead, Total	9.2	MG/KG	0.19	1.0
		Selenium, Total	0.86	MG/KG	0.34	1.0
		Vanadium, Total	49.8	MG/KG	0.06	1.0
		Zinc, Total	46.7	MG/KG	0.07	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-010	B0W9L2	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	11.4	MG/KG	0.30	1.0
		Barium, Total	129	MG/KG	0.03	1.0
		Beryllium, Total	0.53	MG/KG	0.009	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	14.3	MG/KG	0.07	1.0
		Copper, Total	17.1	MG/KG	0.11	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Nickel, Total	14.5	MG/KG	0.11	1.0
		Lead, Total	10.6	MG/KG	0.19	1.0
		Selenium, Total	0.71	MG/KG	0.34	1.0
		Vanadium, Total	38.1	MG/KG	0.05	1.0
		Zinc, Total	50.2	MG/KG	0.07	1.0
-011	B0W9L3	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	10.8	MG/KG	0.29	1.0
		Barium, Total	97.7	MG/KG	0.03	1.0
		Beryllium, Total	0.51	MG/KG	0.009	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	13.9	MG/KG	0.07	1.0
		Copper, Total	16.2	MG/KG	0.11	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Nickel, Total	13.0	MG/KG	0.11	1.0
		Lead, Total	9.9	MG/KG	0.19	1.0
		Selenium, Total	0.33 u	MG/KG	0.33	1.0
		Vanadium, Total	44.7	MG/KG	0.05	1.0
		Zinc, Total	49.6	MG/KG	0.07	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0649-MB1	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Arsenic, Total	0.33 u	MG/KG	0.33	1.0
		Barium, Total	0.04	MG/KG	0.03	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.13	MG/KG	0.08	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Nickel, Total	0.13	MG/KG	0.12	1.0
		Lead, Total	0.37	MG/KG	0.21	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Vanadium, Total	0.06 u	MG/KG	0.06	1.0
		Zinc, Total	0.09	MG/KG	0.08	1.0
BLANK1	99C0278-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-008	B0W9L0	Silver, Total	4.1	0.10u	4.8	85.4	1.0
		Arsenic, Total	192	4.1	192	97.8	1.0
		Barium, Total	256	91.0	192	85.8	1.0
		Beryllium, Total	5.1	0.36	4.8	98.7	1.0
		Cadmium, Total	4.6	0.03u	4.8	95.8	1.0
		Chromium, Total	33.3	13.4	19.2	103.6	1.0
		Copper, Total	33.3	12.7	24.0	85.8	1.0
		Mercury, Total	0.20	0.03	0.17	98.8	1.0
		Nickel, Total	58.7	11.2	47.9	99.2	1.0
		Lead, Total	52.9	6.6	47.9	96.7	1.0
		Selenium, Total	182	0.57	192	94.5	1.0
		Vanadium, Total	94.2	47.3	47.9	97.9	1.0
		Zinc, Total	91.2	46.0	47.9	94.4	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-008REP	B0W9L0	Silver, Total	0.10u	0.08u	NC	1.0
		Arsenic, Total	4.1	3.9	5.0	1.0
		Barium, Total	91.0	88.4	2.9	1.0
		Beryllium, Total	0.36	0.35	2.6	1.0
		Cadmium, Total	0.03u	0.03u	NC	1.0
		Chromium, Total	13.4	13.8	2.9	1.0
		Copper, Total	12.7	12.1	4.8	1.0
		Mercury, Total	0.03	0.02	30.8	1.0
		Nickel, Total	11.2	11.6	3.5	1.0
		Lead, Total	6.6	6.5	1.5	1.0
		Selenium, Total	0.57	0.97	52.6	1.0
		Vanadium, Total	47.3	48.1	1.7	1.0
		Zinc, Total	46.0	46.7	1.5	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/01/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0649-LC1	Silver, LCS	48.8	50.0	MG/KG	97.6
		Arsenic, LCS	954	1000	MG/KG	95.4
		Barium, LCS	489	500	MG/KG	97.7
		Beryllium, LCS	24.1	25.0	MG/KG	96.4
		Cadmium, LCS	23.9	25.0	MG/KG	95.6
		Chromium, LCS	49.0	50.0	MG/KG	98.0
		Copper, LCS	122	125	MG/KG	97.8
		Nickel, LCS	191	200	MG/KG	95.7
		Lead, LCS	238	250	MG/KG	95.1
		Selenium, LCS	926	1000	MG/KG	92.6
		Vanadium, LCS	251	250	MG/KG	100.5
		Zinc, LCS	94.1	100	MG/KG	94.1
LCS1	99C0278-LC1	Mercury, LCS	1.1	1.0	MG/KG	109.5

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L007

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W9L0						
SILVER, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
SILVER, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
SILVER, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
ARSENIC, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
ARSENIC, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
ARSENIC, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
BARIUM, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
BARIUM, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
BARIUM, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
CADMIUM, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
CADMIUM, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
CADMIUM, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
CHROMIUM, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
CHROMIUM, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
CHROMIUM, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
COPPER, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
COPPER, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
COPPER, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
MERCURY, TOTAL	008	S	99C0278	09/02/99	09/24/99	09/27/99
MERCURY, TOTAL	008 REP	S	99C0278	09/02/99	09/24/99	09/27/99
MERCURY, TOTAL	008 MS	S	99C0278	09/02/99	09/24/99	09/27/99
NICKEL, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
NICKEL, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
NICKEL, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
LEAD, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
LEAD, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
LEAD, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
SELENIUM, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
SELENIUM, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
SELENIUM, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
VANADIUM, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
VANADIUM, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L007

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
ZINC, TOTAL	008	S	99L0649	09/02/99	09/23/99	09/28/99
ZINC, TOTAL	008 REP	S	99L0649	09/02/99	09/23/99	09/28/99
ZINC, TOTAL	008 MS	S	99L0649	09/02/99	09/23/99	09/28/99
B0W9L1						
SILVER, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
ARSENIC, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
BARIUM, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
CADMIUM, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
CHROMIUM, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
COPPER, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
MERCURY, TOTAL	009	S	99C0278	09/02/99	09/24/99	09/27/99
NICKEL, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
LEAD, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
SELENIUM, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
VANADIUM, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
ZINC, TOTAL	009	S	99L0649	09/02/99	09/23/99	09/28/99
B0W9L2						
SILVER, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
ARSENIC, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
BARIUM, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
CADMIUM, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
CHROMIUM, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
COPPER, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
MERCURY, TOTAL	010	S	99C0278	09/02/99	09/24/99	09/27/99
NICKEL, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
LEAD, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
SELENIUM, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
VANADIUM, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
ZINC, TOTAL	010	S	99L0649	09/02/99	09/23/99	09/28/99
B0W9L3						
SILVER, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L007

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
BARIUM, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
BERYLLIUM, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
CADMIUM, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
CHROMIUM, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
COPPER, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
MERCURY, TOTAL	011	S	99C0278	09/02/99	09/24/99	09/27/99
NICKEL, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
LEAD, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
SELENIUM, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
VANADIUM, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99
ZINC, TOTAL	011	S	99L0649	09/02/99	09/23/99	09/28/99

LAB QC:

SILVER LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
SILVER, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
ARSENIC LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
ARSENIC, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
BARIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
BARIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
BERYLLIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
BERYLLIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
CADMIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
CADMIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
CHROMIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
CHROMIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
COPPER LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
COPPER, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
MERCURY LABORATORY	LC1 BS	S	99C0278	N/A	09/24/99	09/27/99
MERCURY, TOTAL	MB1	S	99C0278	N/A	09/24/99	09/27/99
NICKEL LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
NICKEL, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
LEAD LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
LEAD, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
SELENIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
SELENIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
VANADIUM LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-078

DATE RECEIVED: 09/03/99 RFW LOT # :9909L007

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99
ZINC LABORATORY	LC1 BS	S	99L0649	N/A	09/23/99	09/28/99
ZINC, TOTAL	MB1	S	99L0649	N/A	09/23/99	09/28/99

RECRA LabNet Use Only

9909L007 all

Custody Transfer Record/Lab Work Request

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU Hanford B99-078

Est. Final Proj. Sampling Date:

Project #: 01985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: O Johnson

QC: Apic Del: Std TAT: 30day

Date Rec'd: 9-3-99 Date Due: 10-3-99

Account #:

Refrigerator #								6			6	6			
#/Type Container	Liquid														
	Solid							1 jag			1 jag	1			
Volume	Liquid														
	Solid							120			500	1			
Preservatives															
ANALYSES REQUESTED →		ORGANIC						Hydrazine	INORG						
		VOA	BNA	Pest/PCB	Herb				Metal	CN					
		RECRA LabNet Use Only													
								1HYZN			Met①	1CR6			

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	1HYZN	Met①	1CR6
001	BOW9P9			S	9/1/99	0735	X		
002	BOW9R0						X		
003	BOW9R1						X		
004	BOW9R2						X		
005	BOW9R3						X		
006	BOW9R4						X		
007	BOW9R5						X		
008	BOW9L0				9/2/99	0915		X	✓
009	BOW9L1					0925		X	✓
010	BOW9L2					0934		X	✓

Special Instructions:

Hydrazine samples for MDL study

Saf # B99-078

COMPOSITE WASTE

DATE/REVISIONS:

1. Met① = As, Ba, Be, Cd, Cr, Cu
2. Pb, Ni, Se, Ag, V, Zn, Hg
3.
4.
5.

RECRA LabNet Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # *

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Labels Indicate Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

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

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 2 °C

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

NOTES: * 4235795290 57

Relinquished by	Received by	Date	Time
Fed Ex	D. Johnson	9/3/99	0930

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

01 CT

RECRA LabNet Use Only
9909L007

Custody Transfer Record/Lab Work Request

RECRA LabNet

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU - HANFORD B99-078 4-3-99

Est. Final Proj. Sampling Date:

Project #:

Project Contact/Phone #: Sel p 1

RECRA Project Manager:

QC: Del: TAT:

Date Rec'd: 9.3.99 Date Due:

Account #:

Refrigerator #																
#/Type Container	Liquid															
	Solid										lag					
Volume	Liquid															
	Solid															
Preservatives											500					
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb			Hydrazine	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																
011	BOW9L3			S	9/2/99	0944							✓			X	✓					

Hydrazine: mp 9-3-99

Met ①: X; ICR6: ✓

Special Instructions:

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	9/3/99	0930

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

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 C

See page 1

016

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-112	Page 1 of 2

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: 200 CW1 GP-12		SAF No.: B99-078	Data Turnaround: 45 Days
Ice Chest No.: ERC96-035	Field Logbook No.: EL-1511		Method of Shipment: ~~gov vehicle~~ RJN 9/2/99 Fed. Ex.	
Shipped To: TMA/RECRA RECRA labnet	Offsite Property No.: A990243		Bill of Lading/Air Bill No.: 423579529057	
			COA: B20CW1 671C	

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C										
	Type of Container	aG										
Special Handling and/or Storage	No. of Container(s)	1										
	Volume	120mL										
SAMPLE ANALYSIS		Hydrazine - D1385										

	Sample No.	Matrix *	Sample Date	Sample Time										
1	B0W9P9	Soil	9-1-99	0735	X		3-4'						B0W8B7	
2	B0W9R0	Soil	9-1-99	0735	X									
3	B0W9R1	Soil	9-1-99	0735	X									
4	B0W9R2	Soil	9-1-99	0735	X									
5	B0W9R3	Soil	9-1-99	0735	X									

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers / Doug Bowers	Date/Time: 9-1-99/1200	Received By: Ref 1B	Date/Time: 9-1-99/1200
Relinquished By: Ref # 1B	Date/Time: 9/2/99 1230	Received By: R. Nielson	Date/Time: 9/2/99 1230
Relinquished By: R. Nielson	Date/Time: 9/2/99 1330	Received By: Fed Ex	Date/Time:
Relinquished By: Fed. Ex	Date/Time: 9/3/99/0930	Received By: D. Smith	Date/Time: 9/3/99/0930

SPECIAL INSTRUCTIONS
See chain of custody comments on SAF B99-078.
Collector unavailable to relinquish samples. RJN 9/2/99
Fed# 423579529057 temp. 2°
For Hydrazine MDL test

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

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By: 99092007	Date/Time

017

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-112	Page 2 of 2

Collector Bowers/Porter/Nielson	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location 200 CW1 GP-12		SAF No. B99-078		
Ice Chest No. ERC96-035	Field Logbook No. EL-1511		Method of Shipment ~~gov vehicle~~ RJN 9/2/99 Fed. Ex		
Shipped To TMA/RECRA RECRA Labnet	Offsite Property No. A990243		Bill of Lading/Air Bill No. 423579529057		
			COA B20CW1 671C		

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C										
	Type of Container	aG										
Special Handling and/or Storage	No. of Container(s)	1										
	Volume	120mL										
SAMPLE ANALYSIS		Hydrazine - D1385										

	Sample No.	Matrix *	Sample Date	Sample Time									
6	B0W9R4	Soil	9-1-99	0735	X		3-41					B0W8R7	
7	B0W9R5	Soil	9-1-99	0735	X		3-41					B0W8R7	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By Doug Bowers Doug Bowers 9.1.99/1200	Received By BGF 10 9-1-99/1200		
Relinquished By REF # 1B 9/2/99 1230	Received By Renee Nielson/R. Nielson 9/2/99		
Relinquished By Fed Ex 9.3.99/0930	Received By D. Smith 9.3.99/0930		
Relinquished By	Received By		

SPECIAL INSTRUCTIONS
See chain of custody comments on SAF B99-078.
Collector unavailable to relinquish samples. RJN 9/2/99

For Hydrazine MDL test

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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

018

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-108	Page 1 of 1 CB 9-2-99

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-11	SAF No.: B99-078	
Ice Chest No.: ERC96-035	Field Logbook No.: EL-1511	Method of Shipment: ~~gov vehicle~~ RJN 9/2/99 Fed Ex	
Shipped To: ~~TMA~~/RECRA CB 9-2-99	Offsite Property No.: A990243	Bill of Lading/Air Bill No.: 423579529057	
		COA: B20CW167/C	

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	None								
	Type of Container	aG	aG								
	No. of Container(s)	1	1								
Special Handling and/or Storage	Volume	500mL	1000mL								
SAMPLE ANALYSIS		See item (1) in Special Instructions	See item (2) in Special Instructions								

	Sample No.	Matrix *	Sample Date	Sample Time										
8	B0W9L0	Soil	9-2-99	0915	X			4-5'		B0W5L8				
9	B0W9L1	Soil	9-2-99	0925	X			6.5'-7.5'						
10	B0W9L2	Soil	9-2-99	0934	X			9'-10'						
11	B0W9L3	Soil	9-2-99	0944	X			10'-11'						
	~~B0W9L4~~	~~Soil~~	9/2/99 RJN											

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers — Date/Time: Doug Bowers 9-2-99/1115	Received By: Ref 1B — Date/Time: 9-2-99/1115		
Relinquished By: Ref #1B 9/2/99 1230	Received By: [illegible] / R Nielson 9/2/99 1230		
Relinquished By: [illegible] / R. Nielson 9/2/99 1330	Received By: Fed Ex	Date/Time:	
Relinquished By: Fed Ex 9.3.99/09:30	Received By: [illegible] 9.3.99/0930	Date/Time:	

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

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

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

Collector unavailable for elmquish samples RJN 9/2/99

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

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

019

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0516 is composed of four solid (soil) samples designated under SAF No. B99-078 with a Project Designation of: 200 Area Source characterization-200-CW-1 OU.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist. The Gamma Scan results were reported to BHI via fax on October 22, 1999 while Total Strontium data was faxed to BHI on November 8, 1999.

2.0 ANALYSIS NOTES

2.1 Gamma Scan Analyses

No problems were encountered during the course of the analyses. A recount was performed on the duplicate.

2.1 Total Strontium Analyses

No problems were encountered during the course of the analyses. A recount was performed on sample B0W9L1.

NOV 1999
RECEIVED
Data
Log In

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

SAMPLE SUMMARY

SDG 7196
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0516

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
BOW9L0	GP-11	SOLID		N909036-01	B99-078	B99-078-108	09/02/99 09:15
BOW9L1	GP-11	SOLID		N909036-02	B99-078	B99-078-108	09/02/99 09:25
BOW9L2	GP-11	SOLID		N909036-03	B99-078	B99-078-108	09/02/99 09:34
BOW9L3	GP-11	SOLID		N909036-04	B99-078	B99-078-108	09/02/99 09:44
QC-DUP#1 32156		SOLID		N909036-11	B99-078		
Method Blank		SOLID		N909024-12	B99-078		
Method Blank		SOLID		N909036-06	B99-078		
Lab Control Sample		SOLID		N909024-11	B99-078		
Lab Control Sample		SOLID		N909036-05	B99-078		
Duplicate (N909036-01)	GP-11	SOLID		N909036-07	B99-078		09/02/99 09:15

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

QC SUMMARY

SDG 7196
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0516

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7193		Method Blank	SOLID						N909024-12	7193-012
		Lab Control Sample	SOLID						N909024-11	7193-011
7196		QC-DUP#1 32156	SOLID						N909036-11	7196-011
	B99-078-108	BOW9L0	SOLID	89.9			09/03/99	1	N909036-01	7196-001
		BOW9L1	SOLID	77.9			09/03/99	1	N909036-02	7196-002
		BOW9L2	SOLID	77.8			09/03/99	1	N909036-03	7196-003
		BOW9L3	SOLID	79.4			09/03/99	1	N909036-04	7196-004
		Method Blank	SOLID						N909036-06	7196-006
		Lab Control Sample	SOLID						N909036-05	7196-005
		Duplicate (N909036-01)	SOLID	89.9			09/03/99	1	N909036-07	7196-007

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

SDG 7196
Contact Kevin C. Johnson

PREP BATCH SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0516

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Beta Counting												
SR	SOLID	Total Strontium in Soil	6893-144	10.0	5			1	1			
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6893-151	15.0	4			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 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

WORK SUMMARY

SDG 7196
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0516

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
BOW9L0			N909036-01	7196-001	GAM		10/15/99	10/22/99	NJV	Gamma Scan
GP-11		SOLID	09/02/99	7196-001	SR		11/04/99	11/08/99	NJV	Total Strontium in Soil
B99-078-108	B99-078		09/03/99							
BOW9L1			N909036-02	7196-002	GAM		10/15/99	10/22/99	NJV	Gamma Scan
GP-11		SOLID	09/02/99	7196-002	SR		11/04/99	11/08/99	NJV	Total Strontium in Soil
B99-078-108	B99-078		09/03/99							
BOW9L2			N909036-03	7196-003	GAM		10/15/99	10/22/99	NJV	Gamma Scan
GP-11		SOLID	09/02/99	7196-003	SR		11/05/99	11/08/99	NJV	Total Strontium in Soil
B99-078-108	B99-078		09/03/99							
BOW9L3			N909036-04	7196-004	GAM		10/21/99	10/22/99	NJV	Gamma Scan
GP-11		SOLID	09/02/99	7196-004	SR		11/05/99	11/08/99	NJV	Total Strontium in Soil
B99-078-108	B99-078		09/03/99							
QC-DUP#1 32156			N909036-11	7196-011	SR		11/04/99	11/08/99	NJV	Total Strontium in Soil
		SOLID								
	B99-078									
Method Blank			N909024-12	7193-012	SR		11/04/99	11/08/99	NJV	Total Strontium in Soil
		SOLID								
	B99-078									
Method Blank			N909036-06	7196-006	GAM		10/16/99	10/22/99	NJV	Gamma Scan
		SOLID								
	B99-078									
Lab Control Sample			N909024-11	7193-011	SR		11/06/99	11/08/99	NJV	Total Strontium in Soil
		SOLID								
	B99-078									
Lab Control Sample			N909036-05	7196-005	GAM		10/21/99	10/22/99	NJV	Gamma Scan
		SOLID								
	B99-078									
Duplicate (N909036-01)			N909036-07	7196-007	GAM		10/19/99	10/22/99	NJV	Gamma Scan
GP-11		SOLID	09/02/99							
	B99-078		09/03/99							

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

SDG 7196
Contact Kevin C. Johnson

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0516

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
GAM	B99-078	Gamma Scan	GAMMAHI	4			1	1	1	7
SR	B99-078	Total Strontium in Soil	SRTOTAL	5			1	1		7
TOTALS				9			2	2	1	14

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

N909024-12 Method Blank

METHOD BLANK

SDG	7196	Client/Case no	Hanford	SDG-H0516	
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925		
Lab sample id	N909024-12	Client sample id	Method Blank		
Dept sample id	7193-012	Material/Matrix		SOLID	
		SAF No	B99-078		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	-0.053	0.096	0.17	1.0	U	SR

200 Area Source chrtzn 200-CW-1 OU

QC-BLANK 32148

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0516

N909036-06 Method Blank

METHOD BLANK

SDG	7196	Client/Case no	Hanford	SDG-H0516	
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925		
Lab sample id	N909036-06	Client sample id	Method Blank		
Dept sample id	7196-006	Material/Matrix		SOLID	
		SAF No	B99-078		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	U		0.14		U	GAM
Cobalt 60	10198-40-0	U		0.008	0.050	U	GAM
Cesium 137	10045-97-3	U		0.008	0.10	U	GAM
Europium 152	14683-23-9	U		0.021	0.10	U	GAM
Europium 154	15585-10-1	U		0.024	0.10	U	GAM
Europium 155	14391-16-3	U		0.029	0.10	U	GAM
Radium 226	13982-63-3	U		0.015	0.10	U	GAM
Radium 228	15262-20-1	U		0.045	0.20	U	GAM
Thorium 228	14274-82-9	U		0.012		U	GAM
Thorium 232	TH-232	U		0.045		U	GAM
Americium 241	14596-10-2	U		0.063		U	GAM
Uranium 238	U-238	U		1.1		U	GAM
Uranium 235	15117-96-1	U		0.033		U	GAM

200 Area Source chrtzn 200-CW-1 OU

QC-BLANK 31876

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

N909024-11 Lab Control Sample

LAB CONTROL SAMPLE

SDG	7196	Client/Case no	Hanford SDG-H0516
Contact	Kevin C. Johnson	Case no	TRB-SBB-207925
Lab sample id	N909024-11	Client sample id	Lab Control Sample
Dept sample id	7193-011	Material/Matrix	SOLID
		SAF No	B99-078

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Strontium	11.9	0.41	0.23	1.0		SR	10.9	0.44	109	82-118	

200 Area Source chrtzn 200-CW-1 OU

QC-LCS 32147

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-LCS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

N909036-05

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7196

Contact Kevin C. Johnson

Client/Case no Hanford SDG-H0516

Case no TRB-SBB-207925

Lab sample id N909036-05

Dept sample id 7196-005

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No B99-078

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
Cobalt 60	0.444	0.025	0.011	0.050		GAM	0.435	0.017	102	75-125	80-120
Cesium 137	0.491	0.024	0.016	0.10		GAM	0.447	0.018	110	73-127	80-120

200 Area Source chrtzn 200-CW-1 OU

QC-LCS 31875

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

N909036-07 BOW9L0

DUPLICATE

SDG	7196			Client/Case no	Hanford SDG-H0516
Contact	Kevin C. Johnson			Case no	TRB-SBB-207925
	DUPLICATE		ORIGINAL		
Lab sample id	N909036-07	Lab sample id	N909036-01	Client sample id	BOW9L0
Dept sample id	7196-007	Dept sample id	7196-001	Location/Matrix	GP-11 SOLID
		Received	09/03/99	Collected	09/02/99 09:15
% solids	89.9	% solids	89.9	Custody/SAF No	B99-078-108 B99-078

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Potassium 40	16.2	0.72	0.31			GAM	14.9	0.85	0.45		8	34	
Cobalt 60	U		0.036	0.050	U	GAM	U		0.044	U	-		
Cesium 137	0.133	0.038	0.041	0.10		GAM	0.121	0.037	0.042		9	70	
Europium 152	U		0.077	0.10	U	GAM	U		0.096	U	-		
Europium 154	U		0.12	0.10	U	GAM	U		0.13	U	-		
Europium 155	U		0.16	0.10	U	GAM	U		0.11	U	-		
Radium 226	0.764	0.069	0.065	0.10		GAM	0.709	0.067	0.063		7	37	
Radium 228	1.12	0.18	0.16	0.20		GAM	0.908	0.17	0.17		21	49	
Thorium 228	0.863	0.042	0.042			GAM	0.951	0.047	0.045		10	34	
Thorium 232	1.12	0.18	0.16			GAM	0.908	0.17	0.17		21	49	
Americium 241	U		0.29		U	GAM	U		0.16	U	-		
Uranium 238	U		4.0		U	GAM	U		4.8	U	-		
Uranium 235	U		0.14		U	GAM	U		0.15	U	-		

200 Area Source chrtzn 200-CW-1 OU

QC-DUP#1 31877

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

N909036-01 BOW9L0

DATA SHEET

SDG	7196	Client/Case no	Hanford SDG-H0516
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909036-01	Client sample id	BOW9L0
Dept sample id	7196-001	Location/Matrix	GP-11 SOLID
Received	09/03/99	Collected	09/02/99 09:15
% solids	89.9	Custody/SAF No	B99-078-108 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	-0.006	0.084	0.15	1.0	U	SR
Potassium 40	13966-00-2	14.9	0.85	0.45			GAM
Cobalt 60	10198-40-0	U		0.044	0.050	U	GAM
Cesium 137	10045-97-3	0.121	0.037	0.042	0.10		GAM
Europium 152	14683-23-9	U		0.096	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.11	0.10	U	GAM
Radium 226	13982-63-3	0.709	0.067	0.063	0.10		GAM
Radium 228	15262-20-1	0.908	0.17	0.17	0.20		GAM
Thorium 228	14274-82-9	0.951	0.047	0.045			GAM
Thorium 232	TH-232	0.908	0.17	0.17			GAM
Americium 241	14596-10-2	U		0.16		U	GAM
Uranium 238	U-238	U		4.8		U	GAM
Uranium 235	15117-96-1	U		0.15		U	GAM

200 Area Source chrtzn 200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

N909036-02 BOW9L1

DATA SHEET

SDG	7196	Client/Case no	Hanford	SDG-H0516	
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925		
Lab sample id	N909036-02	Client sample id	BOW9L1		
Dept sample id	7196-002	Location/Matrix	GP-11	SOLID	
Received	09/03/99	Collected	09/02/99 09:25		
% solids	77.9	Custody/SAF No	B99-078-108	B99-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	-0.048	0.079	0.11	1.0	U	SR
Potassium 40	13966-00-2	17.7	0.65	0.29			GAM
Cobalt 60	10198-40-0	U		0.030	0.050	U	GAM
Cesium 137	10045-97-3	0.022	0.019	0.025	0.10	U	GAM
Europium 152	14683-23-9	U		0.068	0.10	U	GAM
Europium 154	15585-10-1	U		0.098	0.10	U	GAM
Europium 155	14391-16-3	U		0.091	0.10	U	GAM
Radium 226	13982-63-3	0.854	0.062	0.055	0.10		GAM
Radium 228	15262-20-1	1.07	0.14	0.13	0.20		GAM
Thorium 228	14274-82-9	1.08	0.042	0.035			GAM
Thorium 232	TH-232	1.07	0.14	0.13			GAM
Americium 241	14596-10-2	U		0.089		U	GAM
Uranium 238	U-238	U		3.5		U	GAM
Uranium 235	15117-96-1	U		0.10		U	GAM

200 Area Source chrtzn 200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

N909036-03 BOW9L2

DATA SHEET

SDG	7196	Client/Case no	Hanford	SDG-H0516	
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925		
Lab sample id	N909036-03	Client sample id	BOW9L2		
Dept sample id	7196-003	Location/Matrix	GP-11	SOLID	
Received	09/03/99	Collected	09/02/99 09:34		
% solids	77.8	Custody/SAF No	B99-078-108	B99-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	2.20	0.16	0.12	1.0		SR
Potassium 40	13966-00-2	17.9	0.73	0.35			GAM
Cobalt 60	10198-40-0	U		0.033	0.050	U	GAM
Cesium 137	10045-97-3	U		0.034	0.10	U	GAM
Europium 152	14683-23-9	U		0.086	0.10	U	GAM
Europium 154	15585-10-1	U		0.12	0.10	U	GAM
Europium 155	14391-16-3	U		0.14	0.10	U	GAM
Radium 226	13982-63-3	0.948	0.072	0.068	0.10		GAM
Radium 228	15262-20-1	1.22	0.16	0.15	0.20		GAM
Thorium 228	14274-82-9	1.12	0.050	0.048			GAM
Thorium 232	TH-232	1.22	0.16	0.15			GAM
Americium 241	14596-10-2	U		0.32		U	GAM
Uranium 238	U-238	U		4.3		U	GAM
Uranium 235	15117-96-1	U		0.15		U	GAM

200 Area Source chrtzn 200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

N909036-04 BOW9L3

DATA SHEET

SDG	7196	Client/Case no	Hanford SDG-H0516
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925
Lab sample id	N909036-04	Client sample id	BOW9L3
Dept sample id	7196-004	Location/Matrix	GP-11 SOLID
Received	09/03/99	Collected	09/02/99 09:44
% solids	79.4	Custody/SAF No	B99-078-108 B99-078

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	2.26	0.17	0.13	1.0		SR
Potassium 40	13966-00-2	19.2	0.84	0.43			GAM
Cobalt 60	10198-40-0	U		0.036	0.050	U	GAM
Cesium 137	10045-97-3	U		0.036	0.10	U	GAM
Europium 152	14683-23-9	U		0.093	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.13	0.10	U	GAM
Radium 226	13982-63-3	0.972	0.086	0.077	0.10		GAM
Radium 228	15262-20-1	1.26	0.17	0.17	0.20		GAM
Thorium 228	14274-82-9	1.17	0.053	0.052			GAM
Thorium 232	TH-232	1.26	0.17	0.17			GAM
Americium 241	14596-10-2	U		0.33		U	GAM
Uranium 238	U-238	U		4.7		U	GAM
Uranium 235	15117-96-1	U		0.16		U	GAM

200 Area Source chrtzn 200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

N909036-11 QC-DUP#1 32156

DATA SHEET

SDG	7196	Client/Case no	Hanford	SDG-H0516	
Contact	Kevin C. Johnson	Contract	TRB-SBB-207925		
Lab sample id	N909036-11	Client sample id	QC-DUP#1 32156		
Dept sample id	7196-011	Location/Matrix		SOLID	
Received		Collected			
		Custody/SAF No		B99-078	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Total Strontium	SR-RAD	0.080	0.087	0.12	1.0	U	SR

200 Area Source chrtzn 200-CW-1 OU

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/08/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

Test SR	Matrix SOLID
SDG 7196	
Contact Kevin C. Johnson	

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Case no SDG-H0516	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 6893-144					
BOW9L0	N909036-01			7196-001	U
BOW9L1	N909036-02			7196-002	U
BOW9L2	N909036-03			7196-003	2.20
BOW9L3	N909036-04			7196-004	2.26
QC-DUP#1 32156	N909036-11			7196-011	U
BLK (QC ID=32148)	N909024-12			7193-012	U
LCS (QC ID=32147)	N909024-11			7193-011	ok

Nominal values and limits from method RDLs (pCi/g) 1.0

200 Area Source chrtzn 200-CW-1 OU

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6893-144	2σ prep error 10.0 % Reference Lab Notebook 6893 pg.144															
BOW9L0	N909036-01			0.15	1.05			88		200			63	11/01/99	11/04	GRB-218
BOW9L1	N909036-02			0.11	1.10			86		400			63	11/01/99	11/04	GRB-202
BOW9L2	N909036-03			0.12	1.05			86		400			64	11/01/99	11/05	GRB-203
BOW9L3	N909036-04			0.13	1.00			92		400			64	11/01/99	11/05	GRB-204
QC-DUP#1 32156	N909036-11			0.12	1.05			87		400				11/01/99	11/04	GRB-230
BLK (QC ID=32148)	N909024-12			0.17	1.04			72		200				11/01/99	11/04	GRB-217
LCS (QC ID=32147)	N909024-11			0.23	1.04			73		400				11/01/99	11/06	GRB-209
Nominal values and limits from method				1.0	1.02					100			180			

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

AVERAGES ± 2 SD	MDA	0.15	± 0.084
FOR 7 SAMPLES	YIELD	83	± 15

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

Test GAM Matrix SOLID
SDG 7196
Contact Kevin C. Johnson

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0516

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137
Preparation batch 6893-151							
BOW9L0	N909036-01			7196-001	U		0.121
BOW9L1	N909036-02			7196-002	U		U
BOW9L2	N909036-03			7196-003	U		U
BOW9L3	N909036-04			7196-004	U		U
BLK (QC ID=31876)	N909036-06			7196-006	U		U
LCS (QC ID=31875)	N909036-05			7196-005	ok		ok
Duplicate (N909036-01)	N909036-07			7196-007	-	U	ok
Nominal values and limits from method				RDLs (pCi/g)	0.050		0.10
200 Area Source chrtzn 200-CW-1 OU							

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6893-151 2σ prep error 15.0 % Reference Lab Notebook 6893 pg.151																
BOW9L0	N909036-01			0.11	647					226			43	09/24/99	10/15	02,03,00
BOW9L1	N909036-02			0.083	451					226			43	09/24/99	10/15	02,04,00
BOW9L2	N909036-03			0.095	614					226			43	09/24/99	10/15	MB,05,00
BOW9L3	N909036-04			0.11	592					206			49	09/24/99	10/21	MB,05,00
BLK (QC ID=31876)	N909036-06			0.015	575					681				09/24/99	10/16	MB,05,00
LCS (QC ID=31875)	N909036-05			0.011	575					498				09/24/99	10/21	MB,05,00
Duplicate (N909036-01) (QC ID=31877)	N909036-07			0.10	647					212			47	09/24/99	10/19	MB,05,00
Nominal values and limits from method				0.050	575					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 7 SAMPLES
MDA 0.075 ± 0.087
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 11/08/99

SDG 7196
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0516

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.

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
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Contact Kevin C. Johnson

Client Hanford
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Case no SDG-H0516

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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SDG 7196
Contact Kevin C. Johnson

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Client Hanford
Contract TRB-SBB-207925
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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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Contract TRB-SBB-207925
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DATA SHEET

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

The following notes apply to this report:

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

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

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

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

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

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

The following qualifiers are defined by the DVD system:

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

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DATA SHEET

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

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

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

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

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

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

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

P The RESULT is 'preliminary'.

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

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

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

The following values are underlined to indicate possible problems:

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

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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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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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GUIDE, cont.

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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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Contract TRB-SBB-207925
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MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

* The first, computed limits for the recovery reflect:

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

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

  2. The error of ADDED.

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

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

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GUIDE, cont.

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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.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 11/08/99

SDG 7196
Contact Kevin C. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0516

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.

SDG 7196
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0516

METHOD SUMMARY

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

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

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

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

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

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

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

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

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

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

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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	B99-078-108	Page 1 of 21 BXB 9-2-99

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-11		SAF No.: B99-078
Ice Chest No.: #2071	Field Logbook No.: EL-1511		Method of Shipment: ~~gov vehicle~~ SJS 9299 FED EX
Shipped To: TMA/~~RECRA~~ BXB 9-2-99	Offsite Property No.: A990244		Bill of Lading/Air Bill No.: 423579529068
			COA: B20CW167/C

Price Code: 8N SDG H0516

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C	None									
	Type of Container	aG	aG									
	No. of Container(s)	1	1									
Special Handling and/or Storage	Volume	500mL	1000mL									
SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions									

Sample No.	Matrix *	Sample Date	Sample Time										
B0W9L0	Soil	9-2-99	0915		X			4'-5'		B0W5L8			
B0W9L1	Soil	9-2-99	0925		X			6.5-7.5		↓			
B0W9L2	Soil	9-2-99	0934		X			9'-10'		↓			
B0W9L3	Soil	9-2-99	0944		X			10'-11'		↓			
~~B0W9L4~~ SJS 9299	~~Soil~~												

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: Doug Bowers 9-2-99/1115	Received By: Ref 1B	Date/Time: 9-2-99/1115
Relinquished By: REF 1B	Date/Time: 9299 1300	Received By: SJGALE SJSL	Date/Time: 9299 1300
Relinquished By: SJGALE SJSL	Date/Time: 9299 1300	Received By: FED EX	Date/Time: 9-2-99
Relinquished By: FedEx	Date/Time: 11:00 9-3-99	Received By: TNU McGoldenberg	Date/Time: 11:00 9-3-99

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

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

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

COLLECTOR UNAVAILABLE TO SIGN COC,

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

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

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc Date/Time received 9-3-99 11:00

CoC No. B 99-078-108

Container I.D. No. #2071 Requested TAT (Days) 45 P.O. Received Yes [ ] No [ ]

INSPECTION

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

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by M. Goldenberg Date: 9-3-99 Time: 11:00

LOGIN

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

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____