

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.

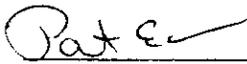
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 019 pages.

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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:

<u>Sample ID</u>	<u>Element</u>	<u>PDS</u> <u>Concentration (ppb)</u>	<u>PDS</u> <u>% Recovery</u>
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.

  
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J. Michael Taylor  
Vice President  
Philadelphia Analytical Laboratory

mld/m09-007r

11-11-99  
Date



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

Other: \_\_\_\_\_

Method: \_\_\_\_\_

# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

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

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

## ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LCS = Laboratory Control Sample.

NC = Not calculated.

## ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
4. Flame AA.
5. Graphite Furnace AA.

Recra LabNet - Lionville

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

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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	DILUTION
					LIMIT	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

007

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

RECRA LOT #: 9909L007

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-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	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
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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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
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

014





9909L007

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client <u>TNU - HANFORD</u> <sup>078</sup> <u>B 99-05</u> <u>4-3-A</u>	Refrigerator #																			
Est. Final Proj. Sampling Date	#/Type Container	Liquid																		
Project #		Solid																		
Project Contact/Phone # <u>see p 1</u>	Volume	Liquid																		
RECRA Project Manager		Solid																		
QC _____ Del _____ TAT _____	Preservatives																			
Date Rec'd <u>9.3.99</u> Date Due _____	ANALYSES REQUESTED →	ORGANIC					Hydrazine	INORG												
Account #		VOA	BNA	Pest/PCB	Herb			Metal	CN											

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only												
			MS	MSD																
			011	BOW9L3						S	9/2/99	0944								

Special Instructions:

DATE/REVISIONS:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

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

Relinquished by	Received by	Date	Time
<u>Eled Ex</u>	<u>D. J. Smith</u>	<u>9/3/99</u>	<u>0930</u>

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N \_\_\_\_\_

NOTES:

7/15

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											
Project Designation 200 Area Source characterization - 200-CW-1 OU		Sampling Location 200 CW1 <i>E-P-12</i>		SAF No. B99-078		Price Code <b>8N</b> Data Turnaround <b>45 Days</b>											
Ice Chest No. <i>ERC96035</i>		Field Logbook No. EL-1511		Method of Shipment <i>gov vehicle RIN 9/2/99 Fed. Ex.</i>													
Shipped To TMA/RECRA <i>RECRA cabinet</i>		Offsite Property No. <i>A990243</i>		Bill of Lading/Air Bill No. <i>423579529057</i>													
		COA <i>B20CW1671C</i>															
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 BOW9P9	Soil	9-1-99	0735	X													<i>Bow #07</i>
2 BOW9R0	Soil	9-1-99	0735	X													
3 BOW9R1	Soil	9-1-99	0735	X													
4 BOW9R2	Soil	9-1-99	0735	X													
5 BOW9R3	Soil	9-1-99	0735	X													
CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS See chain of custody comments on SAF B99-078. <i>Collector unavailable to relinquish samples. RIN 9/2/99</i>						Matrix *					
Relinquished By <i>Doug Bowers</i>		Date/Time <i>9-1-99/1200</i>		Received By <i>Bob</i>		Date/Time <i>9-1-99/1300</i>								Soil Water Vapor Other Solid Other Liquid			
Relinquished By <i>Ref # 1B9/2/99</i>		Date/Time <i>1230</i>		Received By <i>R. Nelson</i>		Date/Time <i>9/2/99</i>											
Relinquished By <i>R. Nelson</i>		Date/Time <i>9/2/99</i>		Received By <i>Fed Ex</i>		Date/Time											
Relinquished By <i>Fed. Ex</i>		Date/Time <i>9/3/99/0930</i>		Received By <i>D. J. Smith</i>		Date/Time <i>9/3/99/0930</i>											
LABORATORY SECTION		Received By				Title						Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method				Disposed By <i>9909L007</i>						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 <i>6-P-1.2</i>		SAF No. B99-078															
Ice Chest No. <i>ERC 96-035</i>		Field Logbook No. EL-1511		Method of Shipment <del>by vehicle</del> <i>Fed. Ex</i>															
Shipped To TMA/RECRA <i>RECEA cabinet</i>		Offsite Property No. <i>A990243</i>		Bill of Lading/Air Bill No. <i>423579529057</i>															
				COA <i>B20CW1671C</i>															
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																
B0W9R4	Soil	9-1-99	0735	X															<i>Row 8B7</i>
B0W9R5	Soil	9-1-99	0735	X															<i>Row 8B7</i>
CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS See chain of custody comments on SAF B99-078 <i>Collector unavailable to relinquish samples. RJN 9/2/99</i>						Matrix *							
Relinquished By <i>Doug Bowers</i>		Date/Time <i>9.1.99/1200</i>		Received By <i>RAF 10</i>		Date/Time <i>9-1-99/1200</i>								Soil					
Relinquished By <i>REF # 1B91299</i>		Date/Time <i>1230</i>		Received By <i>R. Nielson</i>		Date/Time <i>9/2/99</i>								Water					
Relinquished By <i>Red Ex</i>		Date/Time <i>9.3.99/0930</i>		Received By <i>D. J. Smith</i>		Date/Time <i>9.3.99/0930</i>								Vapor					
Relinquished By		Date/Time		Received By		Date/Time								Other Solid					
														Other Liquid					
LABORATORY SECTION		Received By				Title						Date/Time							
FINAL SAMPLE DISPOSITION		Disposal Method				Disposed By						Date/Time							

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Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-078-108		Page 1 of 2 879 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		Field Logbook No. EL-1511		SAF No. B99-078			
Ice Chest No. <i>ELCILE-035</i>		Offsite Property No. <i>A940243</i>		Method of Shipment <i>gov. vehicle - RN a/c/air Feed Cup</i>		Bill of Lading/Air Bill No. <i>423579529057</i>			
Shipped To TMA/RECRA <i>879 9-2-99</i>				COA <i>B20CWI 67/C</i>					
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						
BOW9L0	Soil	9-2-99	0915	X		4-5		Bow 5L8	
BOW9L1	Soil	9-2-99	0925	X		6.5-7.5			
BOW9L2	Soil	9-2-99	0934	X		9-10			
BOW9L3	Soil	9-2-99	0944	X		10-11		✓	
<del>BOW9L4</del>	<del>Soil</del>	<del>9/2/99</del>	<del></del>	<del></del>					
CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS			Matrix *
Relinquished By <i>Doug Bowers</i> Date/Time <i>9-2-99/1115</i>		Received By <i>Ref 1B</i> Date/Time <i>9-2-99/1115</i>				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) <i>Collector unavailable to reanalyze samples RN 9/2/99</i>			Soil Water Vapor Other Solid Other Liquid
Relinquished By <i>Ref #1B</i> Date/Time <i>9/2/99 1230</i>		Received By <i>Ref #1B/R. Nielson</i> Date/Time <i>9/2/99 1230</i>							
Relinquished By <i>R. Nielson</i> Date/Time <i>9/2/99 1330</i>		Received By <i>Feed Ex</i> Date/Time <i></i>							
Relinquished By <i>Feed Ex</i> Date/Time <i>9.3.99/09:30</i>		Received By <i>D. Spind</i> Date/Time <i>9.3.99/0930</i>							
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:**

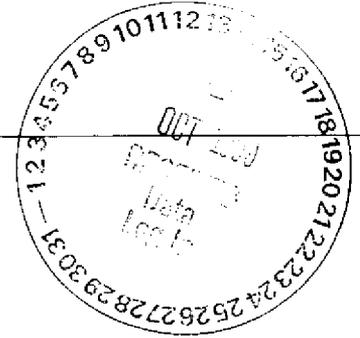
Description: The 200-CW-1 Characterization project requested that the laboratory perform a total radioactive strontium analysis on the listed samples.

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



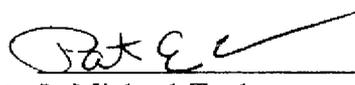
**Recra LabNet Philadelphia  
Analytical Report**

**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\09-007

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.

# Recra LabNet Philadelphia

## WET CHEMISTRY METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	<u>ASTM</u>	<u>SW846</u>	<u>OTHER</u>
% Ash	___ D2216-80		
% Moisture	___ D2216-80		___ ILMO4.0 (e)
% Solids	___		___ ✓ ILMO4.0 (e)
% Volatile Solids	___ D2216-80		
ASTM Extraction in Water	___ D3987-81/85		
BTU	___ D240-87		
CEC		___ 9081	___ c
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	
<b>Other:</b>	<b>Method:</b>		
<b>Other:</b>	<b>Method</b>		

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

RECRA LOT #: 9909L007

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

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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

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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			DILUTION FACTOR (RBP)
			RESULT	REPLICATE RPD		
-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
BOW9L0						
% 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
BOW9L1						
% 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
BOW9L2						
% 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
BOW9L3						
% 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







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 <i>OP-12</i>		SAF No. B99-078		
Ice Chest No. <i>ERC90-035</i>		Field Logbook No. EL-1511		Method of Shipment <del>by vehicle</del> <i>Fed. Ex</i>		
Shipped To TMA/RECRA <i>RECELABnet</i>		Offsite Property No. <i>A990243</i>		Bill of Lading/Air Bill No. <i>423579529057</i>		
COA <i>B20CW1671C</i>						

012

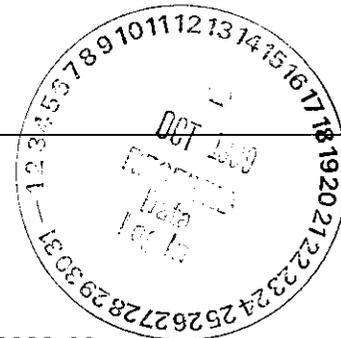
POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C																			
	Type of Container	aG																			
Special Handling and/or Storage	No. of Container(s)	1																			
	Volume	120mL																			
SAMPLE ANALYSIS		Hydrazine - D1385																			
Sample No.	Matrix *	Sample Date	Sample Time																		
6 BOW9R4	Soil	9-1-99	0735	X																	
7 BOW9R5	Soil	9-1-99	0735	X																	

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS See chain of custody comments on SAF B99-078. <i>Collector unavailable to relinquish samples. RSN 9/2/99</i>						Matrix * Soil Water Vapor Other Solid Other Liquid	
Relinquished By <i>Doug Bowers</i>	Date/Time <i>9.1.99/1200</i>	Received By <i>B.F. LO</i>	Date/Time <i>9.1.99/1200</i>										
Relinquished By <i>REF # 1B</i>	Date/Time <i>9/2/99 1230</i>	Received By <i>R. Nielson</i>	Date/Time <i>9/2/99</i>										
Relinquished By <i>Geo Ex</i>	Date/Time <i>9.3.99/0930</i>	Received By <i>D. Jones</i>	Date/Time <i>9.3.99/0930</i>										
Relinquished By	Date/Time	Received By	Date/Time										
LABORATORY SECTION	Received By	Title				For Hydrazine MOL test						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 2 089-2-99
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. ORCale-035		Field Logbook No. EL-1511		Method of Shipment gov. vehicle - RN a/2/99 Fed Ex		
Shipped To DCA/RECRA 089-2-99		Offsite Property No. A940243		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										
	Volume	500mL	1000mL										
Special Handling and/or Storage													
SAMPLE ANALYSIS				See item (1) in Special Instructions	See item (2) in Special Instructions								
Sample No.	Matrix *	Sample Date	Sample Time										
BOW9L0	Soil	9-2-99	0915	X			4-5'						BOW9L8
BOW9L1	Soil	9-2-99	0925	X			6.5-7.5'						
BOW9L2	Soil	9-2-99	0934	X			9-10'						
BOW9L3	Soil	9-2-99	0944	X			10'-11'						
<del>BOW9L4</del>	<del>Soil</del>	<del>9/2/99</del>	<del>1230</del>										

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *
Relinquished By Doug Bowers Date/Time 9-2-99/1115		Received By R.C.F. 1.B 9-2-99/1115		See chain of custody comments on SAF B99-078.				Soil Water Vapor Other Solid Other Liquid
Relinquished By REF #1B912FA 1230		Received By R.Nickel/R.Nickel 9/2/99		(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				
Relinquished By R. Nielson 9/2/99		Received By Fed Ex		(2) Gamma Spec - Complete (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)				
Relinquished By Fed Ex 9.3.99/09:30		Received By Dyprind 9.3.99/0930		Collector unavailable for re-mailing samples RN 9/2/99				
LABORATORY SECTION	Received By	Title						Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time		



**Recra LabNet Philadelphia  
Analytical Report**

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

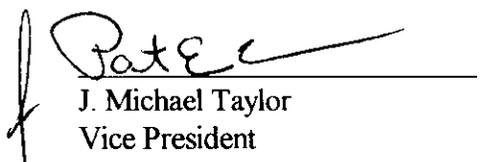
**W.O.# :** 10985-001-001-9999-00  
**Date Received:** 09-03-99

**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

mld/m09-007

10-1-99  
Date



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

Other: \_\_\_\_\_

Method: \_\_\_\_\_

# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

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

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

## ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LCS = Laboratory Control Sample.

NC = Not calculated.

## ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
4. Flame AA.
5. Graphite Furnace AA.

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	DILUTION
					LIMIT	FACTOR
-008	BOW9L0	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	BOW9L1	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	BOW9L2	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	BOW9L3	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	DILUTION
					LIMIT	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-MANFORD B99-078

RECRA LOT #: 9909L007

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION
			RESULT	REPLICATE	RPD	
-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	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
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
BOW9L0						
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
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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





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 <i>C-P-12</i>		SAF No. B99-078		
Ice Chest No. <i>ERC96-035</i>		Field Logbook No. EL-1511		Method of Shipment <del>gov vehicle</del> <i>RIN 9/2/99 Fed. Ex.</i>		
Shipped To TMA/RECRA <i>RECRA cabinet</i>		Offsite Property No. <i>A990243</i>		Bill of Lading/Air Bill No. <i>423579529057</i>		
		COA <i>B20CW1671C</i>				

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

Sample No.	Matrix *	Sample Date	Sample Time	Hydrazine - D1385																
1 B0W9P9	Soil	9-1-99	0735	X																Bow 817
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		SPECIAL INSTRUCTIONS See chain of custody comments on SAF B99-078. <i>Collector unavailable to relinquish samples. RIN 9/2/99</i>										Matrix *	
Relinquished By <i>Doug Bowers</i>	Date/Time <i>9-1-99/1200</i>	Received By <i>ACF</i>	Date/Time <i>9-1-99/1300</i>											Soil	
Relinquished By <i>Ref # 1B</i>	Date/Time <i>9/2/99 1230</i>	Received By <i>R. Nielson</i>	Date/Time <i>9/2/99</i>											Water	
Relinquished By <i>R. Nielson</i>	Date/Time <i>9/2/99 1330</i>	Received By <i>Fed Ex</i>	Date/Time											Vapor	
Relinquished By <i>Fed. Ex</i>	Date/Time <i>9/3/99/0930</i>	Received By <i>D. J. Smith</i>	Date/Time <i>9/3/99/0930</i>	For Hydrazine MDL test										Other Solid	
LABORATORY SECTION	Received By	Title										Date/Time			
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By <i>9909L007</i>										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 <i>OP-12</i>		SAF No. B99-078						
Ice Chest No. <i>ERC 96-035</i>		Field Logbook No. EL-1511		Method of Shipment <i>250/260 Fed. Ex</i>						
Shipped To TMA/RECRA <i>RECEA cabinet</i>		Offsite Property No. <i>A990243</i>		Bill of Lading/Air Bill No. <i>423579529057</i>						
				COA <i>B20CW1671C</i>						
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							
<i>6</i> B0W9R4	Soil	<i>9-1-99</i>	<i>0735</i>	<i>X</i>		<i>3-41</i>				<i>Row 4B7</i>
<i>7</i> B0W9R5	Soil	<i>9-1-99</i>	<i>0735</i>	<i>X</i>		<i>3-41</i>				<i>Row 4B7</i>
CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS See chain of custody comments on SAF B99-078.				Matrix *
Relinquished By <i>Doug Bowers</i> Date/Time <i>9.1.99/1200</i>		Received By <i>BoF 10</i> Date/Time <i>9-1-99/1200</i>		<i>Collector unavailable to relinquish samples. RSN 9/2/99</i>				Soil Water Vapor Other Solid Other Liquid		
Relinquished By <i>REF # 1B912PA</i> Date/Time <i>1230</i>		Received By <i>Gene Nielson/R. Nielson</i> Date/Time <i>9/2/99</i>								
Relinquished By <i>Head Ex</i> Date/Time <i>9.3.99/0930</i>		Received By <i>D. J. ...</i> Date/Time <i>9.3.99/0930</i>								
Relinquished By		Received By								
LABORATORY SECTION	Received By	Title				Date/Time				
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time				

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Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-078-108	Page 1 of 21 079 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. EL-CHE-035		Field Logbook No. EL-1511		Method of Shipment gov vehicle - RN a/c/a/r Feed Cup		
Shipped To TMA/RECRA 079 9-2-99		Offsite Property No. A960243		Bill of Lading/Air Bill No. 423579529057		
COA A 20 CWI 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						
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Sample No.	Matrix *	Sample Date	Sample Time							
BOW9L0	Soil	9-2-99	0915	X			4-5'			BOW 5L8
BOW9L1	Soil	9-2-99	0925	X			6.5-7.5'			
BOW9L2	Soil	9-2-99	0934	X			9-10'			
BOW9L3	Soil	9-2-99	0944	X			10'-11'			✓
<del>BOW9L4</del>	<del>Soil</del>	<del>9/2/99</del>	<del>1230</del>							

CHAIN OF POSSESSION		Sign/Print Names			SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By Doug Bowers Date/Time Doug Bowers 9-2-99/1115		Received By Rof RB 9-2-99/1115			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 reanalyze samples RN 9/2/99				Soil Water Vapor Other Solid Other Liquid	
Relinquished By Ref #1B 9/2/99 1230		Received By Rof RB 9/2/99 1230								
Relinquished By R. Nielson 9/2/99 1330		Received By Fed Ex								
Relinquished By Fed Ex 9.3.99/09:30		Received By Dyj 9.3.99/0930								
LABORATORY SECTION	Received By	Title							Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By				Date/Time		

019

**Case Narrative**

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**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.



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		CHAIN OF CUSTODY	COLLECTED
				SAMPLE ID	SAF NO		
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

SAMPLE SUMMARY

Page 1

SUMMARY DATA SECTION

Page 3

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

**TMA/RICHMOND**  
 SAMPLE DELIVERY GROUP H0516

SDG 7196  
 Contact Kevin C. Johnson

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

**QC SUMMARY**

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL SAMPLE ID	DEPARTMENT SAMPLE ID
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 ERROR		PLANCHETS ANALYZED				QUALI-	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
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

SDG 7196  
Contact Kevin C. Johnson

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

**WORK SUMMARY**

CLIENT SAMPLE ID		LAB SAMPLE ID			SUF-					
LOCATION	MATRIX	COLLECTED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
CUSTODY	SAF No	RECEIVED								
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								

WORK SUMMARY

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SUMMARY DATA SECTION

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

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

WORK SUMMARY, cont.

SDG 7196  
 Contact Kevin C. Johnson

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

ANALYTE	CAS NO	RESULT pCi/g	2 $\sigma$ 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
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Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>11/08/99</u>

**TMA / RICHMOND**  
**SAMPLE DELIVERY GROUP H0516**

N909036-06

Method Blank

**METHOD BLANK**

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

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 <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>11/08/99</u>

**TMA/RICHMOND**  
SAMPLE DELIVERY GROUP H0516

N909024-11

Lab Control Sample

**LAB CONTROL SAMPLE**

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

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ	LMTS	PROTOCOL
	pCi/g	{COUNT}	pCi/g	pCi/g	FIERS	TEST	pCi/g	pCi/g	%	{TOTAL}	LIMITS
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 <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>11/08/99</u>

**TMA/RICHMOND**  
SAMPLE DELIVERY GROUP H0516

N909036-05

Lab Control Sample

**LAB CONTROL SAMPLE**

SDG <u>7196</u> Contact <u>Kevin C. Johnson</u>	Client/Case no <u>Hanford</u> <span style="float: right;"><u>SDG-H0516</u></span> Case no <u>TRB-SBB-207925</u>
Lab sample id <u>N909036-05</u> Dept sample id <u>7196-005</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix <u>SOLID</u> SAF No <u>B99-078</u>

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ	LMTS	PROTOCOL
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS	TEST	pCi/g	%	(TOTAL)	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 <u>7196</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0516</u>
Contact <u>Kevin C. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N909036-07</u>	Lab sample id <u>N909036-01</u>	Client sample id <u>BOW9L0</u>
Dept sample id <u>7196-007</u>	Dept sample id <u>7196-001</u>	Location/Matrix <u>GP-11</u> <u>SOLID</u>
	Received <u>09/03/99</u>	Collected <u>09/02/99 09:15</u>
% solids <u>89.9</u>	% solids <u>89.9</u>	Custody/SAF No <u>B99-078-108</u> <u>B99-078</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIBERS	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		<u>0.12</u>	0.10	U	GAM	U		<u>0.13</u>	U	-		
Europium 155	U		<u>0.16</u>	0.10	U	GAM	U		<u>0.11</u>	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

DUPLICATES

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SUMMARY DATA SECTION

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

TMA / RICHMOND  
SAMPLE DELIVERY GROUP H0516

N909036-01

BOW9L0

DATA SHEET

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

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		<u>0.13</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.11</u>	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 <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>11/08/99</u>

TMA / RICHMOND  
SAMPLE DELIVERY GROUP H0516

N909036-02

BOW9L1

DATA SHEET

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

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 <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>11/08/99</u>

**TMA / RICHMOND**  
**SAMPLE DELIVERY GROUP H0516**

N909036-03

BOW9L2

**DATA SHEET**

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

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		<u>0.12</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.14</u>	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 <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>11/08/99</u>

**TMA / RICHMOND**  
**SAMPLE DELIVERY GROUP H0516**

N909036-04

BOW9L3

**DATA SHEET**

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

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		<u>0.13</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.13</u>	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 <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>11/08/99</u>

**TMA / RICHMOND**  
**SAMPLE DELIVERY GROUP H0516**

N909036-11

QC-DUP#1 32156

**DATA SHEET**

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

ANALYTE	CAS NO	RESULT pCi/g	2 $\sigma$ 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 <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>11/08/99</u>

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0516

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL  
BETA COUNTING

Test SR        Matrix SOLID  
SDG 7196  
Contact Kevin C. Johnson

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	ANAL- PREPARED	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	<u>1.00</u>			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

METHOD SUMMARIES

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TMA / RICHMOND  
SAMPLE DELIVERY GROUP H0516

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

TMA / RICHMOND  
SAMPLE DELIVERY GROUP H0516

SDG 7196  
Contact Kevin C. Johnson

REPORT GUIDE

Client Hanford  
Contract TRB-SBB-207925  
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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Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 11/08/99

TMA / RICHMOND  
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SDG 7196  
Contact Kevin C. Johnson

REPORT GUIDE

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

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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SAMPLE DELIVERY GROUP H0516

SDG 7196  
Contact Kevin C. Johnson

REPORT GUIDE

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

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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SDG 7196  
Contact Kevin C. Johnson

GUIDE, cont.

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

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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SUMMARY DATA SECTION

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TMA / RICHMOND  
SAMPLE DELIVERY GROUP H0516

SDG 7196  
Contact Kevin C. Johnson

GUIDE, cont.

Client Hanford  
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Case no SDG-H0516

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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TMA / RICHMOND  
SAMPLE DELIVERY GROUP H0516

SDG 7196  
Contact Kevin C. Johnson

REPORT GUIDE

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

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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REPORT GUIDE

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

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.

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

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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SDG 7196  
Contact Kevin C. Johnson

REPORT GUIDE

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

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

REPORT GUIDES

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TMA / RICHMOND  
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SDG 7196  
Contact Kevin C. Johnson

GUIDE, cont.

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Case no SDG-H0516

MATRIX SPIKE

for the recovery.

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

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

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Contact Kevin C. Johnson

REPORT GUIDE

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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SUMMARY DATA SECTION

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

TMA / RICHMOND  
SAMPLE DELIVERY GROUP H0516

SDG 7196  
Contact Kevin C. Johnson

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

- \* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- \* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.  
  
MDAs are underlined if greater than the printed RDL.
- \* Aliquots are underlined if less than the nominal value specified for the method.
- \* Preparation factors are underlined if greater than the nominal value specified for the method.
- \* Dilution factors are underlined if greater than the nominal value specified for the method.
- \* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- \* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- \* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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

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

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

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

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

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

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

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

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

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

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Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B99-078-108	Page 1 of 21 OXA 9-2-99
Collector Bowers/Porter/Nielson		Company Contact Chris Cearlock		Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 8N SDG 40516
Project Designation 200 Area Source characterization - 200-CW-1 OU		Sampling Location GP-11		SAF No. B99-078	Data Turnaround 45 Days	
Ice Chest No. #2071		Field Logbook No. EL-1511		Method of Shipment gov vehicle - 9299 FED EX		
Shipped To TMA/RECRA OXA 9-2-99		Offsite Property No. A990244		Bill of Lading/Air Bill No. 423579529068		
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							
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Sample No.	Matrix *	Sample Date	Sample Time									
BOW9L0	Soil	9-2-99	0915	X			4'-5'					BOW5L8
BOW9L1	Soil	9-2-99	0925	X			6.5'-7.5'					
BOW9L2	Soil	9-2-99	0934	X			9'-10'					
BOW9L3	Soil	9-2-99	0944	X			10'-11'					
BOW9L4	Soil											

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS See chain of custody comments on SAF B99-078.				Matrix *	
Relinquished By Doug Bowers	Date/Time 9-2-99/1115	Received By RAY IB	Date/Time 9-2-99/1115	(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,				Soil Water Vapor Other Solid Other Liquid	
Relinquished By REF IB	Date/Time 9299 1300	Received By SJOALS	Date/Time 9299 1300						
Relinquished By SJOALS	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 M. Goldenberg	Date/Time 11:00 9-3-99						
LABORATORY SECTION	Received By	Title						Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method			Disposed By				Date/Time	

V  
V  
V  
V

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT			
Client:	<u>Beechtel Hanford Inc</u>	Date/Time received	<u>9-3-99 11:00</u>
CoC No.	<u>B 99-078-108</u>		
Container I.D. No.	<u>#2071</u>	Requested TAT (Days)	<u>45</u> P.O. Received Yes [ ] No [ ]
INSPECTION			
1.	Custody seals on shipping container intact?	Yes [ <input checked="" type="checkbox"/> ]	No [ ] N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [ <input checked="" type="checkbox"/> ]	No [ ] N/A [ ]
3.	Custody seals on sample containers intact?	Yes [ <input checked="" type="checkbox"/> ]	No [ ] N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [ <input checked="" type="checkbox"/> ]	No [ ] N/A [ ]
5.	Cooler Temperature: _____	Packing material is:	Wet [ ] Dry [ <input checked="" type="checkbox"/> ]
6.	Number of samples in shipping container:	<u>4</u>	
7.	Number of containers per sample:	<u>1</u> (Or see CoC _____)	
8.	Paperwork agrees with samples?	Yes [ <input checked="" type="checkbox"/> ]	No [ ]
9.	Samples have:	Tape [ ] Hazard labels [ ] Rad labels [ <input checked="" type="checkbox"/> ] Appropriate sample labels [ <input checked="" type="checkbox"/> ]	
10.	Samples are:	In good condition [ <input checked="" type="checkbox"/> ] Leaking [ ] Broken Container [ ] Missing [ ]	
11.	Describe any anomalies: _____ _____ _____		
13.	Was P.M. notified of any anomalies?	Yes [ ]	No [ ] Date _____
14.	Received by	<u>M. Goldenberg</u>	Date: <u>9-3-99</u> Time: <u>11:00</u>
LOGIN			
TNU W.O. No.	Group No.	Client W.O. No.	
PROGRAM MANAGER			
Sample holding times exceeded?	Yes [ ]	No [ ]	
Client Notified: Name	_____		Date/time _____