0053031

RECRA ENVIRONMENTAL INC.

Chemical and Environmental Measurement Information

APR 2000 RECEIVED Data Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-031
RFW# : 0002L572
SDG/SAF# : H0760/B99-031

W.O.# : 10985-001-001-9999-00
Date Received: 02-26-00

RECEIVED APR 25 2000 EDMC

METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 water sample.

2. The sample was 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 16 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.

Pat E

for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

03-09-00
Date

mld/m02-572

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 00021572

Leaching Procedure: __1310 __1311 __1312 __Other:_____

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

Metals Digestion Methods: ✓3005A __3010A __3015 __3020A __3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B		__200.7				__99
Antimony	✓6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	✓6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	✓6010B		__200.7				__99
Beryllium	✓6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	✓6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	✓6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	✓6010B		__200.7				__99
Copper	✓6010B	__7211 [5]	__200.7	__220.2			__99
Iron	✓6010B		__200.7				__99
Lead	✓6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	✓6010B		__200.7				__99
Manganese	✓6010B		__200.7				__99
Mercury	✓7470A [3]	__7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	✓6010B		__200.7				__99
Potassium	✓6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	✓6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	✓6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	✓6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	✓6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	✓6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	✓6010B		__200.7				__99
Zinc	✓6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

L-WT-033/M-11/99

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

ANALYTICAL METAL METHODS

1. Not included in the method element list.

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

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

4. Flame AA.

5. Graphite Furnace AA.

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

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INORGANICS DATA SUMMARY REPORT 03/09/00

CLIENT: TMU-HANFORD B99-031 RECRA LOT #: 0002L572

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0XNY9	Silver, Total	0.90 u	UG/L	0.90	1.0
		Arsenic, Total	8.7	UG/L	2.9	1.0
		Barium, Total	18.3	UG/L	0.20	1.0
		Beryllium, Total	0.14	UG/L	0.10	1.0
		Calcium, Total	32100	UG/L	13.2	1.0
		Cadmium, Total	0.44	UG/L	0.30	1.0
		Cobalt, Total	10.4	UG/L	0.80	1.0
		Chromium, Total	7.1	UG/L	0.60	1.0
		Copper, Total	31.0	UG/L	0.80	1.0
		Iron, Total	4060	UG/L	14.6	1.0
		Mercury, Total	2.3	UG/L	0.10	1.0
		Potassium, Total	38600	UG/L	19.7	1.0
		Magnesium, Total	5740	UG/L	6.5	1.0
		Manganese, Total	193	UG/L	0.10	1.0
		Sodium, Total	164000	UG/L	26.6	1.0
		Nickel, Total	10.3	UG/L	1.4	1.0
		Lead, Total	21.6	UG/L	2.3	1.0
		Antimony, Total	7.7	UG/L	1.8	1.0
		Selenium, Total	4.4 u	UG/L	4.4	1.0
		Silicon, Total	4870	UG/L	5.1	1.0
		Thallium, Total	3.7 u	UG/L	3.7	1.0
		Vanadium, Total	1.2	UG/L	0.60	1.0
		Zinc, Total	52.1	UG/L	0.80	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/09/00

CLIENT: TMU-HANFORD B99-031 RECRA LOT #: 0002L572

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L1031-MB1	Silver, Total	0.90	u	UG/L	0.90	1.0
		Arsenic, Total	2.9	u	UG/L	2.9	1.0
		Barium, Total	0.52		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Calcium, Total	13.2	u	UG/L	13.2	1.0
		Cadmium, Total	0.30	u	UG/L	0.30	1.0
		Cobalt, Total	0.80	u	UG/L	0.80	1.0
		Chromium, Total	0.60	u	UG/L	0.60	1.0
		Copper, Total	0.80	u	UG/L	0.80	1.0
		Iron, Total	14.6	u	UG/L	14.6	1.0
		Potassium, Total	19.7	u	UG/L	19.7	1.0
		Magnesium, Total	6.5	u	UG/L	6.5	1.0
		Manganese, Total	0.10	u	UG/L	0.10	1.0
		Sodium, Total	26.6	u	UG/L	26.6	1.0
		Nickel, Total	1.4	u	UG/L	1.4	1.0
		Lead, Total	2.3	u	UG/L	2.3	1.0
		Antimony, Total	1.8	u	UG/L	1.8	1.0
		Selenium, Total	4.4	u	UG/L	4.4	1.0
		Silicon, Total	9.1		UG/L	5.1	1.0
		Thallium, Total	3.7	u	UG/L	3.7	1.0
		Vanadium, Total	0.60	u	UG/L	0.60	1.0
		Zinc, Total	1.1		UG/L	0.80	1.0
BLANK1	00C0061-MB1	Mercury, Total	0.10	u	UG/L	0.10	1.0

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INORGANICS ACCURACY REPORT 03/09/00

CLIENT: TNU-HANFORD B99-031 RECRA LOT #: 0002L572

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0XNY9	Silver, Total	50.9	0.90u	50.0	101.8	1.0
		Arsenic, Total	2030	8.7	2000	100.8	1.0
		Barium, Total	2030	18.3	2000	100.7	1.0
		Beryllium, Total	50.9	0.14	50.0	101.5	1.0
		Calcium, Total	56700	32100	25000	98.2	1.0
		Cadmium, Total	48.8	0.44	50.0	96.7	1.0
		Cobalt, Total	507	10.4	500	99.4	1.0
		Chromium, Total	208	7.1	200	100.2	1.0
		Copper, Total	290	31.0	250	103.5	1.0
		Iron, Total	5080	4060	1000	102.0*	1.0
		Mercury, Total	3.1	2.3	1.0	77.3	1.0
		Potassium, Total	66500	38600	25000	111.8	1.0
		Magnesium, Total	30300	5740	25000	98.4	1.0
		Manganese, Total	704	193	500	102.3	1.0
		Sodium, Total	189000	164000	25000	100.9*	1.0
		Nickel, Total	500	10.3	500	98.0	1.0
		Lead, Total	512	21.6	500	98.0	1.0
		Antimony, Total	511	7.7	500	100.6	1.0
		Selenium, Total	1990	4.4 u	2000	99.3	1.0
		Silicon, Total	6030	4870	1000	116.1*	1.0
		Thallium, Total	2000	3.7 u	2000	99.8	1.0
		Vanadium, Total	508	1.2	500	101.3	1.0
		Zinc, Total	548	52.1	500	99.2	1.0

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INORGANICS PRECISION REPORT 03/09/00

CLIENT: TNU-HANFORD B99-031 RECRA LOT #: 0002L572

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0XNY9	Silver, Total	0.90u	0.90u	NC	1.0
		Arsenic, Total	8.7	8.5	2.3	1.0
		Barium, Total	18.3	17.8	2.8	1.0
		Beryllium, Total	0.14	0.14	0.00	1.0
		Calcium, Total	32100	31400	2.4	1.0
		Cadmium, Total	0.44	0.64	37.0	1.0
		Cobalt, Total	10.4	10.5	0.96	1.0
		Chromium, Total	7.1	6.9	2.9	1.0
		Copper, Total	31.0	30.8	0.65	1.0
		Iron, Total	4060	3970	2.3	1.0
		Mercury, Total	2.3	2.2	3.2	1.0
		Potassium, Total	38600	37800	2.1	1.0
		Magnesium, Total	5740	5640	1.7	1.0
		Manganese, Total	193	188	2.6	1.0
		Sodium, Total	164000	160000	2.2	1.0
		Nickel, Total	10.3	11.2	8.4	1.0
		Lead, Total	21.6	21.8	0.92	1.0
		Antimony, Total	7.7	7.8	1.3	1.0
		Selenium, Total	4.4 u	4.4 u	NC	1.0
		Silicon, Total	4870	4750	2.5	1.0
		Thallium, Total	3.7 u	3.7 u	NC	1.0
		Vanadium, Total	1.2	1.5	22.2	1.0
		Zinc, Total	52.1	52.7	1.1	1.0

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INORGANICS LABORATORY CONTROL STANDARDS REPORT 03/09/00

CLIENT: TNU-HANFORD B99-031

RECRA LOT #: 0002L572

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L1031-LC1	Silver, LCS	486	500	UG/L	97.1
		Arsenic, LCS	9630	10000	UG/L	96.3
		Barium, LCS	4820	5000	UG/L	96.4
		Beryllium, LCS	244	250	UG/L	97.7
		Calcium, LCS	24600	25000	UG/L	98.4
		Cadmium, LCS	242	250	UG/L	96.6
		Cobalt, LCS	2410	2500	UG/L	96.4
		Chromium, LCS	488	500	UG/L	97.6
		Copper, LCS	1210	1250	UG/L	96.6
		Iron, LCS	4860	5000	UG/L	97.3
		Potassium, LCS	24500	25000	UG/L	98.0
		Magnesium, LCS	24200	25000	UG/L	96.6
		Manganese, LCS	748	750	UG/L	99.8
		Sodium, LCS	23500	25000	UG/L	94.1
		Nickel, LCS	1930	2000	UG/L	96.6
		Lead, LCS	2410	2500	UG/L	96.4
		Antimony, LCS	2860	3000	UG/L	95.5
		Selenium, LCS	9480	10000	UG/L	94.8
		Silicon, LCS	4970	5000	UG/L	99.3
		Thallium, LCS	9740	10000	UG/L	97.4
		Vanadium, LCS	2450	2500	UG/L	98.1
		Zinc, LCS	959	1000	UG/L	95.9
LCS1	00C0061-LC1	Mercury, LCS	5.2	5.0	UG/L	103.4

Recr LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
NU-HANFORD B99-031

DATE RECEIVED: 02/26/00 RFW LOT # :0002L572

CLIENT ID /ANALYSIS	RFW #		MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0XNY9							
SILVER, TOTAL	001		W	99L1031	02/2 /00	03/03/00	03/03/00
SILVER, TOTAL	001	REP	W	99L1031	02/2 /00	03/03/00	03/03/00
SILVER, TOTAL	001	MS	W	99L1031	02/2 /00	03/03/00	03/03/00
ARSENIC, TOTAL	001		W	99L1031	02/2 /00	03/03/00	03/03/00
ARSENIC, TOTAL	001	REP	W	99L1031	02/2 /00	03/03/00	03/03/00
ARSENIC, TOTAL	001	MS	W	99L1031	02/2 /00	03/03/00	03/03/00
BARIUM, TOTAL	001		W	99L1031	02/2 /00	03/03/00	03/03/00
BARIUM, TOTAL	001	REP	W	99L1031	02/2 /00	03/03/00	03/03/00
BARIUM, TOTAL	001	MS	W	99L1031	02/2 /00	03/03/00	03/03/00
BERYLLIUM, TOTAL	001		W	99L1031	02/2 /00	03/03/00	03/03/00
BERYLLIUM, TOTAL	001	REP	W	99L1031	02/2 /00	03/03/00	03/03/00
BERYLLIUM, TOTAL	001	MS	W	99L1031	02/2 /00	03/03/00	03/03/00
CALCIUM, TOTAL	001		W	99L1031	02/2 /00	03/03/00	03/03/00
CALCIUM, TOTAL	001	REP	W	99L1031	02/2 /00	03/03/00	03/03/00
CALCIUM, TOTAL	001	MS	W	99L1031	02/2 /00	03/03/00	03/03/00
CADMIUM, TOTAL	001		W	99L1031	02/2 /00	03/03/00	03/03/00
CADMIUM, TOTAL	001	REP	W	99L1031	02/2 /00	03/03/00	03/03/00
CADMIUM, TOTAL	001	MS	W	99L1031	02/2 /00	03/03/00	03/03/00
COBALT, TOTAL	001		W	99L1031	02/2 /00	03/03/00	03/03/00
COBALT, TOTAL	001	REP	W	99L1031	02/2 /00	03/03/00	03/03/00
COBALT, TOTAL	001	MS	W	99L1031	02/2 /00	03/03/00	03/03/00
CHROMIUM, TOTAL	001		W	99L1031	02/2 /00	03/03/00	03/03/00
CHROMIUM, TOTAL	001	REP	W	99L1031	02/2 /00	03/03/00	03/03/00
CHROMIUM, TOTAL	001	MS	W	99L1031	02/2 /00	03/03/00	03/03/00
COPPER, TOTAL	001		W	99L1031	02/2 /00	03/03/00	03/03/00
COPPER, TOTAL	001	REP	W	99L1031	02/2 /00	03/03/00	03/03/00
COPPER, TOTAL	001	MS	W	99L1031	02/2 /00	03/03/00	03/03/00
IRON, TOTAL	001		W	99L1031	02/2 /00	03/03/00	03/03/00
IRON, TOTAL	001	REP	W	99L1031	02/2 /00	03/03/00	03/03/00
IRON, TOTAL	001	MS	W	99L1031	02/2 /00	03/03/00	03/03/00
MERCURY, TOTAL	001		W	00C0061	02/2 /00	03/01/00	03/02/00
MERCURY, TOTAL	001	REP	W	00C0061	02/2 /00	03/01/00	03/02/00
MERCURY, TOTAL	001	MS	W	00C0061	02/2 /00	03/01/00	03/02/00
POTASSIUM, TOTAL	001		W	99L1031	02/2 /00	03/03/00	03/03/00
POTASSIUM, TOTAL	001	REP	W	99L1031	02/2 /00	03/03/00	03/03/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-031

DATE RECEIVED: 02/26/00 RFW LOT # :0002L572

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
POTASSIUM, TOTAL	001 MS	W	99L1031	02/24/00	03/03/00	03/03/00
MAGNESIUM, TOTAL	001	W	99L1031	02/24/00	03/03/00	03/03/00
MAGNESIUM, TOTAL	001 REP	W	99L1031	02/24/00	03/03/00	03/03/00
MAGNESIUM, TOTAL	001 MS	W	99L1031	02/24/00	03/03/00	03/03/00
MANGANESE, TOTAL	001	W	99L1031	02/24/00	03/03/00	03/03/00
MANGANESE, TOTAL	001 REP	W	99L1031	02/24/00	03/03/00	03/03/00
MANGANESE, TOTAL	001 MS	W	99L1031	02/24/00	03/03/00	03/03/00
SODIUM, TOTAL	001	W	99L1031	02/24/00	03/03/00	03/07/00
SODIUM, TOTAL	001 REP	W	99L1031	02/24/00	03/03/00	03/07/00
SODIUM, TOTAL	001 MS	W	99L1031	02/24/00	03/03/00	03/07/00
NICKEL, TOTAL	001	W	99L1031	02/24/00	03/03/00	03/03/00
NICKEL, TOTAL	001 REP	W	99L1031	02/24/00	03/03/00	03/03/00
NICKEL, TOTAL	001 MS	W	99L1031	02/24/00	03/03/00	03/03/00
LEAD, TOTAL	001	W	99L1031	02/24/00	03/03/00	03/03/00
LEAD, TOTAL	001 REP	W	99L1031	02/24/00	03/03/00	03/03/00
LEAD, TOTAL	001 MS	W	99L1031	02/24/00	03/03/00	03/03/00
ANTIMONY, TOTAL	001	W	99L1031	02/24/00	03/03/00	03/03/00
ANTIMONY, TOTAL	001 REP	W	99L1031	02/24/00	03/03/00	03/03/00
ANTIMONY, TOTAL	001 MS	W	99L1031	02/24/00	03/03/00	03/03/00
SELENIUM, TOTAL	001	W	99L1031	02/24/00	03/03/00	03/03/00
SELENIUM, TOTAL	001 REP	W	99L1031	02/24/00	03/03/00	03/03/00
SELENIUM, TOTAL	001 MS	W	99L1031	02/24/00	03/03/00	03/03/00
SILICON, TOTAL	001	W	99L1031	02/24/00	03/03/00	03/03/00
SILICON, TOTAL	001 REP	W	99L1031	02/24/00	03/03/00	03/03/00
SILICON, TOTAL	001 MS	W	99L1031	02/24/00	03/03/00	03/03/00
THALLIUM, TOTAL	001	W	99L1031	02/24/00	03/03/00	03/03/00
THALLIUM, TOTAL	001 REP	W	99L1031	02/24/00	03/03/00	03/03/00
THALLIUM, TOTAL	001 MS	W	99L1031	02/24/00	03/03/00	03/03/00
VANADIUM, TOTAL	001	W	99L1031	02/24/00	03/03/00	03/03/00
VANADIUM, TOTAL	001 REP	W	99L1031	02/24/00	03/03/00	03/03/00
VANADIUM, TOTAL	001 MS	W	99L1031	02/24/00	03/03/00	03/03/00
ZINC, TOTAL	001	W	99L1031	02/24/00	03/03/00	03/03/00
ZINC, TOTAL	001 REP	W	99L1031	02/24/00	03/03/00	03/03/00
ZINC, TOTAL	001 MS	W	99L1031	02/24/00	03/03/00	03/03/00

LAB QC:

SILVER LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-031

DATE RECEIVED: 02/26/00 RFW LOT # :0002L572

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SILVER, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
ARSENIC LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
ARSENIC, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
BARIUM LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
BARIUM, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
BERYLLIUM LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
BERYLLIUM, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
CALCIUM LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
CALCIUM, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
CADMIUM LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
CADMIUM, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
COBALT LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
COBALT, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
CHROMIUM LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
CHROMIUM, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
COPPER LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
COPPER, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
IRON LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
IRON, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
MERCURY LABORATORY	LC1 BS	W	00C0061	N/A	03/01/00	03/02/00
MERCURY, TOTAL	MB1	W	00C0061	N/A	03/01/00	03/02/00
POTASSIUM LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
POTASSIUM, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
MAGNESIUM LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
MAGNESIUM, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
MANGANESE LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
MANGANESE, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
SODIUM LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
SODIUM, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
NICKEL LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
NICKEL, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
LEAD LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
LEAD, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
ANTIMONY LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
ANTIMONY, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
SELENIUM LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
SELENIUM, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
SILICON LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-031

DATE RECEIVED: 02/26/00 RFW LOT # :0002L572

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SILICON, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
THALLIUM LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
THALLIUM, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
VANADIUM LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
VANADIUM, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00
ZINC LABORATORY	LC1 BS	W	99L1031	N/A	03/03/00	03/03/00
ZINC, TOTAL	MB1	W	99L1031	N/A	03/03/00	03/03/00

RECRA LabNet Use Only

00021572

Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client: TMU-Hanford B99-031

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: aj

QC: Spec Del: Std TAT: 15 21 days

Date Rec'd: 2-26-00 Date Due: 3-12-00

Account #:

Refrigerator #			5					5		5							
#/Type Container	Liquid		3aq					1P		1P							
	Solid																
Volume	Liquid		1L					500		500							
	Solid																
Preservatives			—					HNO_3		HNO_3							
ANALYSES REQUESTED →			ORGANIC					INORG									
			VOA	BNA	Pest/PCB	Herb		ICP Metal	CN	Mercury							
								RECRA LabNet Use Only									
					OPCB			Met (1)		Mercury							

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	OPCB	Met (1)	Mercury
001	BOXNY9	X	X	W	2/24/00	1130	X	X	X

Special Instructions:

Saf B99-031

DATE/REVISIONS:

1. Run matrix QC on #001
2. Met (1) Fe, Pb, Mg, Mn, Ni, K, Ag, Na, Sb, Ba
3. Be, Cd, Cr, Co, Cu, V, Zn, Ca, As, Se, Si
4. Tl
5.
6.

COMPOSITE WASTE

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. 3.1 °C

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

NOTES:

4235 7953 4104

Relinquished by	Received by	Date	Time
FedEx	[illegible]	2/26/00	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

011

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-01	Page 1 of 2

Collector: Fahlberg	Company Contact: J Adler — Telephone No.: 373-4316	Project Coordinator: TRENT, SJ	Price Code: 7L — Data Turnaround: 21 Days
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105DR	SAF No.: B99-031	Air Quality ☐
Ice Chest No.: ERC 99 ~~055041~~ RT 235 00	Field Logbook No.: EL 1424 — COA: R105D02F0C	Method of Shipment: Fed EX	
Shipped To: TMA/RECRA RECRA	Offsite Property No.: ~~AD00101~~ RT 235 00 AD00116	Bill of Lading/Air Bill No.: 42357953 4104	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

SAMPLE ANALYSIS

			Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HCl to pH <2	HNO3 to pH <2	HNO3 to pH <2	None	HNO3 to pH <2	HNO3 to pH <2
			Type of Container	~~P~~	P	P	P	P	P	P	P	P	P
			No. of Container(s)	~~1~~	1	1	1	1	1	1	1	2	2
			Volume	~~500mL~~	500mL	500mL	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	1000mL
				Tritium - H3	Mercury - 7470 - (CV)	See item (1) in Special Instructions.	Total Uranium	Technetium-99	See item (2) in Special Instructions.	Nickel-63	Carbon-14	Isotopic Plutonium; Radium -226; Americium-241/Curium-244	Strontium-89,90 – Total Sr
Sample No.	Matrix *	Sample Date	Sample Time										
~~B0XNY9~~	Water	~~1130~~											
B0XNY9	water	2-24-00	1130		X	X					TICTO B0XP00		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	1450 2-24-00	R. Thoren / R Thoren	1450 2.24.00 / 1415
R. Thoren / R Thoren	2.25.00/1430	FED EX	
Fed Ex	2.26.00/0930	D. Yonce	2.26.00/0930

SPECIAL INSTRUCTIONS

** Close SDG upon receipt of samples.

(1) ICP Metals - 6010A (TAL); ICP Metals - 6010A (Add-on) (Arsenic, Lead, Selenium, Silicon, Thallium)

~~(2) Gamma Spectroscopy (Water) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Antimony-125, Cesium-134)~~

2.24.00

1-A

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

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

BHI-EE-011 (10/99)

00021572

temp. 3.1°

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-01	Page 2 of 2

Collector: Fahlberg	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Price Code: 7L	Data Turnaround: 21 Days	Air Quality: ☐	
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105DR	SAF No.: B99-031	
Ice Chest No.: ERC 99 ~~053~~041 RT 2-25-00	Field Logbook No.: EL 1424	COA: R105D02F0C	Method of Shipment: Fed EX
Shipped To: TMA/RECRA RECRA	Offsite Property No.: ~~A00101~~ A00116 RT 2-25-00	Bill of Lading/Air Bill No.: 4235 7953 4104	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cooled to 4C											
Type of Container	aG											
No. of Container(s)	3											
Volume	1000mL											
SAMPLE ANALYSIS	PCBs - 8082										TIC	TO

Sample No.	Matrix *	Sample Date	Sample Time										
B0XNY9	Water	2-24-00	1130	X								BOXPPP	

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By: R Fahlberg / R Fahlberg — Date/Time: 1450 2-24-00	Received By: R. Thoren — Date/Time: R Thoren 2-24-00/1450	** Close SDG upon receipt of samples.	S=Soil, SE=Sediment, SO=Solid, S=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other
Relinquished By: R. Thoren — Date/Time: R. Thoren 2-25-00/1400	Received By: FED EX — Date/Time:		
Relinquished By: Fed Ex — Date/Time: 2-26-00/0930	Received By: [signature] — Date/Time: 2-26-00/0930		
Relinquished By: — Date/Time:	Received By: — Date/Time:		
Relinquished By: — Date/Time:	Received By: — Date/Time:		
Relinquished By: — Date/Time:	Received By: — Date/Time:		

1A

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

BHI-EE-011 (10/99)

019

RECRA
ENVIRONMENTAL
INC.
Chemical and Environmental Measurement Information

APR 2000
RECEIVED
Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B00-031
RFW#: 0002L572
SDG/SAF#: H0760/B00-031

W.O.#: 10985-001-001-9999-00
Date Received: 02-26-00

PCB

One (1) liquid sample was collected on 02-24-00.

The sample and its associated QC samples were extracted on 03-02-00 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 03-09-00. The extraction procedure was based on method 3520 and the extracts were analyzed based on method 8082 for Aroclors only.

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

1. The cooler temperature has been recorded on the chain-of-custodies.

2. All required holding times for extraction and analysis have been met.

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

4. The method blank was below the reporting limits for all target compounds.

5. One (1) of ten (10) surrogate recoveries were outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample). All other surrogates were low, but within QC limits, see statement 10 for further details.

6. The blank spike recovery was within acceptance criteria.

7. All matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

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

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

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

10. QC results suggest the presence of a matrix effect, the sample exhibited low recoveries for both the surrogates and the spiked aroclor (MS/MSD), however, blank spikes, fortified with the same spiking solution exhibited acceptable recoveries. There was, however, no indication of matrix effect in the chromatograms. The sample did contain a "yellow slime" on the bottom, the extracts were clear.

by

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

03-27-00
Date

pef\r:\group\data\pest\tnu\02L-572.pcb

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

Recra LabNet Philadelphia

GLOSSARY OF PESTICIDE/PCB DATA

P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Recra LabNet Philadelphia **Sample Discrepancy Report (SDR)** SDR #: 00GC0064

Initiator: Laura Kissinger Batch: 00032572 Parameter: OPCB
Date: 3/13/00 Samples: MS, MSD Matrix: W
Client: Trw Stanford Method: SW846/MCAWW/CLP/ Prep Batch: 00LE0210

1. Reason for SDR

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

b. General Discrepancy

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

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

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

- poor recoveries for MS, MSD spikes of MS-43%, MSD-21%.

2. Known or Probable Causes(s)

- Surrogates were within QC limits, BS spike OK. Surrogates were much lower in samples than in blanks, perhaps suggesting the poor recoveries were matrix-related.

3. Discussion and Proposed Action Other Description:

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

narrate

4. Project Manager Instructions...signature/date: 3/13/00

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

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

__ Verified re-[log][leach][extract][digest][analysis] (circle) 03-24-00
✓ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

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

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Doughty
__	X Lab Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Carey/Schrenkel/Johnson	__	__ GC/LC: Pastor
__	X Section Mgr: Wesson/Daniels	__	__ MS: Durke/Rycklak
__	X QA (file): Racioppi	__	__ Log-in: Keppel
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Doughty/Kauffman	__	__ Other: _____

L-WI-006/E-02/00

Recra LabNet - Lionville Laboratory

PCBs by GC

Report Date: 03/13/00 16:44

RFW Batch Number: **0002L572** Client: **TNU-HANFORD B99-031** Work Order: 10985001001 Page: 1

006

	Cust ID:	B0XNY9	B0XNY9	B0XNY9	PBLKHU	PBLKHU BS
Sample Information	RFW#:	001	001 MS	001 MSD	00LE0210-MB1	00LE0210-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate:	Tetrachloro-m-xylene	58 %	60 %	40 %	68 %	80 %
	Decachlorobiphenyl	26 %	43 %	16 * %	98 %	104 %
Aroclor-1016		1.1 U	1.1 U	1.1 U	1.0 U	1.0 U
Aroclor-1221		2.2 U	2.2 U	2.2 U	2.0 U	2.0 U
Aroclor-1232		1.1 U	1.1 U	1.1 U	1.0 U	1.0 U
Aroclor-1242		1.1 U	1.1 U	1.1 U	1.0 U	1.0 U
Aroclor-1248		1.1 U	1.1 U	1.1 U	1.0 U	1.0 U
Aroclor-1254		1.1 U	43 * %	21 * %	1.0 U	83 %
Aroclor-1260		1.1 U	1.1 U	1.1 U	1.0 U	1.0 U

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

Recra LabNet - Lionville Laboratory
PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-031

DATE RECEIVED: 02/26/00 RFW LOT # :0002L572

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0XNY9	001	W	00LE0210	02/24/00	03/02/00	03/09/00
B0XNY9	001 MS	W	00LE0210	02/24/00	03/02/00	03/09/00
B0XNY9	001 MSD	W	00LE0210	02/24/00	03/02/00	03/09/00
LAB QC:						
PBLKHU	MB1	W	00LE0210	N/A	03/02/00	03/09/00
PBLKHU	MB1 BS	W	00LE0210	N/A	03/02/00	03/09/00

RECRA LabNet Use Only

00021572

Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECRA LabNet

Client TMU-Hanford B99-031

Est. Final Proj. Sampling Date

Project # 10985-001-001-9999-00

Project Contact/Phone #

RECRA Project Manager aJ

QC Spec Del Std TAT 15 21 days

Date Rec'd 2-26-00 Date Due 3-12-00

Account #

Refrigerator #				5					5		5					00	
#/Type Container	Liquid			3 2g					1P		1P						
	Solid																
Volume	Liquid			1L					500		500						
	Solid																
Preservatives				—					HNO_3		HNO_3						
ANALYSES REQUESTED →		ORGANIC							INORG								
		VOA	BNA	~~Pest~~ PCB	Herb				ICP Metal	CN	Mercury						
									RECRA LabNet Use Only								
				OPCB					Met(1)		Mhg70						

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected													
001	BOXNY9	X	X	W	2/24/00	1130			X					X		X			

Special Instructions:

Saf B99-031

COMPOSITE WASTE

DATE/REVISIONS:

1. Run matrix QC on #001
2. Met(1) Fe, Pb, Mg, Mn, Ni, K, Ag, Na, Sb, Ba
3. Be, Cd, Cr, Co, Cu, V, Zn, Ca, As, Se, Si
4. Tl
5.
6.

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. 3.1 °C

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

NOTES:

4235 7953 4104

Relinquished by	Received by	Date	Time
FedEx	[signature]	2/26/00	0930

Relinquished by	Received by	Date	Time
	ORIGINAL		
	REWRITTEN		

Collector	Company Contact	Telephone No.	Project Coordinator	Price Code	Data Turnaround
Fahlberg	J Adler	373-4316	TRENT, SJ	7L	21 Days

Project Designation	Sampling Location	SAF No.	Air Quality
105F & 105DR LWTF Sampling	105DR	B99003	☐

Ice Chest No.	Field Logbook No.	COA	Method of Shipment
ERC 99-053011 RT 22500	EL 1424	R105D02F0C	Fed EX

Shipped To	Offsite Property No.	Bill of Lading/Air Bill No.
IMA/RECRA RECRA	~~AD00101~~ AD00116 RT 22500	42357953 4104

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HCl to pH <2	HNO3 to pH <2	HNO3 to pH <2	None	HNO3 to pH <2	HNO3 to pH <2
Type of Container	P	P	P	P	P	P	P	P	P	P
No. of Container(s)	1	1	1	1	1	1	1	1	2	2
Volume	500mL	500mL	500mL	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	Mercury - 7470 - (CV)	See item (1) in Special Instructions	Total Uranium	Technetium-99	See item (2) in Special Instructions	Nickel-63	Carbon-14	Isotopic Plutonium, Sodium-22, Americium-241/Curium-244	Strontium-89,90 -- Total Sr

Sample No.	Matrix *	Sample Date	Sample Time									
~~BOXNY9~~	~~Water~~	~~1130~~										
BOXNY9	Water	2-24-00	1130		X	X						

TICTO BOXP00

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By: R. Fahlberg / R. Fahlberg, Date/Time: 2-24-00	Received By: R. Thoren, Date/Time: 2-24-00 / 1115	(1) ICP Metals - 6010A (TAL): ICP Metals - 6010 [illegible] Thallium)
Relinquished By: R. Thoren, Date/Time: 2-25-00 / 1430	Received By: FED EX, Date/Time:	~~(2) Gamma Spectroscopy (Water) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Antimony-125, Cesium-134~~ DELETE RAT 2-24-00
Relinquished By: Fed Ex, Date/Time: 2-26-00 / 0930	Received By: [illegible], Date/Time: 2-26-00 / 0930	
Relinquished By: Date/Time:	Received By: Date/Time:	
Relinquished By: Date/Time:	Received By: Date/Time:	
Relinquished By: Date/Time:	Received By: Date/Time:	

Matrix: L=Liquid, Sd=Solid, SL=Sludge, S=Sludge, W=Water, O=Oil, A=Air, X=Other

1-A

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-01	Page 2 of 2

Collector Fahlberg	Company Contact J Adler	Telephone No. 373-4316	Project Coordinator TRENT, SJ	Price Code 7L	Data Turnaround 21 Days
Project Designation 105F & 105DR LWTF Sampling	Sampling Location 105DR		SAF No. B99-031	Air Quality ☐	
Ice Chest No. ERC 99 053041 RT 2500	Field Logbook No. EL 1424	COA R105D02F0C	Method of Shipment Fed EX		
Shipped To TMA/RECRA RECRA	Offsite Property No. ~~A00014~~ A00116 RT 2500		Bill of Lading/Air Bill No. 42357953 4104		

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

SAMPLE ANALYSIS

			Preservation	Cooled to 4C									
			Type of Container	aG									
			No. of Container(s)	3									
			Volume	1000mL									
				PCBs - 8082									
Sample No.	Matrix *	Sample Date	Sample Time									TIC TO	
B0XNY9	Water	2.24.00	1130	X								B0XQ00	

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By R Fahlberg / R Fahlberg Date/Time 2-24-00 1430	Received By R Thoren Date/Time R Thoren 2.24.00/1450	** Close SDG upon receipt of samples.	S=Soil SE=Sediment SO=Solid S=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other
Relinquished By R Thoren Date/Time R Thoren 2.25.00/1430	Received By FEDEX Date/Time		
Relinquished By FedEx Date/Time 2.26.00/0930	Received By D Jones Date/Time 2.26.00/0930		
Relinquished By Date/Time	Received By Date/Time		
Relinquished By Date/Time	Received By Date/Time		
Relinquished By Date/Time	Received By Date/Time		

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

14

BHI-EE-011 (10/99)

H0760 - TMA/RECRA

MAR 2000
RECEIVED
Data
Log In

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0760 was composed of one liquid (water) sample designated under SAF No. B99-031 with a Project Designation of: 105F & 105DR LWTF Sampling.

The sample was received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on March 20 and 21, 2000.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

There was contamination in the method blank. The activity (22.5 pCi/L) was well below the RDL (200 pCi/L) for C-14. No other problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

The LCS recovery (146%) was outside the BHI protocol limits of 70 -130%. A reanalysis/rerun waiver for the LCS was granted by BHI on March 16, 2000. No other problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.6 Radium-226 Analyses

No problems were encountered during the course of the analyses.

2.7 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.8 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.9 Transplutonic Analyses

No problems were encountered during the course of the analyses.

2.10 Gamma Spec Analyses

No problems were encountered during the course of the analyses.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

SAMPLE SUMMARY

SDG 7366
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0760

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0XNY9	105DR	WATER		R002187-01	B99-031	B99-013-01	02/24/00 11:30
Method Blank		WATER		R002187-03	B99-031		
Lab Control Sample		WATER		R002187-02	B99-031		
Duplicate (R002187-01)	105DR	WATER		R002187-04	B99-031		02/24/00 11:30
Spike (R002187-01)	105DR	WATER		R002187-05	B99-031		02/24/00 11:30

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

SDG 7366
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0760

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7366	B99-013-01	B0XNY9	WATER				02/26/00	2	R002187-01	7366-001
		Method Blank	WATER						R002187-03	7366-003
		Lab Control Sample	WATER						R002187-02	7366-002
		Duplicate (R002187-01)	WATER				02/26/00	2	R002187-04	7366-004
		Spike (R002187-01)	WATER				02/26/00	2	R002187-05	7366-005

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

PREP BATCH SUMMARY

SDG 7366
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0760

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
PU	WATER	Plutonium, Isotopic in Water	6914-145	5.0	1			1	1	1/1		
TP	WATER	Americium 241/Curium in Water	6914-145	5.0	1			1	1	1/1		
Beta Counting												
SR	WATER	Total Strontium in Water	6914-145	10.0	1			1	1	1/1		
TC	WATER	Technetium 99 in Water	6914-145	10.0	1			1	1	1/1		
Gamma Scan												
GAM	WATER	Gamma Emitters	6914-145	15.0	1			1	1	1/1		
Kinetic Phosphorimetry												
U_T	WATER	Uranium, Total in Water	6914-145	9.0	1			1	1	1/1		
Liquid Scintillation Counting												
C	WATER	Carbon 14 in Water	6914-145	10.0	1			1	1	1/1	1/1	
H	WATER	Tritium in Water	6914-145	10.0	1			1	1	1/1	1/1	
NI_L	WATER	Nickel-63 in Liquid	6914-145	10.0	1			1	1	1/1	1/1	
Radon Counting												
RA	WATER	Radium 226 in Water	6914-145	5.0	1			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 03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

WORK SUMMARY

SDG 7366
Contact Melissa C. Mannion

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0760

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
B0XNY9			R002187-01	7366-001	C		03/05/00	03/20/00	MCM	Carbon 14 in Water
105DR		WATER	02/24/00	7366-001	GAM		03/02/00	03/20/00	MCM	Gamma Emitters
B99-013-01	B99-031		02/26/00	7366-001	H		03/09/00	03/20/00	MCM	Tritium in Water
				7366-001	NI_L		03/09/00	03/20/00	MCM	Nickel-63 in Liquid
				7366-001	PU		03/03/00	03/30/00	MCM	Plutonium, Isotopic in Water
				7366-001	RA		03/17/00	03/21/00	MCM	Radium 226 in Water
				7366-001	SR		03/06/00	03/20/00	MCM	Total Strontium in Water
				7366-001	TC		03/13/00	03/20/00	MCM	Technetium 99 in Water
				7366-001	TP		03/08/00	03/20/00	MCM	Americium 241/Curium in Water
				7366-001	U_T		03/13/00	03/20/00	MCM	Uranium, Total in Water
Method Blank			R002187-03	7366-003	C		03/05/00	03/20/00	MCM	Carbon 14 in Water
		WATER		7366-003	GAM		03/06/00	03/20/00	MCM	Gamma Emitters
	B99-031			7366-003	H		03/09/00	03/20/00	MCM	Tritium in Water
				7366-003	NI_L		03/09/00	03/20/00	MCM	Nickel-63 in Liquid
				7366-003	PU		03/03/00	03/30/00	MCM	Plutonium, Isotopic in Water
				7366-003	RA		03/17/00	03/21/00	MCM	Radium 226 in Water
				7366-003	SR		03/06/00	03/20/00	MCM	Total Strontium in Water
				7366-003	TC		03/16/00	03/20/00	MCM	Technetium 99 in Water
				7366-003	TP		03/08/00	03/20/00	MCM	Americium 241/Curium in Water
				7366-003	U_T		03/13/00	03/20/00	MCM	Uranium, Total in Water
Lab Control Sample			R002187-02	7366-002	C		03/05/00	03/20/00	MCM	Carbon 14 in Water
		WATER		7366-002	GAM		03/04/00	03/20/00	MCM	Gamma Emitters
	B99-031			7366-002	H		03/09/00	03/20/00	MCM	Tritium in Water
				7366-002	NI_L		03/09/00	03/20/00	MCM	Nickel-63 in Liquid
				7366-002	PU		03/03/00	03/30/00	MCM	Plutonium, Isotopic in Water
				7366-002	RA		03/17/00	03/21/00	MCM	Radium 226 in Water
				7366-002	SR		03/06/00	03/20/00	MCM	Total Strontium in Water
				7366-002	TC		03/11/00	03/20/00	MCM	Technetium 99 in Water
				7366-002	TP		03/08/00	03/20/00	MCM	Americium 241/Curium in Water
				7366-002	U_T		03/13/00	03/20/00	MCM	Uranium, Total in Water

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

SDG 7366
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0760

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (R002187-01)			R002187-04	7366-004	C		03/05/00	03/20/00	MCM	Carbon 14 in Water
105DR		WATER	02/24/00	7366-004	GAM		03/07/00	03/20/00	MCM	Gamma Emitters
	B99-031		02/26/00	7366-004	H		03/10/00	03/20/00	MCM	Tritium in Water
				7366-004	NI_L		03/09/00	03/20/00	MCM	Nickel-63 in Liquid
				7366-004	PU		03/03/00	03/30/00	MCM	Plutonium, Isotopic in Water
				7366-004	RA		03/17/00	03/21/00	MCM	Radium 226 in Water
				7366-004	SR		03/06/00	03/20/00	MCM	Total Strontium in Water
				7366-004	TC		03/11/00	03/20/00	MCM	Technetium 99 in Water
				7366-004	TP		03/08/00	03/20/00	MCM	Americium 241/Curium in Water
				7366-004	U_T		03/13/00	03/20/00	MCM	Uranium, Total in Water
Spike (R002187-01)			R002187-05	7366-005	C		03/06/00	03/20/00	MCM	Carbon 14 in Water
105DR		WATER	02/24/00	7366-005	H		03/10/00	03/20/00	MCM	Tritium in Water
	B99-031		02/26/00	7366-005	NI_L		03/09/00	03/20/00	MCM	Nickel-63 in Liquid

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
C	B99-031	Carbon 14 in Water	C14CHEMLSC	1			1	1	1	1	5
GAM	B99-031	Gamma Emitters	GAMMAHI	1			1	1	1		4
H	B99-031	Tritium in Water	EPA906.0	1			1	1	1	1	5
NI_L	B99-031	Nickel-63 in Liquid	NI63LSC	1			1	1	1	1	5
PU	B99-031	Plutonium, Isotopic in Water	PUPLATE	1			1	1	1		4
RA	B99-031	Radium 226 in Water	EPA903.1	1			1	1	1		4
SR	B99-031	Total Strontium in Water	SRTOTAL	1			1	1	1		4
TC	B99-031	Technetium 99 in Water	TC99TRLSC	1			1	1	1		4
TP	B99-031	Americium 241/Curium in Water	HASL 300/AM-03	1			1	1	1		4
U_T	B99-031	Uranium, Total in Water	UKPA	1			1	1	1		4
TOTALS				10			10	10	10	3	43

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

R002187-03 Method Blank

METHOD BLANK

SDG	7366	Client/Case no	Hanford	SDG H0760	
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925		
Lab sample id	R002187-03	Client sample id	Method Blank		
Dept sample id	7366-003	Material/Matrix		WATER	
		SAF No	B99-031		

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	38.0	89	150	400	U	H
Carbon 14	14762-75-5	22.5	12	19	200	J	C
Technetium 99	14133-76-7	0.892	4.2	11	15	U	TC
Curium 244	13981-15-2	0	0.018	0.042	1.0	U	TP
Total Uranium (ug/L)	7440-61-1	-0.105	0.021	0.030	0.10	U	U_T
Plutonium 238	13981-16-3	-0.003	0.021	0.046	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.010	0.021	0.053	1.0	U	PU
Nickel 63	13981-37-8	-5.58	12	21	15	U	NI_L
Total Strontium	SR-RAD	0.185	0.26	0.36	2.0	U	SR
Potassium 40	13966-00-2	U		250		U	GAM
Americium 241	14596-10-2	-0.009	0.018	0.042	1.0	U	TP
Cobalt 60	10198-40-0	U		13	25	U	GAM
Radium 226	13982-63-3	-0.386	0.48	1.1	2.0	U	RA
Antimony 125	14234-35-6	U		34		U	GAM
Cesium 134	13967-70-9	U		17		U	GAM
Cesium 137	10045-97-3	U		14	15	U	GAM
Europium 152	14683-23-9	U		37	50	U	GAM
Europium 154	15585-10-1	U		49	50	U	GAM
Europium 155	14391-16-3	U		40	50	U	GAM
Radium 226	13982-63-3	U		27		U	GAM
Radium 228	15262-20-1	U		60		U	GAM
Thorium 228	14274-82-9	U		19		U	GAM
Thorium 232	TH-232	U		60		U	GAM
Americium 241	14596-10-2	U		51		U	GAM
Uranium 238	U-238	U		1500		U	GAM
Uranium 235	15117-96-1	U		57		U	GAM

105F & 105DR LWTF Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

R002187-03 Method Blank

BLANK, cont.

SDG	7366	Client/Case no	Hanford	SDG	H0760
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925		
Lab sample id	R002187-03	Client sample id	Method Blank		
Dept sample id	7366-003	Material/Matrix		WATER	
		SAF No	B99-031		

QC-BLANK 33666

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

R002187-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7366

Contact Melissa C. Mannion

Client/Case no Hanford SDG H0760

Case no TRB-SBB-207925

Lab sample id R002187-02

Dept sample id 7366-002

Client sample id Lab Control Sample

Material/Matrix WATER

SAF No B99-031

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	8020	250	150	400		H	8280	330	97	84-116	80-120
Carbon 14	43100	430	78	200		C	51000	2000	85	86-114	70-130
Technetium 99	984	34	12	15		TC	1090	44	90	84-116	80-120
Curium 244	9.29	0.61	0.11	1.0		TP	10.5	0.42	88	88-112	70-130
Total Uranium (ug/L)	100	16	0.30	0.10		U_T	103	4.1	97	73-127	80-120
Plutonium 238	10.1	0.74	0.050	1.0		PU	11.2	0.45	90	87-113	80-120
Plutonium 239/240	10.7	0.78	0.028	1.0		PU	11.9	0.48	90	87-113	80-120
Nickel 63	1300	32	20	15		NI_L	1340	54	97	84-116	70-130
Total Strontium	32.7	1.8	0.73	2.0		SR	22.4	0.90	146	74-126	80-120
Americium 241	8.82	0.58	0.048	1.0		TP	9.58	0.38	92	87-113	70-130
Cobalt 60	541	22	13	25		GAM	476	19	114	73-127	80-120
Radium 226	309	8.2	1.5	2.0		RA	295	12	105	89-111	70-130
Cesium 137	593	21	15	15		GAM	512	20	116	73-127	80-120

105F & 105DR LWTF Sampling

QC-LCS 33665

Lab id TMANC

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

R002187-04 B0XNY9

DUPLICATE

SDG	7366	Client/Case no	Hanford SDG H0760
Contact	Melissa C. Mannion	Case no	TRB-SBB-207925
DUPLICATE		ORIGINAL	
Lab sample id	R002187-04	Lab sample id	R002187-01
Dept sample id	7366-004	Dept sample id	7366-001
		Received	02/26/00
Client sample id	B0XNY9		
Location/Matrix	105DR WATER		
Collected	02/24/00 11:30		
Custody/SAF No	B99-013-01 B99-031		

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Tritium	53400	610	150	400		H	52600	600	150		2	21
Carbon 14	74.4	12	19	200	JB	C	72.4	12	19	JB	3	41
Technetium 99	1.99	4.3	11	15	U	TC	1.89	5.6	13	U	-	
Curium 244	0.035	0.051	0.081	1.0	U	TP	0.055	0.049	0.058	U	-	
Total Uranium (ug/L)	9.27	1.4	0.030	0.10		U_T	9.82	1.5	0.030		6	37
Plutonium 238	0.091	0.052	0.058	1.0	J	PU	0.010	0.031	0.063	U	160	180
Plutonium 239/240	1.78	0.21	0.048	1.0		PU	1.63	0.22	0.063		9	29
Nickel 63	1280	33	21	15		NI_L	1280	32	19		0	22
Total Strontium	21300	420	13	2.0		SR	21700	370	9.5		2	22
Potassium 40	U		160		U	GAM	U		370	U	-	
Americium 241	0.751	0.11	0.065	1.0	J	TP	0.742	0.14	0.058	J	1	37
Cobalt 60	U		43	25	U	GAM	22.9	13	15	J	61	207
Radium 226	0.262	0.41	0.71	2.0	U	RA	0.440	0.60	1.0	U	-	
Antimony 125	U		54		U	GAM	U		50	U	-	
Cesium 134	U		16		U	GAM	U		18	U	-	
Cesium 137	1900	56	21	15		GAM	2310	42	19		19	32
Europium 152	U		54	50	U	GAM	U		49	U	-	
Europium 154	U		41	50	U	GAM	U		45	U	-	
Europium 155	U		34	50	U	GAM	U		41	U	-	
Radium 226	U		26		U	GAM	U		45	U	-	
Radium 228	U		58		U	GAM	U		64	U	-	
Thorium 228	U		21		U	GAM	U		26	U	-	
Thorium 232	U		58		U	GAM	U		64	U	-	
Americium 241	U		24		U	GAM	U		24	U	-	
Uranium 238	U		1800		U	GAM	U		1700	U	-	
Uranium 235	U		54		U	GAM	U		64	U	-	

105F & 105DR LWTF Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

R002187-04 B0XNY9

DUPLICATE, cont.

SDG	7366		Client/Case no	Hanford	SDG H0760
Contact	Melissa C. Mannion		Case no	TRB-SBB-207925	
DUPLICATE		ORIGINAL			
Lab sample id	R002187-04	Lab sample id	R002187-01	Client sample id	B0XNY9
Dept sample id	7366-004	Dept sample id	7366-001	Location/Matrix	105DR WATER
		Received	02/26/00	Collected	02/24/00 11:30
				Custody/SAF No	B99-013-01 B99-031

QC-DUP#1 33667

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

R002187-05 B0XNY9

MATRIX SPIKE

SDG 7366		Client/Case no Hanford	SDG H0760
Contact Melissa C. Mannion		Case no TRB-SBB-207925	
MATRIX SPIKE	ORIGINAL		
Lab sample id R002187-05	Lab sample id R002187-01	Client sample id B0XNY9	
Dept sample id 7366-005	Dept sample id 7366-001	Location/Matrix 105DR	WATER
	Received 02/26/00	Collected 02/24/00 11:30	
		Custody/SAF No B99-013-01	B99-031

ANALYTE	SPIKE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	ORIGINAL pCi/L	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	65300	680	150	400		H	17000	680	52600	600	75	25-175	60-140
Carbon 14	42600	430	77	200		C	51000	2000	72.4	12	83	86-114	60-140
Nickel 63	2330	41	19	15		NI_L	1340	54	1280	32	78	69-131	60-140

105F & 105DR LWTF Sampling

QC-MS#1 33668

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

R002187-01 B0XNY9

DATA SHEET

SDG	7366	Client/Case no	Hanford SDG H0760
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	R002187-01	Client sample id	B0XNY9
Dept sample id	7366-001	Location/Matrix	105DR WATER
Received	02/26/00	Collected	02/24/00 11:30
		Custody/SAF No	B99-013-01 B99-031

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Tritium	10028-17-8	52600	600	150	400		H
Carbon 14	14762-75-5	72.4	12	19	200	JB	C
Technetium 99	14133-76-7	1.89	5.6	13	15	U	TC
Curium 244	13981-15-2	0.055	0.049	0.058	1.0	U	TP
Total Uranium (ug/L)	7440-61-1	9.82	1.5	0.030	0.10		U_T
Plutonium 238	13981-16-3	0.010	0.031	0.063	1.0	U	PU
Plutonium 239/240	PU-239/240	1.63	0.22	0.063	1.0		PU
Nickel 63	13981-37-8	1280	32	19	15		NI_L
Total Strontium	SR-RAD	21700	370	9.5	2.0		SR
Potassium 40	13966-00-2	U		370		U	GAM
Americium 241	14596-10-2	0.742	0.14	0.058	1.0	J	TP
Cobalt 60	10198-40-0	22.9	13	15	25	J	GAM
Radium 226	13982-63-3	0.440	0.60	1.0	2.0	U	RA
Antimony 125	14234-35-6	U		50		U	GAM
Cesium 134	13967-70-9	U		18		U	GAM
Cesium 137	10045-97-3	2310	42	19	15		GAM
Europium 152	14683-23-9	U		49	50	U	GAM
Europium 154	15585-10-1	U		45	50	U	GAM
Europium 155	14391-16-3	U		41	50	U	GAM
Radium 226	13982-63-3	U		45		U	GAM
Radium 228	15262-20-1	U		64		U	GAM
Thorium 228	14274-82-9	U		26		U	GAM
Thorium 232	TH-232	U		64		U	GAM
Americium 241	14596-10-2	U		24		U	GAM
Uranium 238	U-238	U		1700		U	GAM
Uranium 235	15117-96-1	U		64		U	GAM

105F & 105DR LWTF Sampling

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

Test	PU
Matrix	WATER
SDG	7366
Contact	Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN WATER

ALPHA SPECTROSCOPY

Client	Hanford
Contract	TRB-SBB-207925
Contract	SDG H0760

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240
Preparation batch 6914-145							
B0XNY9	R002187-01			7366-001	U		1.63
BLK (QC ID=33666)	R002187-03			7366-003	U		U
LCS (QC ID=33665)	R002187-02			7366-002	ok		ok
Duplicate (R002187-01)	R002187-04			7366-004	ok	J	ok
Nominal values and limits from method				RDLs (pCi/L)	1.0		1.0
105F & 105DR LWTF Sampling							

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6914-145 2σ prep error 5.0 % Reference Lab Notebook 6914 pg. 145																
B0XNY9	R002187-01			0.063	0.500			52		858			8	03/03/00	03/03	SS-055
BLK (QC ID=33666)	R002187-03			0.053	0.500			81		858				03/03/00	03/03	SS-057
LCS (QC ID=33665)	R002187-02			0.050	0.500			73		858				03/03/00	03/03	SS-056
Duplicate (R002187-01) (QC ID=33667)	R002187-04			0.058	0.500			64		858			8	03/03/00	03/03	SS-058
Nominal values and limits from method				1.0	0.500			20-105		700	100		180			

PROCEDURES	REFERENCE	PUPLATE
	CP-040	Environmental Water Dissolution, rev 3
	CP-940	Plutonium Separation and Purification, rev 2
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES				
MDA	0.056	±	0.011
YIELD	68	±	25

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

Test TP	Matrix WATER
SDG 7366	
Contact Melissa C. Mannion	

METHOD SUMMARY

AMERICIUM 241/CURIUM IN WATER

ALPHA SPECTROSCOPY

Client Hanford	
Contract TRB-SBB-207925	
Contract SDG H0760	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Curium 244		Americium 241		Curium 242
Preparation batch 6914-145									
B0XNY9	R002187-01			7366-001	U		0.742	J	
BLK (QC ID=33666)	R002187-03			7366-003	U		U		
LCS (QC ID=33665)	R002187-02			7366-002	ok		ok		
Duplicate (R002187-01)	R002187-04			7366-004	-	U	ok	J	
Nominal values and limits from method				RDLs (pCi/L)	1.0		1.0		1.0
105F & 105DR LWTF Sampling									

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6914-145	2σ prep error 5.0 %			Reference Lab Notebook 6914 pg. 145												
B0XNY9	R002187-01			0.058	0.500			46		914			13	03/07/00	03/08	SS-015
BLK (QC ID=33666)	R002187-03			0.042	0.500			61		914				03/07/00	03/08	SS-016
LCS (QC ID=33665)	R002187-02			0.11	0.500			90		897				03/07/00	03/08	SS-027
Duplicate (R002187-01) (QC ID=33667)	R002187-04			0.081	0.500			62		1160			13	03/07/00	03/08	SS-045
Nominal values and limits from method				1.0	0.500			20-105		700	100		180			

PROCEDURES	REFERENCE	HASL 300/AM-03
	EP-960	Americium-Curium Purification, rev 0
	EP-070	Soil Dissolution, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES				
MDA	0.073	±	0.059
YIELD	65	±	37

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

Test	SR
Matrix	WATER
SDG	7366
Contact	Melissa C. Mannion

METHOD SUMMARY

TOTAL STRONTIUM IN WATER

BETA COUNTING

Client	Hanford
Contract	TRB-SBB-207925
Contract	SDG H0760

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 6914-145					
B0XNY9	R002187-01			7366-001	21700
BLK (QC ID=33666)	R002187-03			7366-003	U
LCS (QC ID=33665)	R002187-02			7366-002	HIGH
Duplicate (R002187-01)	R002187-04			7366-004	ok
Nominal values and limits from method				RDLs (pCi/L)	2.0
105F & 105DR LWTF Sampling					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6914-145	2σ prep error 10.0 % Reference Lab Notebook 6914 pg. 145															
B0XNY9	R002187-01			9.5	0.500			98		377			11	03/06/00	03/06	GRB-217
BLK (QC ID=33666)	R002187-03			0.36	0.500			88		378				03/06/00	03/06	GRB-219
LCS (QC ID=33665)	R002187-02			0.73	0.500			86		378				03/06/00	03/06	GRB-218
Duplicate (R002187-01) (QC ID=33667)	R002187-04			13	0.500			92		377			11	03/06/00	03/06	GRB-220
Nominal values and limits from method				2.0	0.500					100			180			

PROCEDURES	REFERENCE	SRTOTAL
	CP-501	Strontium in Water Samples, rev 1

AVERAGES ± 2 SD FOR 4 SAMPLES	MDA	5.9	±	13
	YIELD	91	±	11

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

Test	TC
Matrix	WATER
SDG	7366
Contact	Melissa C. Mannion

METHOD SUMMARY

TECHNETIUM 99 IN WATER

BETA COUNTING

Client	Hanford
Contract	TRB-SBB-207925
Contract	SDG H0760

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Technetium 99	
Preparation batch 6914-145						
B0XNY9	R002187-01			7366-001	U	
BLK (QC ID=33666)	R002187-03			7366-003	U	
LCS (QC ID=33665)	R002187-02			7366-002	ok	
Duplicate (R002187-01)	R002187-04			7366-004	-	U
Nominal values and limits from method				RDLs (pCi/L)	15	
105F & 105DR LWTF Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6914-145	2σ prep error 10.0 %				Reference Lab Notebook 6914 pg. 145											
B0XNY9	R002187-01			13	0.0500			54		101			18	03/08/00	03/13	GRB-203
BLK (QC ID=33666)	R002187-03			11	0.0500			64		101				03/08/00	03/16	GRB-231
LCS (QC ID=33665)	R002187-02			12	0.0500			58		101				03/08/00	03/11	GRB-222
Duplicate (R002187-01) (QC ID=33667)	R002187-04			11	0.0500			67		101			16	03/08/00	03/11	GRB-223
Nominal values and limits from method				15	0.0500			20-105		50			180			

PROCEDURES	REFERENCE	TC99TRLSC
	CP-021	Preparation of Tc-99m Tracer, rev 0
	CP-002	Q.C. Preparation, rev 2
	CP-003	Tracing, rev 2
	CP-541	Technetium-99 Purification (Water) by Extraction Chromatography, rev 0
	CP-008	Heavy Element Electroplating, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES				
MDA	12	±	1.9
YIELD	61	±	12

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

Test GAM Matrix WATER
SDG 7366
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA EMITTERS

GAMMA SCAN

Client Hanford
Contract TRB-SBB-207925
Contract SDG H0760

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137
Preparation batch 6914-145							
B0XNY9	R002187-01			7366-001	22.9	J	2310
BLK (QC ID=17423)	R002187-03			7366-003	U		U
LCS (QC ID=17422)	R002187-02			7366-002	ok		ok
Duplicate (R002187-01)	R002187-04			7366-004	ok	U	ok
Nominal values and limits from method 105F & 105DR LWTF Sampling				RDLs (pCi/L)	25		15

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6914-145 2σ prep error 15.0 % Reference Lab Notebook 6914 pg. 145																
B0XNY9	R002187-01			19	0.500					435			7	02/29/00	03/02	MB,07,00
BLK (QC ID=17423)	R002187-03			14	0.500					426				02/29/00	03/06	01,03,00
LCS (QC ID=17422)	R002187-02			15	0.500					733				02/29/00	03/04	MB,07,00
Duplicate (R002187-01) (QC ID=17424)	R002187-04			21	0.500					400			12	02/29/00	03/07	01,01,00
Nominal values and limits from method				15	0.500					400			180			

PROCEDURES	REFERENCE	GAMMAHI
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 2

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 17 ± 6.6
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

Test U T Matrix WATER
SDG 7366
Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, TOTAL IN WATER
KINETIC PHOSPHORIMETRY

Client Hanford
Contract TRB-SBB-207925
Contract SDG H0760

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Uranium
Preparation batch 6914-145					
B0XNY9	R002187-01			7366-001	9.82
BLK (QC ID=33666)	R002187-03			7366-003	U
LCS (QC ID=33665)	R002187-02			7366-002	ok
Duplicate (R002187-01)	R002187-04			7366-004	ok
Nominal values and limits from method				RDLs (ug/L)	0.10
105F & 105DR LWTF Sampling					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA ug/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6914-145	2σ prep error 9.0 %			Reference Lab Notebook 6914 pg. 145												
B0XNY9	R002187-01			0.030	0.0200								18	03/13/00	03/13	KPA-001
BLK (QC ID=33666)	R002187-03			0.030	0.0200									03/13/00	03/13	KPA-001
LCS (QC ID=33665)	R002187-02			0.30	0.0200									03/13/00	03/13	KPA-001
Duplicate (R002187-01) (QC ID=33667)	R002187-04			0.030	0.0200								18	03/13/00	03/13	KPA-001
Nominal values and limits from method				0.10	0.0200								180			

PROCEDURES	REFERENCE	UKPA
	CP-040	Environmental Water Dissolution, rev 3
	CP-044	Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 2
	CP-928	Total Uranium by Kinetic Phosphorimetry, rev 2

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.098 ± 0.27
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

Test C	Matrix WATER
SDG 7366	
Contact Melissa C. Mannion	

METHOD SUMMARY

CARBON 14 IN WATER

LIQUID SCINTILLATION COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Contract SDG H0760	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
Preparation batch 6914-145						
B0XNY9	R002187-01			7366-001	72.4	J
BLK (QC ID=33666)	R002187-03			7366-003	22.5	J
LCS (QC ID=33665)	R002187-02			7366-002	LOW	
Duplicate (R002187-01)	R002187-04			7366-004	ok	J
Spike (R002187-01)	R002187-05			7366-005	LOW	

Nominal values and limits from method RDLs (pCi/L) 200

105F & 105DR LWTF Sampling

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6914-145	2σ prep error 10.0 %				Reference Lab Notebook 6914 pg. 145											
B0XNY9	R002187-01			19	0.0500			100		200			10	03/03/00	03/05	LSC-004
BLK (QC ID=33666)	R002187-03			19	0.0500			100		200				03/03/00	03/05	LSC-004
LCS (QC ID=33665)	R002187-02			78	0.0500			100		11				03/03/00	03/05	LSC-004
Duplicate (R002187-01) (QC ID=33667)	R002187-04			19	0.0500			100		200			10	03/03/00	03/05	LSC-004
Spike (R002187-01) (QC ID=33668)	R002187-05			77	0.0500			100		11			11	03/03/00	03/06	LSC-004
Nominal values and limits from method				200	0.0500					150			180			

PROCEDURES	REFERENCE	C14CHEMLSC
	CP-241	Carbon-14 in Aqueous Samples, rev 2

AVERAGES ± 2 SD	MDA 42	± 64
FOR 5 SAMPLES	YIELD 100	± 0

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

Test H	Matrix WATER
SDG 7366	
Contact Melissa C. Mannion	

METHOD SUMMARY

TRITIUM IN WATER

LIQUID SCINTILLATION COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Contract SDG H0760	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium
Preparation batch 6914-145					
B0XNY9	R002187-01			7366-001	52600
BLK (QC ID=33666)	R002187-03			7366-003	U
LCS (QC ID=33665)	R002187-02			7366-002	ok
Duplicate (R002187-01)	R002187-04			7366-004	ok
Spike (R002187-01)	R002187-05			7366-005	ok

Nominal values and limits from method RDLs (pCi/L) 400

105F & 105DR LWTF Sampling

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6914-145	2σ prep error 10.0 %				Reference Lab Notebook 6914 pg. 145											
B0XNY9	R002187-01			150	0.0100			100		100			14	03/07/00	03/09	LSC-007
BLK (QC ID=33666)	R002187-03			150	0.0100			100		100				03/07/00	03/09	LSC-007
LCS (QC ID=33665)	R002187-02			150	0.0100			100		100				03/07/00	03/09	LSC-007
Duplicate (R002187-01) (QC ID=33667)	R002187-04			150	0.0100			100		100			15	03/07/00	03/10	LSC-007
Spike (R002187-01) (QC ID=33668)	R002187-05			150	0.0100			100		97			15	03/07/00	03/10	LSC-007
Nominal values and limits from method				400	0.0100					25			180			

PROCEDURES	REFERENCE	EPA906.0
	CP-210	Tritium in Water Samples by Distillation, rev 3

AVERAGES ± 2 SD	MDA 150	±	0
FOR 5 SAMPLES	YIELD 100	±	0

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

Test NI L Matrix WATER
SDG 7366
Contact Melissa C. Mannion

METHOD SUMMARY

NICKEL-63 IN LIQUID
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRB-SBB-207925
Contract SDG H0760

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63
Preparation batch 6914-145					
B0XNY9	R002187-01			7366-001	1280
BLK (QC ID=33666)	R002187-03			7366-003	U
LCS (QC ID=33665)	R002187-02			7366-002	ok
Duplicate (R002187-01)	R002187-04			7366-004	ok
Spike (R002187-01)	R002187-05			7366-005	ok
Nominal values and limits from method				RDLs (pCi/L)	15
105F & 105DR LWTF Sampling					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6914-145	2σ prep error 10.0 %			Reference Lab Notebook 6914 pg. 145												
B0XNY9	R002187-01			19	0.0500			95		100			14	03/07/00	03/09	LSC-007
BLK (QC ID=33666)	R002187-03			21	0.0500			89		100				03/07/00	03/09	LSC-007
LCS (QC ID=33665)	R002187-02			20	0.0500			93		100				03/07/00	03/09	LSC-007
Duplicate (R002187-01) (QC ID=33667)	R002187-04			21	0.0500			90		100			14	03/07/00	03/09	LSC-007
Spike (R002187-01) (QC ID=33668)	R002187-05			19	0.0500			90		100			14	03/07/00	03/09	LSC-007
Nominal values and limits from method				15	0.0500					25			180			

PROCEDURES	REFERENCE	NI63LSC
	RP-070	Sample Dissolution - HF Method, rev 0
	RP-431	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 20 ± 2.0
YIELD 91 ± 5

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 03/21/00

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0760

Test RA	Matrix WATER
SDG 7366	
Contact Melissa C. Mannion	

METHOD SUMMARY

RADIUM 226 IN WATER

RADON COUNTING

Client Hanford	
Contract TRB-SBB-207925	
Contract SDG H0760	

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Radium 226	
Preparation batch 6914-145						
B0XNY9	R002187-01			7366-001	U	
BLK (QC ID=33666)	R002187-03			7366-003	U	
LCS (QC ID=33665)	R002187-02			7366-002	ok	
Duplicate (R002187-01)	R002187-04			7366-004	-	U
Nominal values and limits from method				RDLs (pCi/L)	2.0	
105F & 105DR LWTF Sampling						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6914-145	2σ prep error 5.0 %				Reference Lab Notebook 6914 pg. 145											
B0XNY9	R002187-01			1.0	0.0400			100		101			22	03/17/00	03/17	RN-012
BLK (QC ID=33666)	R002187-03			1.1	0.0400			100		101				03/17/00	03/17	RN-013
LCS (QC ID=33665)	R002187-02			1.5	0.0400			100		101				03/17/00	03/17	RN-010
Duplicate (R002187-01) (QC ID=33667)	R002187-04			0.71	0.0400			100		101			22	03/17/00	03/17	RN-014
Nominal values and limits from method				2.0	0.0400			20-105		100			180			

PROCEDURES	REFERENCE	EPA903.1
	CP-701	Radium-226 in Water and Dissolved Samples, rev 2

AVERAGES ± 2 SD	MDA	1.1	± 0.65
FOR 4 SAMPLES	YIELD	100	± 0

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	03/21/00

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-031-01	Page 1 of 2
Collector: Fahlberg	Company Contact: J Adler; Telephone No.: 373-4316	Project Coordinator: TRENT, SJ	Price Code: 7L; Data Turnaround: 21 Days
Project Designation: 105F & 105DR LWTF Sampling	Sampling Location: 105DR H0760 (7366)	SAF No.: B99-031	Air Quality ☐
Ice Chest No.: ERC99 053	Field Logbook No.: EL 1424; COA: R105D02F0C	Method of Shipment: Fed EX	
Shipped To: TMA/RECRA TMA	Offsite Property No.: A000101	Bill of Lading/Air Bill No.: 42357953 4115	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HCl to pH <2	HNO3 to pH <2	HNO3 to pH <2	None	HNO3 to pH <2	HNO3 to pH <2
Type of Container	P	aG	P	P	P	P	P	P	P	P
No. of Container(s)	1	1	1	1	1	1	1	1	2 a	2 b
Volume	250mL	500mL	500mL	500mL	1000mL	1000mL	1000mL	1000mL	1000mL	1000mL
SAMPLE ANALYSIS	Tritium - H3	Mercury - See item (1) in 7470 - (GV) Special Instructions.		Total Uranium	Technetium-99	See item (2) in Special Instructions.	Nickel-63	Carbon-14	Isotopic Plutonium; Radium -226; Americium-241/Curium-244	Strontium-89,90 – Total Sr

Delete RAT 2.24.00

Sample No.	Matrix *	Sample Date	Sample Time										
~~B0XNY9~~	~~Water~~	~~1130~~											
B0XNY9	Water	2-24-00	1130	X			X	X	X	X	X	X	X

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By: R. Fahlberg / R. Hilber	2-24-00 1450	Received By: R. Thoren	2-24-00 1450
Relinquished By: R. Thoren	2-25-00 1430	Received By: FED EX	2-25-00
Relinquished By: FedEX	2-26-00 10:00	Received By: TNV M. Goldenberg	2-26-00 10:00
Relinquished By		Received By	
Relinquished By		Received By	
Relinquished By		Received By	

SPECIAL INSTRUCTIONS

** Close SDG upon receipt of samples.

~~(1) ICP Metals - 6010A (TAL); ICP Metals - 6010A (Add-on) (Arsenic, Lead, Selenium, Silicon, Thallium)~~ Delete RAT 2.24.00

(2) Gamma Spectroscopy(Water) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241, Antimony-125, Cesium-134}

FAXED 2/28/00

1-A

Matrix *

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

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

BHI-EE-011 (10/99)

Thermo NUtech - Richmond

SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc Date/Time received 2-26-00 10:00

CoC No. B99-031-01

Container I.D. No. _____ Requested TAT (Days) 21 P.O. Received Yes [ ] No [✓]

INSPECTION

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

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by M. Goldenberg Date: 2-26-00 Time: 10:00

LOGIN

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

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____

Form SCP-01.2, 11-06-98

"50 years of quality nuclear services"