H0114-T/W

RECRA LabNet

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Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD
RFW# : 9710L067

W.O.# : 10985-001-001-9998-00
Date Received: 10-30-97

MAR 1998 RECEIVED EDMC

METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 water 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 control limits.

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

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

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

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

10. All matrix spike (MS) and matrix spike duplicate (MSD) recoveries for samples BOM7C3 was outside the 80-120% control limits. The MS for 1 analyte (sample BOM7C4) was outside the 80-120% control limits and all MSDs were within the 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 28 pages (Including pages 001A & 001B).

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

11. All MSs and MSDs for sample BOM7C3 were within the 20% Relative Percent Difference (RPD) control limits. The MSs and MSDs for 2 analytes (sample BOM7C4) were outside the 20% RPD control limits. Refer to the Inorganics Matrix Spike Duplicate Report.

12. The duplicate analyses for 2 analytes (samples BOM7C3 and BOM7C4) were outside the 20% 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.

Bruce C Taylor unit leader

for J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

12-10-07
Date

skt\m10-067

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

SDG#: H0014
Laboratory Batch: 9710L067

W.O.#: 10985-001-001-9999-00
Collection Dates: 10-28-97

SAMPLE ID	LABORATORY ID
BOM7C3	9710L067-001
BOM7C4	9710L067-002
BOM7D8	9710L067-003
BOM7D9	9710L067-004

skl/m10-067.cp

METALS METHODS GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this RFW Lot#: 97 10L067

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	✓6010A		__200.7				__99
Antimony	✓6010A	__7041 [5]	__200.7	__204.2			__99
Arsenic	✓6010A	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	✓6010A		__200.7				__99
Beryllium	✓6010A		__200.7				__99
Bismuth	__6010A [1]		__200.7 [1]			__1620	__99
Boron	__6010A [1]		__200.7				__99
Cadmium	✓6010A	__7131A [5]	__200.7	__213.2			__99
Calcium	✓6010A		__200.7				__99
Chromium	✓6010A	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	✓6010A		__200.7				__99
Copper	✓6010A	__7211 [5]	__200.7	__220.2			__99
Iron	✓6010A		__200.7				__99
Lead	✓6010A	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010A	__7430 [4]	__200.7			__1620	__99
Magnesium	✓6010A		__200.7				__99
Manganese	✓6010A		__200.7				__99
Mercury	✓7470A [3]	__7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010A		__200.7				__99
Nickel	✓6010A		__200.7				__99
Potassium	✓6010A	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010A [1]		__200.7 [1]			__1620	__99
Selenium	✓6010A	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010A [1]		__200.7			__1620	__99
Silica	__6010A [1]		__200.7			__1620	__99
Silver	✓6010A	__7761 [5]	__200.7	__272.2			__99
Sodium	✓6010A	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010A		__200.7				__99
Thallium	✓6010A	__7841 [5]	__200.7	__279.2__200.9			__99
Tin	__6010A [1]		__200.7				__99
Titanium	__6010A [1]		__200.7				__99
Uranium	__6010A [1]		__200.7 [1]			__1620	__99
Vanadium	✓6010A		__200.7				__99
Zinc	✓6010A		__200.7				__99
Zirconium	__6010A [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

RFW 21-21-033/M-01/97

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 12/08/97

CLIENT: TNU-HANFORD

RECRA LOT #: 9710L067

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BOM7C3	Silver, Soluble	5.0	u	UG/L	5.0	1.0
		Aluminum, Soluble	38.2	u	UG/L	38.2	1.0
		Arsenic, Soluble	30.6	u	UG/L	30.6	1.0
		Barium, Soluble	44.0		UG/L	2.5	1.0
		Beryllium, Soluble	0.30	u	UG/L	0.30	1.0
		Calcium, Soluble	59700		UG/L	17.9	1.0
		Cadmium, Soluble	3.8	u	UG/L	3.8	1.0
		Cobalt, Soluble	4.1	u	UG/L	4.1	1.0
		Chromium, Soluble	23.7		UG/L	3.1	1.0
		Copper, Soluble	7.1		UG/L	4.2	1.0
		Iron, Soluble	61.3		UG/L	6.2	1.0
		Mercury, Soluble	0.10	u	UG/L	0.10	1.0
		Potassium, Soluble	5230		UG/L	498	1.0
		Magnesium, Soluble	14400		UG/L	38.1	1.0
		Manganese, Soluble	2.8		UG/L	1.3	1.0
		Sodium, Soluble	14000		UG/L	43.5	1.0
		Nickel, Soluble	103		UG/L	10.5	1.0
		Lead, Soluble	22.7	u	UG/L	22.7	1.0
		Antimony, Soluble	30.0	u	UG/L	30.0	1.0
		Selenium, Soluble	42.6	u	UG/L	42.6	1.0
		Thallium, Soluble	41.4		UG/L	34.6	1.0
		Vanadium, Soluble	6.8		UG/L	4.6	1.0
		Zinc, Soluble	8.6		UG/L	1.8	1.0

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SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	BOM7C4	Silver, Total	5.0	u	UG/L	5.0	1.0
		Aluminum, Total	38.2	u	UG/L	38.2	1.0
		Arsenic, Total	30.6	u	UG/L	30.6	1.0
		Barium, Total	48.2		UG/L	2.5	1.0
		Beryllium, Total	0.30	u	UG/L	0.30	1.0
		Calcium, Total	62900		UG/L	17.9	1.0
		Cadmium, Total	3.8	u	UG/L	3.8	1.0
		Cobalt, Total	4.8		UG/L	4.1	1.0
		Chromium, Total	332		UG/L	3.1	1.0
		Copper, Total	8.9		UG/L	4.2	1.0
		Iron, Total	931		UG/L	6.2	1.0
		Mercury, Total	0.10	u	UG/L	0.10	1.0
		Potassium, Total	5200		UG/L	498	1.0
		Magnesium, Total	15000		UG/L	38.1	1.0
		Manganese, Total	12.9		UG/L	1.2	1.0
		Sodium, Total	14400		UG/L	43.5	1.0
		Nickel, Total	120		UG/L	10.5	1.0
		Lead, Total	22.7	u	UG/L	22.7	1.0
		Antimony, Total	30.0	u	UG/L	30.0	1.0
		Selenium, Total	42.6	u	UG/L	42.6	1.0
		Thallium, Total	34.6	u	UG/L	34.6	1.0
		Vanadium, Total	9.6		UG/L	4.6	1.0
		Zinc, Total	14.4		UG/L	1.8	1.0

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INORGANICS DATA SUMMARY REPORT 12/08/97

CLIENT: TNU-HANFORD

RECRA LOT #: 9710L067

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	BOM7D8	Silver, Soluble	5.0	u	UG/L	5.0	1.0
		Aluminum, Soluble	38.2	u	UG/L	38.2	1.0
		Arsenic, Soluble	30.6	u	UG/L	30.6	1.0
		Barium, Soluble	25.0		UG/L	2.5	1.0
		Beryllium, Soluble	0.30	u	UG/L	0.30	1.0
		Calcium, Soluble	61900		UG/L	17.9	1.0
		Cadmium, Soluble	3.8	u	UG/L	3.8	1.0
		Cobalt, Soluble	4.1	u	UG/L	4.1	1.0
		Chromium, Soluble	51.4		UG/L	3.1	1.0
		Copper, Soluble	5.9		UG/L	4.2	1.0
		Iron, Soluble	13.3		UG/L	6.2	1.0
		Mercury, Soluble	0.10	u	UG/L	0.10	1.0
		Potassium, Soluble	2340		UG/L	498	1.0
		Magnesium, Soluble	8610		UG/L	38.1	1.0
		Manganese, Soluble	1.3	u	UG/L	1.3	1.0
		Sodium, Soluble	6170		UG/L	43.5	1.0
		Nickel, Soluble	10.5	u	UG/L	10.5	1.0
		Lead, Soluble	22.7	u	UG/L	22.7	1.0
		Antimony, Soluble	30.0	u	UG/L	30.0	1.0
		Selenium, Soluble	42.6	u	UG/L	42.6	1.0
		Thallium, Soluble	34.6	u	UG/L	34.6	1.0
		Vanadium, Soluble	4.6	u	UG/L	4.6	1.0
		Zinc, Soluble	171		UG/L	1.8	1.0

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/08/97

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RECRA LOT #: 9710L067

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-004	BOM7D9	Silver, Total	5.0	u	UG/L	5.0	1.0
		Aluminum, Total	49.3		UG/L	38.2	1.0
		Arsenic, Total	30.6	u	UG/L	30.6	1.0
		Barium, Total	22.1		UG/L	2.5	1.0
		Beryllium, Total	0.30	u	UG/L	0.30	1.0
		Calcium, Total	55200		UG/L	17.9	1.0
		Cadmium, Total	3.8	u	UG/L	3.8	1.0
		Cobalt, Total	4.1	u	UG/L	4.1	1.0
		Chromium, Total	51.7		UG/L	3.1	1.0
		Copper, Total	4.2	u	UG/L	4.2	1.0
		Iron, Total	105		UG/L	6.2	1.0
		Mercury, Total	0.10	u	UG/L	0.10	1.0
		Potassium, Total	2310		UG/L	498	1.0
		Magnesium, Total	7650		UG/L	38.1	1.0
		Manganese, Total	3.0		UG/L	1.3	1.0
		Sodium, Total	5380		UG/L	43.5	1.0
		Nickel, Total	10.5	u	UG/L	10.5	1.0
		Lead, Total	22.7	u	UG/L	22.7	1.0
		Antimony, Total	30.0	u	UG/L	30.0	1.0
		Selenium, Total	42.6	u	UG/L	42.6	1.0
		Thallium, Total	34.6	u	UG/L	34.6	1.0
		Vanadium, Total	4.6	u	UG/L	4.6	1.0
		Zinc, Total	169		UG/L	1.8	1.0

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

DATE RECEIVED: 10/30/97 RFW LOT # :9710L067

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOM7C3						
SILVER, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
SILVER, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
SILVER, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
SILVER, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
ALUMINUM, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
ALUMINUM, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
ALUMINUM, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
ALUMINUM, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
ARSENIC, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
ARSENIC, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
ARSENIC, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
ARSENIC, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
BARIUM, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
BARIUM, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
BARIUM, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
BARIUM, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
BERYLLIUM, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
BERYLLIUM, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
BERYLLIUM, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
BERYLLIUM, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
CALCIUM, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
CALCIUM, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
CALCIUM, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
CALCIUM, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
CADMIUM, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
CADMIUM, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
CADMIUM, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
CADMIUM, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
COBALT, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
COBALT, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
COBALT, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
COBALT, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
CHROMIUM, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
CHROMIUM, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
CHROMIUM, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97

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

DATE RECEIVED: 10/30/97 RFW LOT # :9710L067

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
COPPER, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
COPPER, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
COPPER, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
COPPER, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
IRON, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
IRON, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
IRON, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
IRON, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
MERCURY, SOLUBLE	001	W	97C0846	10/28/97	11/19/97	11/20/97
MERCURY, SOLUBLE	001 REP	W	97C0846	10/28/97	11/19/97	11/20/97
MERCURY, SOLUBLE	001 MS	W	97C0846	10/28/97	11/19/97	11/20/97
MERCURY, SOLUBLE	001 MSD	W	97C0846	10/28/97	11/19/97	11/20/97
POTASSIUM, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
POTASSIUM, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
POTASSIUM, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
POTASSIUM, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
MAGNESIUM, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
MAGNESIUM, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
MAGNESIUM, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
MAGNESIUM, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
MANGANESE, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
MANGANESE, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
MANGANESE, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
MANGANESE, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
SODIUM, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
SODIUM, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
SODIUM, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
SODIUM, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
NICKEL, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
NICKEL, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
NICKEL, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
NICKEL, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
LEAD, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
LEAD, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
LEAD, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
LEAD, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
ANTIMONY, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97

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

DATE RECEIVED: 10/30/97 RFW LOT # :9710L067

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ANTIMONY, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
ANTIMONY, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
ANTIMONY, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
SELENIUM, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
SELENIUM, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
SELENIUM, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
SELENIUM, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
THALLIUM, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
THALLIUM, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
THALLIUM, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
THALLIUM, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
VANADIUM, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
VANADIUM, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
VANADIUM, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
VANADIUM, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
ZINC, SOLUBLE	001	W	972331	10/28/97	11/26/97	11/27/97
ZINC, SOLUBLE	001 REP	W	972331	10/28/97	11/26/97	11/27/97
ZINC, SOLUBLE	001 MS	W	972331	10/28/97	11/26/97	11/27/97
ZINC, SOLUBLE	001 MSD	W	972331	10/28/97	11/26/97	11/27/97
BOM7C4						
SILVER, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
SILVER, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
SILVER, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
SILVER, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
ALUMINUM, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
ALUMINUM, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
ALUMINUM, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
ALUMINUM, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
ARSENIC, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
ARSENIC, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
ARSENIC, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
ARSENIC, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
BARIUM, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
BARIUM, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
BARIUM, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
BARIUM, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD

DATE RECEIVED: 10/30/97 RFW LOT # :9710L067

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BERYLLIUM, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
BERYLLIUM, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
BERYLLIUM, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
BERYLLIUM, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
CALCIUM, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
CALCIUM, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
CALCIUM, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
CALCIUM, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
CADMIUM, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
CADMIUM, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
CADMIUM, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
CADMIUM, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
COBALT, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
COBALT, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
COBALT, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
COBALT, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
CHROMIUM, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
CHROMIUM, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
CHROMIUM, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
CHROMIUM, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
COPPER, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
COPPER, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
COPPER, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
COPPER, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
IRON, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
IRON, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
IRON, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
IRON, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
MERCURY, TOTAL	002	W	97C0846	10/28/97	11/19/97	11/20/97
MERCURY, TOTAL	002 REP	W	97C0846	10/28/97	11/19/97	11/20/97
MERCURY, TOTAL	002 MS	W	97C0846	10/28/97	11/19/97	11/20/97
MERCURY, TOTAL	002 MSD	W	97C0846	10/28/97	11/19/97	11/20/97
POTASSIUM, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
POTASSIUM, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
POTASSIUM, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
POTASSIUM, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
MAGNESIUM, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
MAGNESIUM, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97

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

DATE RECEIVED: 10/30/97 RFW LOT # :9710L067

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MAGNESIUM, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
MAGNESIUM, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
MANGANESE, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
MANGANESE, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
MANGANESE, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
MANGANESE, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
SODIUM, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
SODIUM, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
SODIUM, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
SODIUM, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
NICKEL, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
NICKEL, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
NICKEL, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
NICKEL, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
LEAD, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
LEAD, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
LEAD, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
LEAD, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
ANTIMONY, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
ANTIMONY, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
ANTIMONY, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
ANTIMONY, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
SELENIUM, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
SELENIUM, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
SELENIUM, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
SELENIUM, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
THALLIUM, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
THALLIUM, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
THALLIUM, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
THALLIUM, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
VANADIUM, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
VANADIUM, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
VANADIUM, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
VANADIUM, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97
ZINC, TOTAL	002	W	97L2331	10/28/97	11/26/97	11/27/97
ZINC, TOTAL	002 REP	W	97L2331	10/28/97	11/26/97	11/27/97
ZINC, TOTAL	002 MS	W	97L2331	10/28/97	11/26/97	11/27/97
ZINC, TOTAL	002 MSD	W	97L2331	10/28/97	11/26/97	11/27/97

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INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD

DATE RECEIVED: 10/30/97 RFW LOT # :9710L067

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOM7D8						
SILVER, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
ALUMINUM, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
ARSENIC, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
BARIUM, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
BERYLLIUM, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
CALCIUM, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
CADMIUM, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
COBALT, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
CHROMIUM, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
COPPER, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
IRON, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
MERCURY, SOLUBLE	003	W	97C0846	10/28/97	11/19/97	11/20/97
POTASSIUM, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
MAGNESIUM, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
MANGANESE, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
SODIUM, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
NICKEL, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
LEAD, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
ANTIMONY, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
SELENIUM, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
THALLIUM, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
VANADIUM, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
ZINC, SOLUBLE	003	W	972331	10/28/97	11/26/97	11/27/97
BOM7D9						
SILVER, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
ALUMINUM, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
ARSENIC, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
BARIUM, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
BERYLLIUM, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
CALCIUM, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
CADMIUM, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
COBALT, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
CHROMIUM, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97

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

DATE RECEIVED: 10/30/97 RFW LOT # :9710L067

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
COPPER, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
IRON, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
MERCURY, TOTAL	004	W	97C0846	10/28/97	11/19/97	11/20/97
POTASSIUM, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
MAGNESIUM, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
MANGANESE, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
SODIUM, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
NICKEL, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
LEAD, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
ANTIMONY, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
SELENIUM, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
THALLIUM, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
VANADIUM, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97
ZINC, TOTAL	004	W	97L2331	10/28/97	11/26/97	11/27/97

LAB QC:

MERCURY LABORATORY	LC1 BS	W	97C0846	N/A	11/19/97	11/20/97
MERCURY, TOTAL	MB1	W	97C0846	N/A	11/19/97	11/20/97
MERCURY, TCLP LEACHA	MB2	W	97C0846	N/A	11/19/97	11/20/97
SILVER LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
SILVER, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
ALUMINUM LABORTORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
ALUMINUM, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
ARSENIC LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
ARSENIC, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
BARIUM LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
BARIUM, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
BERYLLIUM LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
BERYLLIUM, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
CALCIUM LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
CALCIUM, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
CADMIUM LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
CADMIUM, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
COBALT LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
COBALT, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
CHROMIUM LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
CHROMIUM, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97

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

DATE RECEIVED: 10/30/97 RFW LOT # :9710L067

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
COPPER LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
COPPER, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
IRON LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
IRON, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
POTASSIUM LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
POTASSIUM, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
MAGNESIUM LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
MAGNESIUM, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
MANGANESE LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
MANGANESE, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
SODIUM LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
SODIUM, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
NICKEL LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
NICKEL, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
LEAD LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
LEAD, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
ANTIMONY LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
ANTIMONY, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
SELENIUM LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
SELENIUM, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
THALLIUM LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
THALLIUM, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
VANADIUM LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
VANADIUM, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97
ZINC LABORATORY	LC1 BS	W	97L2331	N/A	11/26/97	11/27/97
ZINC, TOTAL	MB1	W	97L2331	N/A	11/26/97	11/27/97

RECRA LabNet Use Only
9710L067

Custody Transfer Record/Lab Work Request

RECRA LabNet

Client: ~~Theorem Nuclear~~ TNU-HANFORD
Est. Final Proj. Sampling Date: MM 10/30/97
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: K.C.
QC: STD Del: STD TAT: 30 DAY
Date Rec'd: 10-30-97 Date Due: 11-29-97
Account #: TNUHANFORD

Refrigerator #											4	4		4	4	4			
#/Type Container	Liquid										1pt	1pt		1pt	1qt	1pt			
	Solid																		
Volume	Liquid										500	500		500	500	500			
	Solid																		
Preservatives											HNO3			—	HNO3	—			
ANALYSES REQUESTED →		ORGANIC									INORG								
		VOA	BNA	Pest/PCB	Herb						ICP Metal	CN		Hex Chrome	Mercury	IC Anions			
		RECRA LabNet Use Only																	
											mHSCOM	mHSCOM		ICAL6		LGB			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected														
S - Soil	001	BOM7C3	X	X	W	10-28-97	1046						✓	X		X					
SE - Sediment	002	BOM7C4	X	X			⊥							X				X			
SO - Solid	003	BOM7D8					0935						✓	X							
SL - Sludge	004	BOM7D9			⊥	⊥	⊥							X				X			
W - Water																					
O - Oil																					
A - Air																					
DS - Drum Solids																					
DL - Drum Liquids																					
L - EP/TCLP Leachate																					
WI - Wipe																					
X - Other																					
F - Fish																					

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
RSA-CLIENT INRO
RMSC-Comp
SOG-H0114

Temp. 4.2°

DATE/REVISIONS:
→ 1 INORG = ICCL, ICFL, ICNO3, ICNO2, ICSO4
2
3
4
5
6

Relinquished by	Received by	Date	Time
Dedey	[illegible]	10/30/97	1000

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

RECRA LabNet Use Only

Samples were: ✓
1) Shipped ___ or Hand Delivered ___
Airbill # 801396628970
2) Ambient or Chilled (Y) or N
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times Y or (N)
MM 10/30/97

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

Discrepancies Between Samples Lables and COC Record? Y or (N)
NOTES:

926

DEC 1997
RECEIVED
Data
Log In

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Date: 12-04-97
Laboratory Batch: 9710L067

W.O.#: 10985-001-001-9999-00
Collection Dates: 10-28-97

SAMPLE NUMBER	LAB SAMPLE ID
BOM7C3	9710L067-001
BOM7C4	9710L067-002
BOM7D9	9710L067-004

njp/067.cp

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

DEC 2001
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Data
Log In

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD
RFW# : 9710L067
SDG# : H0114

W.O. # : 10985-001-001-9999-00
Date Received: 10-30-97

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 3 water samples.

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

3. Sample holding time as required by the method and/or contract were met with the exception of Chromium VI sample BOM7C3 and Nitrate and Nitrite sample BOM7C3 which were received past hold and sample BOM7D9 for Nitrate and Nitrite which were analyzed past hold.

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

5. The method blanks were within method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries were within the 75-125% control limits. The matrix spike duplicates were within the 20% RPD control limit.

8. The replicate analyses were within the 20% RPD control limit.

Bruce C Griffin unit leader
FOR J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

12 5 97
Date

njp\i10-067

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 15 pages.

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

WET CHEMISTRY METHODS GLOSSARY FOR ANALYSIS OF WATER SAMPLES

	EPA 600	SW846	OTHER
Acidity	__305.1		
__Alkalinity __Bicarbonate __Carbonate	__310.1		
BOD	__405.1		__5210B (b)
Ion Chromatography:			
__Bromide ✓Chloride ✓Fluoride	✓300.0	__9056	
✓Nitrite ✓Nitrate __Phosphate	✓300.0	__9056	
✓Sulfate __Formate __Acetate __Oxalate	✓300.0	__9056	
Chloride	__325.2	__9251	
Chlorine Residual	__330.5 (mod)		
Cyanide Amenable to Chlorination	__335.2	__9010A	
Cyanide (Total)	__335.2	__9010A __9012	__ILM04.0 (e)
Cyanide, Weak Acid Dissociable			__412 (a) __4500CN-I (b)
COD	__410.4 (mod)		__5220 C (b)
Color	__110.2		
Corrosivity (by Coupon)		__1110 (mod)	
Chromium VI		✓7196A	__3500Cr-D (b)
Fluoride	__340.2		
Hardness, Calcium	__215.2		
Hardness, Total	__130.2		
Iodide			__ASTM D19P202 (1)
Surfactant	__425.1		
__Nitrate-Nitrite __Nitrate __Nitrite	__353.2		
Ammonia	__350.3		
Total __Kjeldahl Nitrogen __Organic Nitrogen	__351.4		
Total __Organic __Inorganic Carbon	__415.1	__9060	
Oil and Grease	__413.1	__9070	
__pH __pH, Paper	__150.1	__9040A __9041A	
Petroleum Hydrocarbons, Total Recoverable	__418.1		
Phenol	__420.1 __420.2	__9065 __9066	
__Ortho Phosphate __Total Phosphate	__365.2		__4500-P B __C
Salinity			__210A (a) __2520B (b)
Settleable Solids	__160.5		
Sulfide	__376.2 __376.1	__9030A	
Reactive __Cyanide __Sulfide		__Sec 7.3	
Silica	__370.1		
Sulfite	__377.1		
Sulfate	__375.4	__9038	
Specific Conductance	__120.1	__9050	
Specific Gravity			__213E (a)
__TCLP __TCLV		__1311	
Synthetic Precipitation Leach		__1312	
Total __Dissolved __Suspended __Solids	160__.1__.2__.3		
Total Organic Halides	__450.1	__9020B	
Turbidity	__180.1		
Volatile Solids __Total __Dissolved __Suspended	__160.4		

Other:_____ Method:_____

RFW 21-21-034/A-08/95

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., (1989).

b. Standard Methods for the Examination of Water and Waste, 17 ed., (1983)

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.

RFW 21-21L-034/D-06/96

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/03/97

CLIENT: TNU-HANFORD

RECRA LOT #: 9710L067

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BOM7C3	Chromium VI	0.020u	MG/L	0.020	1.0
-002	BOM7C4	Chloride by IC	56.0	MG/L	5.0	20.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	1.2 u	MG/L	1.2	5.0
		Nitrate by IC	13	MG/L	1.2	5.0
		Sulfate by IC	54.2	MG/L	5.0	20.0
-004	BOM7D9	Chloride by IC	6.7	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	49	MG/L	2.5	10
		Sulfate by IC	53.4	MG/L	2.5	10.0

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

DATE RECEIVED: 10/30/97 RFW LOT # :9710L067

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOM7C3						
CHROMIUM VI	001	W	97LV1043	10/28/97	11/05/97	11/05/97
CHROMIUM VI	001 REP	W	97LV1043	10/28/97	11/05/97	11/05/97
CHROMIUM VI	001 MS	W	97LV1043	10/28/97	11/05/97	11/05/97
BOM7C4						
CHLORIDE BY IC	002	W	97LCC097	10/28/97	11/15/97	11/15/97
CHLORIDE BY IC	002 REP	W	97LCC097	10/28/97	11/15/97	11/15/97
CHLORIDE BY IC	002 MS	W	97LCC097	10/28/97	11/15/97	11/15/97
CHLORIDE BY IC	002 MSD	W	97LCC097	10/28/97	11/15/97	11/15/97
FLUORIDE BY IC	002	W	97LFC097	10/28/97	11/15/97	11/15/97
FLUORIDE BY IC	002 REP	W	97LFC097	10/28/97	11/15/97	11/15/97
FLUORIDE BY IC	002 MS	W	97LFC097	10/28/97	11/15/97	11/15/97
FLUORIDE BY IC	002 MSD	W	97LFC097	10/28/97	11/15/97	11/15/97
NITRITE BY IC	002	W	97L2C097	10/28/97	11/15/97	11/15/97
NITRITE BY IC	002 REP	W	97L2C097	10/28/97	11/15/97	11/15/97
NITRITE BY IC	002 MS	W	97L2C097	10/28/97	11/15/97	11/15/97
NITRITE BY IC	002 MSD	W	97L2C097	10/28/97	11/15/97	11/15/97
NITRATE BY IC	002	W	97L3C097	10/28/97	11/15/97	11/15/97
NITRATE BY IC	002 REP	W	97L3C097	10/28/97	11/15/97	11/15/97
NITRATE BY IC	002 MS	W	97L3C097	10/28/97	11/15/97	11/15/97
NITRATE BY IC	002 MSD	W	97L3C097	10/28/97	11/15/97	11/15/97
SULFATE BY IC	002	W	97LSC097	10/28/97	11/15/97	11/15/97
SULFATE BY IC	002 REP	W	97LSC097	10/28/97	11/15/97	11/15/97
SULFATE BY IC	002 MS	W	97LSC097	10/28/97	11/15/97	11/15/97
SULFATE BY IC	002 MSD	W	97LSC097	10/28/97	11/15/97	11/15/97
BOM7D9						
CHLORIDE BY IC	004	W	97LCC097	10/28/97	11/15/97	11/15/97
FLUORIDE BY IC	004	W	97LFC097	10/28/97	11/15/97	11/15/97
NITRITE BY IC	004	W	97L2C097	10/28/97	11/15/97	11/15/97
NITRATE BY IC	004	W	97L3C097	10/28/97	11/15/97	11/15/97
SULFATE BY IC	004	W	97LSC097	10/28/97	11/15/97	11/15/97

LAB QC:

CHROMIUM VI	MB1	W	97LV1043	N/A	11/05/97	11/05/97

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

DATE RECEIVED: 10/30/97 RFW LOT # :9710L067

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	MB1 BS	W	97LV1043	N/A	11/05/97	11/05/97
CHROMIUM VI	MB1 BSD	W	97LV1043	N/A	11/05/97	11/05/97
CHLORIDE BY IC	MB1	W	97LCC097	N/A	11/15/97	11/15/97
CHLORIDE BY IC	MB1 BS	W	97LCC097	N/A	11/15/97	11/15/97
FLUORIDE BY IC	MB1	W	97LFC097	N/A	11/15/97	11/15/97
FLUORIDE BY IC	MB1 BS	W	97LFC097	N/A	11/15/97	11/15/97
NITRITE BY IC	MB1	W	97L2C097	N/A	11/15/97	11/15/97
NITRITE BY IC	MB1 BS	W	97L2C097	N/A	11/15/97	11/15/97
NITRATE BY IC	MB1	W	97L3C097	N/A	11/15/97	11/15/97
NITRATE BY IC	MB1 BS	W	97L3C097	N/A	11/15/97	11/15/97
SULFATE BY IC	MB1	W	97LSC097	N/A	11/15/97	11/15/97
SULFATE BY IC	MB1 BS	W	97LSC097	N/A	11/15/97	11/15/97

RECRA LabNet Use Only
9710L067

Custody Transfer Record/Lab Work Request

RECRA LabNet

Client: ~~Thermo Nutech~~ TNU-HANFORD
Est. Final Proj. Sampling Date: 10/28/97
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: K.C.
QC: STD Del: STD TAT: 30 DAY
Date Rec'd: 10-30-97 Date Due: 11-29-97
Account #: TNUHANFORD

Refrigerator #											4	4		4	4	4			
#/Type Container	Liquid										1pt			1pt	1pg	1pt			
	Solid																		
Volume	Liquid										500			500	500	500			
	Solid																		
Preservatives											HNO3			—	HNO3	—			
ANALYSES REQUESTED →		ORGANIC									INORG								
		VOA	BNA	Pest/PCB	Herb						ICP Metal	CN		Hex Chrome	Mercury	IC Anions			
RECRA LabNet Use Only																			
											~~ICP/MS~~	ICP/MS		ICP/6	ICP/MS	SEE BELOW			

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected
S - Soil	001	BOM7C3	X	X	W	10.28.97	1046
SE - Sediment	002	BOM7C4	X	X	↓	↓	↓
SO - Solid	003	BOM7D8			↓	↓	0935
SL - Sludge	004	BOM7D9			↓	↓	↓
W - Water							
O - Oil							
A - Air							
DS - Drum Solids							
DL - Drum Liquids							
L - EP/TCLP Leachate							
WI - Wipe							
X - Other							
F - Fish							

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
RSA-CLIENT INRO
RMSC-Comp
SOG-H011Y

Cooler Temp. 4.2°

DATE/REVISIONS:
→ 1. INORG = ICCL, ICFL, ICNO3, ICNO2, ICSO4
2.
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # 8013966 28870
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

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

Relinquished by	Received by	Date	Time
Jeder	[illegible]	10/30/97	1000

Relinquished by	Received by	Date	Time

ORIGINAL REWRITTEN

PAGE 1 Thermo NUtech CHAIN OF CUSTODY ORD # N7-10-102

RCVD: 10/29/97 DUE: 12/10/97 10/29/97 14:16:03 KEEP: 12/10/98 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY		
01A-W	B0M7C3 (F)	RECRA	WB028	WB073	WB115
01B-W	B0M7C3 MS	RECRA	WB073		
01C-W	B0M7C3 DUP	RECRA	WB073		
02A-W	B0M7C4	RECRA	WB028	WB115	WB461
02B-W	B0M7C4 MS	RECRA	WB028	WB115	WB461
02C-W	B0M7C4 DUP	RECRA	WB028	WB115	WB461
03A-W	B0M7D8 (F)	RECRA	WB028		
04A-W	B0M7D9	RECRA	WB028	WB461	

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
[illegible] Jeckes	10/29/97	RECRA LABNET	10/29/97	Jedey	
				[illegible]	10/30/97 1000

x2

fic Northwest National Labora

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

[redacted] Page 1 of 1

Collector: D.R. BREWINGTON (RFS)	Company Contact: JH KESSNER	Telephone No.: (509) 372-9538	Project Coordinator: FORD, BH
Project Designation: 100-KR41AM(2) GW SAMPLING, FY98	Sampling Location: HANFORD SITE		SAF No.: C98-009
Ice Chest No.: SML399	Field Logbook No.: WM. SMK. 45		Method of Shipment: GOVT. VEHICLE
Shipped To: TMA/WESTON	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS: NA

Special Handling and/or Storage: 4C

SAMPLE ANALYSIS: SDG H0114

Preservation	None	None	HNO3 to pH < 2	Cool 4C	HNO3 to pH < 2	None	HNO3 to pH < 2	HNO3 to pH < 2	HNO3 to pH < 2
Type of Container	G/P	P	G	G/P	G/P	P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	2	2
Volume	20ml	~~250ml~~ 500ml 10/28/97	500ml	500ml	500ml	500ml	1000ml	1000ml	1000ml
	Activity Scan	Tritium - H3	Mercury - 7470 - (CV)	See item (1) in Special Instructions.	ICP Metals - 6010A (TAL)	Chromium Hex - 7196	Gamma Spectroscopy(Water)	Gross Alpha	Gross Beta
			(F/U)	(	(F/U)	(F)			

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	Tritium - H3	Mercury - 7470 - (CV)	See item (1) in Special Instructions.	ICP Metals - 6010A (TAL)	Chromium Hex - 7196	Gamma Spectroscopy(Water)	Gross Alpha	Gross Beta
B0M7C3 (F)	Water	10-28-97	1046			X		X	X			
B0M7C4	Water	10-28-97	1046	X	X	X	X	X		X	X	X

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: D.R. BREWINGTON (RFS)	Date/Time: 10/28/97 1158	Received By: R.E. Steffler	Date/Time: 10-28-97 1158
Relinquished By: R.E. Steffler	Date/Time:	Received By: C. SANGALANG	Date/Time: 10-29-97 1115
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

TOTAL ACTIVITY EXEMPTION APPLIES

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate)

Fax copies of log-in

Matrix *

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

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

fic Northwest National Labora

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C98-009-18

Collector D.R. BREWINGTON (RFS)	**Company Contact** JH KESSNER	**Telephone No.** (509) 372-9538	**Project Coordinator** FORD, BH
Project Designation 100-KR4IAM(2) GW SAMPLING, FY98	**Sampling Location** HANFORD SITE		**SAF No.** C98-009
Ice Chest No. SML 399	**Field Logbook No.** LM. SML. 45		**Method of Shipment** GOVT. VEHICLE
Shipped To TMA/WESTON	**Offsite Property No.** NA		**Bill of Lading/Air Bill No.** NA

Data Turnaround 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS NA

Special Handling and/or Storage 4°C

Preservation	None	None	Cool 4C	HNO3 to pH <	HNO3 to pH <	HNO3 to pH <	HNO3 to pH <			
Type of Container	G/P	P	G/P	G/P	G/P	G/P	G/P			
No. of Container(s)	1	1	1	1	1	2	2			
Volume	20ml	~~250ml~~ 500ml	500ml	500ml	1000ml	1000ml	1000ml			
SAMPLE ANALYSIS SDG H0114	Activity Scan	Tritium - H3	See item (1) in Special Instructions.	ICP Metals - 6010A (TAL) (F/U)	Gamma Spectroscopy(Water)	Gross Alpha	Gross Beta			

Sample No.	Matrix *	Sample Date	Sample Time										
B0M7D8 (F)	Water	10.28.97	0935				X						
B0M7D9	Water	10.28.97	0935	X	X	X	X	X	X	X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By D.R. BREWINGTON (RFS)	Date/Time 1158 10/28/97	Received By R.J. Stoffler R.J. Stoffler	Date/Time 10-28-97 1158
Relinquished By R.J. Stoffler	Date/Time	Received By O. SANDERLING	Date/Time 10-29-97 1115
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
TOTAL ACTIVITY EXEMPTION APPLIES

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate)

Fax copies of log-in

Matrix *

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

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

Case Narrative

1.0 GENERAL

Thermo Nutech Sample Delivery Group H0114 is comprised of the two liquid samples designated as SAF No. C98-009 delivered under project designation 100-KR4IAM(2) GW SAMPLING, FY98.

The samples were received as stated on the Chain-of-Custody document.

2.0 ANALYSIS NOTES

2.1 Gross Alpha/Gross Beta Analyses
No problems were encountered with the analyses.

2.2 Tritium Analyses
No problems were encountered with the analyses.

2.3 Gamma Scan Analyses
No problems were encountered with the analyses.

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0114

SAMPLE SUMMARY

SDG 7462
Contact N. Joseph Verville

Client Westinghouse Hanford
Contract TRB-SBB-207925
Case no SDG H0114

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0M7C4	HANFORD SITE	LIQUID		N710104-01	C98-009		10/28/97
B0M7D9	HANFORD SITE	LIQUID		N710104-02	C98-009		10/28/97
Method Blank		LIQUID		N710104-04	C98-009		
Lab Control Sample		LIQUID		N710104-03	C98-009		
Duplicate (N710104-01)	HANFORD SITE	LIQUID		N710104-05	C98-009		10/28/97
Duplicate (N710104-02)	HANFORD SITE	LIQUID		N710104-06	C98-009		10/28/97

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 12/17/97

N710104-05

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0114

DUPLICATE

B0M7C4

SDG 7462

Contact N. Joseph Verville

Client/Case no Westinghouse Hanford SDG H0114

Case no TRB-SBB-207925

DUPLICATE	ORIGINAL	
Lab sample id N710104-05	Lab sample id N710104-01	Client sample id B0M7C4
Dept sample id 7462-005	Dept sample id 7462-001	Location/Matrix HANFORD SITE LIQUID
	Received 10/29/97	Collected 10/28/97
		Custody/SAF No C98-009

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 TOT	PROT LIMIT
Gross Alpha	2.1	1.2	1.2	3.0	J	80A	1.5	1.1	1.5	J	33	142	
Gross Beta	6.1	1.6	2.1	4.0		80B	5.2	1.5	2.0		16	66	
Tritium	220	130	200	400	J	H	310	130	200	J	34	106	

QC-DUP#1 27636

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 12/17/97

N710104-06

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0114

DUPLICATE

B0M7D9

SDG 7462

Contact N. Joseph Verville

Client/Case no Westinghouse Hanford SDG H0114

Case no TRB-SBB-207925

DUPLICATE

Lab sample id N710104-06

Dept sample id 7462-006

ORIGINAL

Lab sample id N710104-02

Dept sample id 7462-002

Received 10/29/97

Client sample id B0M7D9

Location/Matrix HANFORD SITE LIQUID

Collected 10/28/97

Custody/SAF No C98-009

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
GAMMA SCAN ANALYTES	U						U					
Potassium 40	U		82		U	GAM	U		78	U	-	
Cobalt 60	U		6.1	25	U	GAM	U		9.3	U	-	
Cesium 137	U		5.4	15	U	GAM	U		5.4	U	-	
Europium 152	U		12	50	U	GAM	U		11	U	-	
Europium 154	U		7.8	50	U	GAM	U		7.7	U	-	
Europium 155	U		16	50	U	GAM	U		16	U	-	
Americium 241	U		16		U	GAM	U		15	U	-	
Uranium 238	U		840		U	GAM	U		790	U	-	

Lab id TMANC

Protocol WHC-HASM-1

Version Ver 1.0

Form DVD-DUP

Version 3.06

Report date 12/17/97

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0114

N710104-01

DATA SHEET

B0M7C4

SDG	7462	Client/Case no	Westinghouse Hanford SDG H0114
Contact	N. Joseph Verville	Case no	TRB-SBB-207925
Lab sample id	N710104-01	Client sample id	B0M7C4
Dept sample id	7462-001	Location/Matrix	HANFORD SITE LIQUID
Received	10/29/97	Collected	10/28/97
		Custody/SAF No	C98-009

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	1.5	1.1	1.5	3.0	J	80A
Gross Beta	12587-47-2	5.2	1.5	2.0	4.0		80B
Tritium	10028-17-8	310	130	200	400	J	H
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		79		U	GAM
Cobalt 60	10198-40-0	U		6.4	25	U	GAM
Cesium 137	10045-97-3	U		6.2	15	U	GAM
Europium 152	14683-23-9	U		11	50	U	GAM
Europium 154	15585-10-1	U		7.9	50	U	GAM
Europium 155	14391-16-3	U		15	50	U	GAM
Americium 241	14596-10-2	U		15		U	GAM
Uranium 238	U-238	U		840		U	GAM

Lab id	TMANC
Protocol	WHC-HASM-1
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	12/17/97

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0114

N710104-02

DATA SHEET

B0M7D9

SDG 7462 Client/Case no Westinghouse Hanford SDG H0114
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N710104-02 Client sample id B0M7D9
Dept sample id 7462-002 Location/Matrix HANFORD SITE LIQUID
Received 10/29/97 Collected 10/28/97
Custody/SAF No C98-009

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.70	0.96	1.3	3.0	U	80A
Gross Beta	12587-47-2	35	2.8	2.6	4.0		80B
Tritium	10028-17-8	7600	290	200	400		H
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		78		U	GAM
Cobalt 60	10198-40-0	U		9.3	25	U	GAM
Cesium 137	10045-97-3	U		5.4	15	U	GAM
Europium 152	14683-23-9	U		11	50	U	GAM
Europium 154	15585-10-1	U		7.7	50	U	GAM
Europium 155	14391-16-3	U		16	50	U	GAM
Americium 241	14596-10-2	U		15		U	GAM
Uranium 238	U-238	U		790		U	GAM

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 12/17/97

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0114

Test 80A	Matrix LIQUID
SDG 7462	
Contact N. Joseph Verville	

METHOD SUMMARY

GROSS ALPHA IN WATER

GAS PROPORTIONAL COUNTING

Client	Westinghouse Hanford
Contract	TRB-SBB-207925
Case no	SDG H0114

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Gross Alpha	2: Sum, Alpha Emitters	RESULT RATIO (%) 2+1	2σ
Preparation batch 2785-062								
B0M7C4	N710104-01	80		7462-001	1.5 J			
B0M7D9	N710104-02	80		7462-002	U			
BLK (QC ID=27635)	N710104-04	80		7462-004	U			
LCS (QC ID=27634)	N710104-03	80		7462-003	ok			
Duplicate (N710104-01)	N710104-05	80		7462-005	ok J			
Nominal values and limits from method				RDLs (pCi/L)	3.0			
						Average		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2785-062	2σ prep error 20.0 %				Reference Lab Notebook #2785 pg. 062											
B0M7C4	N710104-01	80		1.5	0.300			76		100			27	11/19/97	11/24	GRB-113
B0M7D9	N710104-02	80		1.3	0.300			69		100			28	11/19/97	11/25	GRB-110
BLK (QC ID=27635)	N710104-04	80		0.99	0.300			37		100				11/19/97	11/24	GRB-116
LCS (QC ID=27634)	N710104-03	80		1.3	0.300			36		100				11/19/97	11/24	GRB-115
Duplicate (N710104-01) (QC ID=27636)	N710104-05	80		1.2	0.300			78		100			28	11/19/97	11/25	GRB-114
Nominal values and limits from method				3.0	0.300			5-150		100			180			

PROCEDURES	REFERENCE	EPA900.0
	EP-120	Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES ± 2 SD FOR 5 SAMPLES	MDA	1.3	± 0.37
	RESIDUE	57	± 41

Lab id	TMANC
Protocol	WHC-HASM-1
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	12/17/97

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0114

Test 80B Matrix LIQUID	Client Westinghouse Hanford
SDG 7462	Contract TRB-SBB-207925
Contact N. Joseph Verville	Case no SDG H0114

METHOD SUMMARY

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Gross Beta	2: Sum, Beta Emitters	RESULT RATIO (%) 2+1	2σ
Preparation batch 2785-062								
B0M7C4	N710104-01	80		7462-001	5.2			
B0M7D9	N710104-02	80		7462-002	35			
BLK (QC ID=27635)	N710104-04	80		7462-004	U			
LCS (QC ID=27634)	N710104-03	80		7462-003	ok			
Duplicate (N710104-01)	N710104-05	80		7462-005	ok			
Nominal values and limits from method				RDLs (pCi/L)	4.0			
						Average		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/L	ALIQ L	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 2785-062	2σ prep error 15.0 %			Reference Lab	Notebook #2785 pg. 062											
B0M7C4	N710104-01	80		2.0	0.300			76		100			27	11/19/97	11/24	GRB-113
B0M7D9	N710104-02	80		2.6	0.300			59		100			28	11/19/97	11/25	GRB-110
BLK (QC ID=27635)	N710104-04	80		2.3	0.300			37		100				11/19/97	11/24	GRB-116
LCS (QC ID=27634)	N710104-03	80		1.9	0.300			36		100				11/19/97	11/24	GRB-115
Duplicate (N710104-01) (QC ID=27636)	N710104-05	80		2.1	0.300			78		100			28	11/19/97	11/25	GRB-114
Nominal values and limits from method				4.0	0.300			5-150		100			180			

PROCEDURES	REFERENCE	EPA900.0
	EP-120	Gross Alpha and Gross Beta in Environmental Water, rev 2

AVERAGES ± 2 SD FOR 5 SAMPLES				
	MDA	2.2	±	0.55
	RESIDUE	57	±	41

Lab id	TMANC
Protocol	WHC-HASM-1
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	12/17/97

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0114

Test GAM Matrix LIQUID	Client Westinghouse Hanford
SDG 7462	Contract TRB-SBB-207925
Contact N. Joseph Verville	Case no SDG H0114

METHOD SUMMARY

GAMMA EMITTERS

GAMMA SCAN

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60		Cesium 137	
Preparation batch 2785-062								
B0M7C4	N710104-01			7462-001	U		U	
B0M7D9	N710104-02			7462-002	U		U	
BLK (QC ID=27635)	N710104-04			7462-004	U		U	
LCS (QC ID=27634)	N710104-03			7462-003	ok		ok	
Duplicate (N710104-02)	N710104-06			7462-006	-	U	-	U
Nominal values and limits from method				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 2785-062	2σ prep error 15.0 %				Reference Lab		Notebook #2785 pg. 062									
B0M7C4	N710104-01			6.2	0.500					409			21	11/18/97	11/18	01,04,00
B0M7D9	N710104-02			5.4	0.500					435			22	11/18/97	11/19	01,04,00
BLK (QC ID=27635)	N710104-04			15	0.500					434				11/18/97	11/21	01,03,00
LCS (QC ID=27634)	N710104-03				0.500					422				11/18/97	11/20	01,04,00
Duplicate (N710104-02)	N710104-06			5.4	0.500					404			32	11/18/97	11/29	01,04,00
Nominal values and limits from method				15	0.500					400			180			

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

AVERAGES ± 2 SD FOR 4 SAMPLES			
MDA	8.0	±	9.4
YIELD		±	

Lab id	TMANC
Protocol	WHC-HASM-1
Version	Ver 1.0
Form	DVD-CMS
Version	3.06
Report date	12/17/97

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0114

Test H Matrix LIQUID
SDG 7462
Contact N. Joseph Verville

METHOD SUMMARY

TRITIUM IN WATER
LIQUID SCINTILLATION

Client Westinghouse Hanford
Contract TRB-SBB-207925
Case no SDG H0114

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium	
Preparation batch 2785-062						
B0M7C4	N710104-01			7462-001	310	J
B0M7D9	N710104-02			7462-002	7600	
BLK (QC ID=27635)	N710104-04			7462-004	U	
LCS (QC ID=27634)	N710104-03			7462-003	ok	
Duplicate (N710104-01)	N710104-05			7462-005	ok	J
Nominal values and limits from method				RDLs (pCi/L)	400	

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 2785-062	2σ prep error 10.0 %				Reference Lab		Notebook #2785 pg. 062									
B0M7C4	N710104-01			200	0.0100					100			28	11/25/97	11/25	LSC-005
B0M7D9	N710104-02			200	0.0100					100			28	11/25/97	11/25	LSC-005
BLK (QC ID=27635)	N710104-04			200	0.0100					100				11/25/97	11/25	LSC-005
LCS (QC ID=27634)	N710104-03			200	0.0100					100				11/25/97	11/25	LSC-005
Duplicate (N710104-01) (QC ID=27636)	N710104-05			200	0.0100					100			28	11/25/97	11/25	LSC-005
Nominal values and limits from method				400	0.0100					25			180			

PROCEDURES REFERENCE EPA906.0
EP-210 Tritium in Water by Distillation, rev 0

AVERAGES ± 2 SD MDA 200 ± 0
FOR 5 SAMPLES YIELD ____ ± ____

Lab id TMANC
Protocol WHC-HASM-1
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 12/17/97

fic Northwest National Labora	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C98-009-60	Page 1 of 1

Collector D.R. BREWINGTON (RFS)	**Company Contact** JH KESSNER	**Telephone No.** (509) 372-9538	**Project Coordinator** FORD, BH
Data Turnaround 45 Days			
Project Designation 100-KR4IAM(2) GW SAMPLING, FY98	**Sampling Location** HANFORD SITE		**SAF No.** C98-009
Ice Chest No. SML399	**Field Logbook No.** Lm. SMK. 45		**Method of Shipment** GOVT. VEHICLE
Shipped To TMA/WESTON	**Offsite Property No.** NA		**Bill of Lading/Air Bill No.** NA

POSSIBLE SAMPLE HAZARDS/REMARKS NA

Special Handling and/or Storage 4C

SAMPLE ANALYSIS SDG H0114

Preservation	None	None	HNO3 to pH <2	Cool 4C	HNO3 to pH <2	None	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2
Type of Container	G/P	P	G	G/P	G/P	P	G/P	G/P	G/P
No. of Container(s)	1	1	1	1	1	1	1	2	2
Volume	20ml	~~250ml~~ 500ml 10/29/97	500ml	500ml	500ml	500ml	1000ml	1000ml	1000ml
	Activity Scan	Tritium - H3	Mercury - 7470 - (CV) (F/U)	See item (1) in Special Instructions. (	ICP Metals - 6010A (TAL) (F/U)	Chromium Hex - 7196 (F)	Gamma Spectroscopy(Water)	Gross Alpha	Gross Beta

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	Tritium - H3	Mercury - 7470 - (CV)	See item (1) in Special Instructions.	ICP Metals - 6010A (TAL)	Chromium Hex - 7196	Gamma Spectroscopy(Water)	Gross Alpha	Gross Beta
B0M7C3 (F)	Water	10-28-97	1046			X		X	X			
B0M7C4	Water	10-28-97	1046	X	X	X	X	X		X	X	X

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By D.R. BREWINGTON (RFS)	Date/Time 10/28/97 1158	Received By R.P. Stiffler	Date/Time 10-28-97 1158
Relinquished By R.P. Stiffler	Date/Time	Received By C-SANGALANG	Date/Time 10-29-97 1115
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
TOTAL ACTIVITY EXEMPTION APPLIES

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate)

Fax copies of log-in

Matrix *

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

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

fic Northwest National Labora	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C98-009-18	Page 1 of 1

Collector D.R. BREWINGTON (RFS)	**Company Contact** JH KESSNER	**Telephone No.** (509) 372-9538	**Project Coordinator** FORD, BH	**Data Turnaround** 45 Days
Project Designation 100-KR4IAM(2) GW SAMPLING, FY98	**Sampling Location** HANFORD SITE		**SAF No.** C98-009	
Ice Chest No. SML 399	**Field Logbook No.** WM SML 45		**Method of Shipment** GOVT. VEHICLE	
Shipped To TMA/WESTON	**Offsite Property No.** NA		**Bill of Lading/Air Bill No.** NA	

POSSIBLE SAMPLE HAZARDS/REMARKS NA

Special Handling and/or Storage 4°C

SAMPLE ANALYSIS SDG H0114

Preservation	None	None	Cool 4C	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2			
Type of Container	G/P	P	G/P	G/P	G/P	G/P	G/P			
No. of Container(s)	1	1	1	1	1	2	2			
Volume	20ml	~~250ml~~ 500ml	500ml	500ml	1000ml	1000ml	1000ml			
	Activity Scan	Tritium - H3	See item (1) in Special Instructions.	ICP Metals - 6010A (TAL) (F/U)	Gamma Spectroscopy(Water)	Gross Alpha	Gross Beta			

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	Tritium - H3	See item (1) in Special Instructions.	ICP Metals - 6010A (TAL)	Gamma Spectroscopy(Water)	Gross Alpha	Gross Beta			
B0M7D8 (F)	Water	10.28.97	0935				X						
B0M7D9	Water	10.28.97	0935	X	X	X	X	X	X	X			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By D.R. BREWINGTON (RFS)	Date/Time 1158 10/28/97	Received By R.J. Stoffler R.J. Stoffler	Date/Time 10-28-97 1158
Relinquished By R.J. Stoffler	Date/Time	Received By O. SANGRADANG	Date/Time 102997 1115
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS
TOTAL ACTIVITY EXEMPTION APPLIES

(1) IC Anions - 300.0 (Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Sulfate)

Fax copies of log-in

Matrix *

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

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

Overnight Air

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
Waste Management		WS7X-0-0028

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Administrative Services	Environmental Operations	Sample & Mobile Lab

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing Fed Ex 4235995[illegible]3 ☒ Prepaid ☐ Collect

Shipped to TMA / Walton
Company 2030 Wright Ave.
Address
City Richmond State CA Zip Code 94804
Country U.S.A.

Off-site Custodian: Attn. Delivery Swatter

On-site Custodian: Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1	Cooler	Water samples double bagged + on wet ice. Cooler = SMY 116 (399) Weight 84 lbs. Col = C45-005-15, C45-004-19, C45-004-60	

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

☐ Required for Project Work. List Project No. _____

☐ Business Trip

☐ Off-site Assignment

☐ Shipment to Subcontractor. List Subcontract No. _____

☒ Other (Please specify) [illegible]

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
NA	NA	10-25-97

Location of and Contact for Property (Name/Phone No./Bldg./Area)
RZ Steffler / 222 2321 / 2030 Wright / 1100

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
10 25 97	772034 / 03E00	NA

Originated By	Date	Authorized By	Date
RZ Steffler	10 25 97	T A Fraccaro	10-25-97
Property Representative Signature	**Date**	**Property Management Approval**	**Date**
		[illegible]	[illegible]

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date
[illegible]	[illegible]

35

DISTRIBUTION (AFTER FINAL SIGNATURES)

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

BC-6001-579 (01/95)

PRIORITY OVERNIGHT WED

CAD# 8053292 28OCT97

TRK# 4235 7950 5623 Form 0201 Deliver by: 29OCT97

OAK

94804-CA-US WA JEM

Fed ex