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Recra LabNet Philadelphia
Analytical Report
****REVISION****

Client : TNU-HANFORD B99-078
RFW# : 9908L930
SDG# : H0508
SAF# : B99-078

W.O. # : 10985-001-001-9999-00
Date Received: 08-31-99

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INORGANIC CASE NARRATIVE

This report is revised to include matrix quality control analyses for Nitrate Nitrite.

1. This narrative covers the analyses of 8 soil samples.

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

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

4. The cooler temperatures were 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 with the exception of Nitrate Nitrite which may be attributed in sample inhomogeneity.

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

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

1-17-00
Date

njp\i08-930r

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 21 pages.

Recra LabNet Philadelphia

WET CHEMISTRY
METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

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

Other: Nitrate, Nitrite **Method:** EPA 353.2

Other: Ammonia **Method** EPA 350.3

Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate } EPA 300.0

L-WI-034/B-06/99

Recra LabNet Philadelphia
METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

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

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

ABBREVIATIONS

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

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

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

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

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

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

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

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

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

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

f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/13/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9908L930

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0W899	% Solids	96.6		%	0.01	1.0
		Chloride by IC	1.9		MG/KG	1.3	1.0
		Fluoride by IC	2.6	u	MG/KG	2.6	1.0
		Nitrite by IC	1.3	u	MG/KG	1.3	1.0
		Nitrate by IC	23		MG/KG	1.3	1.0
		Cyanide, Total	0.52	u	MG/KG	0.52	1.0
		Phosphate by IC	1.4		MG/KG	1.3	1.0
		Chromium VI	0.41	u	MG/KG	0.41	1.0
		Sulfate by IC	19.8		MG/KG	1.3	1.0
		Nitrate Nitrite	5.2		MG/KG	0.21	1.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	9.1		SOIL PH	0.0	1.0
		Sulfide	1.0	u	MG/KG	1.0	1.0
-002	B0W8B2	% Solids	95.6		%	0.01	1.0
		Chloride by IC	3.6		MG/KG	1.3	1.0
		Fluoride by IC	2.6	u	MG/KG	2.6	1.0
		Nitrite by IC	1.3	u	MG/KG	1.3	1.0
		Nitrate by IC	65		MG/KG	2.6	2.0
		Cyanide, Total	0.52	u	MG/KG	0.52	1.0
		Phosphate by IC	2.1		MG/KG	1.3	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Sulfate by IC	14.8		MG/KG	1.3	1.0
		Nitrate Nitrite	14.6		MG/KG	1.0	5.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	9.2		SOIL PH	0.0	1.0
		Sulfide	1.0	u	MG/KG	1.0	1.0
-003	B0W8B3	% Solids	92.4		%	0.01	1.0
		Chloride by IC	4.2		MG/KG	1.4	1.0
		Fluoride by IC	2.7	u	MG/KG	2.7	1.0
		Nitrite by IC	1.4	u	MG/KG	1.4	1.0
		Nitrate by IC	64		MG/KG	5.4	4.0
		Cyanide, Total	0.54	u	MG/KG	0.54	1.0
		Phosphate by IC	1.4	u	MG/KG	1.4	1.0
		Chromium VI	0.43	u	MG/KG	0.43	1.0
		Sulfate by IC	60.8		MG/KG	5.4	4.0
		Nitrate Nitrite	14.3		MG/KG	1.1	5.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	9.1		SOIL PH	0.0	1.0

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INORGANICS DATA SUMMARY REPORT 12/13/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9908L930

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	B0W8B3	Sulfide	1.1 u	MG/KG	1.1	1.0
-004	B0W894	% Solids	95.0	%	0.01	1.0
		Chloride by IC	1.8	MG/KG	1.3	1.0
		Fluoride by IC	2.6 u	MG/KG	2.6	1.0
		Nitrite by IC	1.3 u	MG/KG	1.3	1.0
		Nitrate by IC	43	MG/KG	1.3	1.0
		Cyanide, Total	0.53 u	MG/KG	0.53	1.0
		Phosphate by IC	4.3	MG/KG	1.3	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Sulfate by IC	81.2	MG/KG	2.6	2.0
		Nitrate Nitrite	10.3	MG/KG	0.21	1.0
		Ammonia, as N	1.3 u	MG/KG	1.3	1.0
		pH	8.8	SOIL PH	0.0	1.0
		Sulfide	1.1 u	MG/KG	1.1	1.0
-005	B0W895	% Solids	94.9	%	0.01	1.0
		Chloride by IC	1.9	MG/KG	1.3	1.0
		Fluoride by IC	2.6 u	MG/KG	2.6	1.0
		Nitrite by IC	1.3 u	MG/KG	1.3	1.0
		Nitrate by IC	47	MG/KG	1.3	1.0
		Cyanide, Total	0.53 u	MG/KG	0.53	1.0
		Phosphate by IC	5.6	MG/KG	1.3	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Sulfate by IC	57.7	MG/KG	2.6	2.0
		Nitrate Nitrite	9.7	MG/KG	0.21	1.0
		Ammonia, as N	1.3 u	MG/KG	1.3	1.0
		pH	8.9	SOIL PH	0.0	1.0
		Sulfide	4.0	MG/KG	1.1	1.0
-006	B0W896	% Solids	94.6	%	0.01	1.0
		Chloride by IC	2.0	MG/KG	1.3	1.0
		Fluoride by IC	2.7	MG/KG	2.6	1.0
		Nitrite by IC	1.3 u	MG/KG	1.3	1.0
		Nitrate by IC	47	MG/KG	1.3	1.0
		Cyanide, Total	0.53 u	MG/KG	0.53	1.0
		Phosphate by IC	4.7	MG/KG	1.3	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Sulfate by IC	108	MG/KG	5.3	4.0
		Nitrate Nitrite	9.7	MG/KG	0.20	1.0

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INORGANICS DATA SUMMARY REPORT 12/13/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9908L930

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	B0W896	Ammonia, as N	1.6		MG/KG	1.3	1.0
		pH	8.1		SOIL PH	0.0	1.0
		Sulfide	1.1	u	MG/KG	1.1	1.0
-007	B0W897	% Solids	95.9		%	0.01	1.0
		Chloride by IC	2.0		MG/KG	1.3	1.0
		Fluoride by IC	2.6	u	MG/KG	2.6	1.0
		Nitrite by IC	1.3	u	MG/KG	1.3	1.0
		Nitrate by IC	48		MG/KG	1.3	1.0
		Cyanide, Total	0.52	u	MG/KG	0.52	1.0
		Phosphate by IC	3.0		MG/KG	1.3	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Sulfate by IC	121		MG/KG	2.6	2.0
		Nitrate Nitrite	8.9		MG/KG	0.21	1.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	9.2		SOIL PH	0.0	1.0
		Sulfide	3.9		MG/KG	1.0	1.0
-008	B0W898	% Solids	96.2		%	0.01	1.0
		Chloride by IC	1.9		MG/KG	1.3	1.0
		Fluoride by IC	2.6	u	MG/KG	2.6	1.0
		Nitrite by IC	1.3	u	MG/KG	1.3	1.0
		Nitrate by IC	31		MG/KG	1.3	1.0
		Cyanide, Total	0.52	u	MG/KG	0.52	1.0
		Phosphate by IC	1.7		MG/KG	1.3	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Sulfate by IC	41.6		MG/KG	1.3	1.0
		Nitrate Nitrite	8.0		MG/KG	0.21	1.0
		Ammonia, as N	1.3	u	MG/KG	1.3	1.0
		pH	9.6		SOIL PH	0.0	1.0
		Sulfide	1.0	u	MG/KG	1.0	1.0

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INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/13/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9908L930

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

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LIC080-MB1	Chloride by IC	1.2	u	MG/KG	1.2	1.0
		Fluoride by IC	2.5	u	MG/KG	2.5	1.0
		Nitrite by IC	1.2	u	MG/KG	1.2	1.0
		Nitrate by IC	1.2	u	MG/KG	1.2	1.0
		Phosphate by IC	1.2	u	MG/KG	1.2	1.0
		Sulfate by IC	1.2	u	MG/KG	1.2	1.0
BLANK1	99LC099-MB1	Cyanide, Total	0.50	u	MG/KG	0.50	1.0
BLANK10	99LVI061-MB1	Chromium VI	0.40	u	MG/KG	0.40	1.0
BLANK10	99LN3B45-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	99LN3058-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	99LAM035-MB1	Ammonia, as N	1.2	u	MG/KG	1.2	1.0
BLANK10	99LSD042-MB1	Sulfide	1.0	u	MG/KG	1.0	1.0
BLANK10	99LC102A-MB1	Cyanide, Total	0.50	u	MG/KG	0.50	1.0

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INORGANICS ACCURACY REPORT 12/13/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9908L930

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0W899	Chloride by IC	28.0	1.9	25.9	100.6	1.0
		Chloride by IC MSD	28.6	1.9	25.9	103.1	1.0
		Fluoride by IC	58.3	0.44	51.8	111.8	1.0
		Fluoride by IC MSD	58.2	0.44	51.8	111.6	1.0
		Nitrite by IC	27	1.3 u	26	104.5	1.0
		Nitrite by IC MSD	27	1.3 u	26	106.2	1.0
		Nitrate by IC	51	23	26	110.2	1.0
		Nitrate by IC MSD	52	23	26	112.0	1.0
		Phosphate by IC	27.7	1.4	25.9	101.7	1.0
		Phosphate by IC MSD	27.8	1.4	25.9	102.0	1.0
		Sulfate by IC	48.4	19.8	25.9	110.5	1.0
		Sulfate by IC MSD	48.4	19.8	25.9	110.5	1.0
		Nitrate Nitrite	106	5.2	103	97.4	20.0
		Ammonia, as N	102	1.3 u	101	101.5	1.0
		Ammonia, as N MSD	105	1.3 u	101	103.8	1.0
-002	B0W8B2	Cyanide, Total	5.0	0.52u	5.2	96.0	1.0
-008	B0W898	Soluble Chromium VI	3.9	0.42u	4.2	98.7	1.0
		Insoluble Chromium VI	1200	0.42u	1180	101.9	100
		Sulfide	377	0.0	397	95.0	1.0
		Sulfide MSD	352	0.0	397	88.6	1.0
BLANK10	99LIC080-MB1	Chloride by IC	24.3	1.2 u	25.0	97.3	1.0
		Fluoride by IC	53.3	2.5 u	50.0	106.6	1.0
		Nitrite by IC	24	1.2 u	25	97.5	1.0
		Nitrate by IC	24	1.2 u	25	97.9	1.0
		Phosphate by IC	25.8	1.2 u	25.0	103.1	1.0
		Sulfate by IC	24.0	1.2 u	25.0	96.2	1.0
BLANK10	99LVI061-MB1	Soluble Chromium VI	4.0	0.40u	4.0	99.0	1.0
		Insoluble Chromium VI	1120	0.40u	1160	96.1	100
BLANK10	99LN3B45-MB1	Nitrate Nitrite	5.1	0.20u	5.0	102.4	1.0
		Nitrate Nitrite MSD	5.2	0.20u	5.0	103.0	1.0
BLANK10	99LN3058-MB1	Nitrate Nitrite	5.0	0.20u	5.0	100	1.0
BLANK10	99LAM035-MB1	Ammonia, as N	52.4	1.2 u	50.0	104.8	1.0
		Ammonia, as N MSD	52.6	1.2 u	50.0	105.2	1.0
BLANK10	99LSD042-MB1	Sulfide	9.4	1.0 u	10.0	94.0	1.0
		Sulfide MSD	9.1	1.0 u	10.0	91.0	1.0

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INORGANICS DUPLICATE SPIKE REPORT 12/13/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9908L930

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
-001	B0W899	Chloride by IC	100.6	103.1	2.4
		Fluoride by IC	111.8	111.6	0.20
		Nitrite by IC	104.5	106.2	1.7
		Nitrate by IC	110.2	112.0	1.6
		Phosphate by IC	101.7	102.0	0.36
		Sulfate by IC	110.5	110.5	0.017
		Ammonia, as N	101.5	103.8	2.2
-008	B0W898	Sulfide	95.0	88.6	6.9
BLANK10	99LN3B45-MB1	Nitrate Nitrite	102.4	103.0	0.58
BLANK10	99LAM035-MB1	Ammonia, as N	104.8	105.2	0.48
BLANK10	99LSD042-MB1	Sulfide	94.0	91.0	3.2

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INORGANICS PRECISION REPORT 12/13/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9908L930

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0W899	Chloride by IC	1.9	2.0	3.7	1.0
		Fluoride by IC	2.6 u	2.6 u	NC	1.0
		Nitrite by IC	1.3 u	1.3 u	NC	1.0
		Nitrate by IC	23	23	0.61	1.0
		Phosphate by IC	1.4	1.3 u	NC	1.0
		Sulfate by IC	19.8	19.6	0.60	1.0
		Nitrate Nitrite	5.2	3.1	51.2	1.0
		Ammonia, as N	1.3 u	1.3 u	NC	1.0
-002REP	B0W8B2	Cyanide, Total	0.52u	0.52u	NC	1.0
-008REP	B0W898	% Solids	96.2	96.5	0.23	1.0
		Chromium VI	0.42u	0.42u	NC	1.0
		pH	9.6	9.6	0.0	1.0
		Sulfide	1.0 u	1.0 u	NC	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 12/13/99

CLIENT: TNU-HANFORD B99-078 RECRA LOT #: 9908L930

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99LC099-LC1	Cyanide, Total LCS	1.9	2.0	MG/KG	93.5
LCS2	99LC099-LC2	Cyanide, Total LCS	9.5	10	MG/KG	94.8
LCS10	99LC102A-LC1	Cyanide, Total LCS	1.9	2.0	MG/KG	93.9
LCS20	99LC102A-LC2	Cyanide, Total LCS	9.1	10	MG/KG	90.6

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

DATE RECEIVED: 08/31/99 RFW LOT # :9908L930

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0W899						
% SOLIDS	001	S	99L%S121	08/27/99	09/02/99	09/03/99
CHLORIDE BY IC	001	S	99LIC080	08/27/99	09/25/99	09/25/99
CHLORIDE BY IC	001 REP	S	99LIC080	08/27/99	09/25/99	09/25/99
CHLORIDE BY IC	001 MS	S	99LIC080	08/27/99	09/25/99	09/25/99
CHLORIDE BY IC	001 MSD	S	99LIC080	08/27/99	09/25/99	09/25/99
FLUORIDE BY IC	001	S	99LIC080	08/27/99	09/25/99	09/25/99
FLUORIDE BY IC	001 REP	S	99LIC080	08/27/99	09/25/99	09/25/99
FLUORIDE BY IC	001 MS	S	99LIC080	08/27/99	09/25/99	09/25/99
FLUORIDE BY IC	001 MSD	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRITE BY IC	001	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRITE BY IC	001 REP	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRITE BY IC	001 MS	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRITE BY IC	001 MSD	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE BY IC	001	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE BY IC	001 REP	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE BY IC	001 MS	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE BY IC	001 MSD	S	99LIC080	08/27/99	09/25/99	09/25/99
TOTAL CYANIDE	001	S	99LC099	08/27/99	09/06/99	09/06/99
PHOSPHATE BY IC	001	S	99LIC080	08/27/99	09/25/99	09/25/99
PHOSPHATE BY IC	001 REP	S	99LIC080	08/27/99	09/25/99	09/25/99
PHOSPHATE BY IC	001 MS	S	99LIC080	08/27/99	09/25/99	09/25/99
PHOSPHATE BY IC	001 MSD	S	99LIC080	08/27/99	09/25/99	09/25/99
CHROMIUM VI	001	S	99LVI061	08/27/99	09/07/99	09/07/99
SULFATE BY IC	001	S	99LIC080	08/27/99	09/25/99	09/25/99
SULFATE BY IC	001 REP	S	99LIC080	08/27/99	09/25/99	09/25/99
SULFATE BY IC	001 MS	S	99LIC080	08/27/99	09/25/99	09/25/99
SULFATE BY IC	001 MSD	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE NITRITE	001	S	99LN3B45	08/27/99	09/16/99	09/17/99
NITRATE NITRITE	001 REP	S	99LN3058	08/27/99	12/07/99	12/07/99
NITRATE NITRITE	001 MS	S	99LN3058	08/27/99	12/07/99	12/07/99
AMMONIA	001	S	99LAM035	08/27/99	09/15/99	09/15/99
AMMONIA	001 REP	S	99LAM035	08/27/99	09/15/99	09/15/99
AMMONIA	001 MS	S	99LAM035	08/27/99	09/15/99	09/15/99
AMMONIA	001 MSD	S	99LAM035	08/27/99	09/15/99	09/15/99
PH	001	S	99LPH099	08/27/99	09/15/99	09/15/99

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

DATE RECEIVED: 08/31/99 RFW LOT # :9908L930

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SULFIDE	001	S	99LSD042	08/27/99	09/02/99	09/02/99
B0W8B2						
% SOLIDS	002	S	99L%S121	08/27/99	09/02/99	09/03/99
CHLORIDE BY IC	002	S	99LIC080	08/27/99	09/25/99	09/25/99
FLUORIDE BY IC	002	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRITE BY IC	002	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE BY IC	002	S	99LIC080	08/27/99	09/25/99	09/25/99
TOTAL CYANIDE	002	S	99LC099	08/27/99	09/06/99	09/06/99
TOTAL CYANIDE	002 REP	S	99LC099	08/27/99	09/06/99	09/06/99
TOTAL CYANIDE	002 MS	S	99LC099	08/27/99	09/06/99	09/06/99
PHOSPHATE BY IC	002	S	99LIC080	08/27/99	09/25/99	09/25/99
CHROMIUM VI	002	S	99LVI061	08/27/99	09/07/99	09/07/99
SULFATE BY IC	002	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE NITRITE	002	S	99LN3B45	08/27/99	09/16/99	09/17/99
AMMONIA	002	S	99LAM035	08/27/99	09/15/99	09/15/99
PH	002	S	99LPH099	08/27/99	09/15/99	09/15/99
SULFIDE	002	S	99LSD042	08/27/99	09/02/99	09/02/99
B0W8B3						
% SOLIDS	003	S	99L%S121	08/27/99	09/02/99	09/03/99
CHLORIDE BY IC	003	S	99LIC080	08/27/99	09/25/99	09/25/99
FLUORIDE BY IC	003	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRITE BY IC	003	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE BY IC	003	S	99LIC080	08/27/99	09/25/99	09/25/99
TOTAL CYANIDE	003	S	99LC102A	08/27/99	09/09/99	09/10/99
PHOSPHATE BY IC	003	S	99LIC080	08/27/99	09/25/99	09/25/99
CHROMIUM VI	003	S	99LVI061	08/27/99	09/07/99	09/07/99
SULFATE BY IC	003	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE NITRITE	003	S	99LN3B45	08/27/99	09/16/99	09/17/99
AMMONIA	003	S	99LAM035	08/27/99	09/15/99	09/15/99
PH	003	S	99LPH099	08/27/99	09/15/99	09/15/99
SULFIDE	003	S	99LSD042	08/27/99	09/02/99	09/02/99
B0W894						
% SOLIDS	004	S	99L%S121	08/27/99	09/02/99	09/03/99

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

DATE RECEIVED: 08/31/99 RFW LOT # :9908L930

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHLORIDE BY IC	004	S	99LIC080	08/27/99	09/25/99	09/25/99
FLUORIDE BY IC	004	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRITE BY IC	004	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE BY IC	004	S	99LIC080	08/27/99	09/25/99	09/25/99
TOTAL CYANIDE	004	S	99LC099	08/27/99	09/06/99	09/06/99
PHOSPHATE BY IC	004	S	99LIC080	08/27/99	09/25/99	09/25/99
CHROMIUM VI	004	S	99LVI061	08/27/99	09/07/99	09/07/99
SULFATE BY IC	004	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE NITRITE	004	S	99LN3B45	08/27/99	09/16/99	09/17/99
AMMONIA	004	S	99LAM035	08/27/99	09/15/99	09/15/99
PH	004	S	99LPH099	08/27/99	09/15/99	09/15/99
SULFIDE	004	S	99LSD042	08/27/99	09/02/99	09/02/99
B0W895						
% SOLIDS	005	S	99L%S121	08/27/99	09/02/99	09/03/99
CHLORIDE BY IC	005	S	99LIC080	08/27/99	09/25/99	09/25/99
FLUORIDE BY IC	005	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRITE BY IC	005	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE BY IC	005	S	99LIC080	08/27/99	09/25/99	09/25/99
TOTAL CYANIDE	005	S	99LC099	08/27/99	09/06/99	09/06/99
PHOSPHATE BY IC	005	S	99LIC080	08/27/99	09/25/99	09/25/99
CHROMIUM VI	005	S	99LVI061	08/27/99	09/07/99	09/07/99
SULFATE BY IC	005	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE NITRITE	005	S	99LN3B45	08/27/99	09/16/99	09/17/99
AMMONIA	005	S	99LAM035	08/27/99	09/15/99	09/15/99
PH	005	S	99LPH099	08/27/99	09/15/99	09/15/99
SULFIDE	005	S	99LSD042	08/27/99	09/02/99	09/02/99
B0W896						
% SOLIDS	006	S	99L%S121	08/27/99	09/02/99	09/03/99
CHLORIDE BY IC	006	S	99LIC080	08/27/99	09/25/99	09/25/99
FLUORIDE BY IC	006	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRITE BY IC	006	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE BY IC	006	S	99LIC080	08/27/99	09/25/99	09/25/99
TOTAL CYANIDE	006	S	99LC099	08/27/99	09/06/99	09/06/99
PHOSPHATE BY IC	006	S	99LIC080	08/27/99	09/25/99	09/25/99

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

DATE RECEIVED: 08/31/99 RFW LOT # :9908L930

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	006	S	99LVI061	08/27/99	09/07/99	09/07/99
SULFATE BY IC	006	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE NITRITE	006	S	99LN3B45	08/27/99	09/16/99	09/17/99
AMMONIA	006	S	99LAM035	08/27/99	09/15/99	09/15/99
PH	006	S	99LPH099	08/27/99	09/15/99	09/15/99
SULFIDE	006	S	99LSD042	08/27/99	09/02/99	09/02/99
B0W897						
% SOLIDS	007	S	99L%S121	08/27/99	09/02/99	09/03/99
CHLORIDE BY IC	007	S	99LIC080	08/27/99	09/25/99	09/25/99
FLUORIDE BY IC	007	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRITE BY IC	007	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE BY IC	007	S	99LIC080	08/27/99	09/25/99	09/25/99
TOTAL CYANIDE	007	S	99LC102A	08/27/99	09/09/99	09/10/99
PHOSPHATE BY IC	007	S	99LIC080	08/27/99	09/25/99	09/25/99
CHROMIUM VI	007	S	99LVI061	08/27/99	09/07/99	09/07/99
SULFATE BY IC	007	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE NITRITE	007	S	99LN3B45	08/27/99	09/16/99	09/17/99
AMMONIA	007	S	99LAM035	08/27/99	09/15/99	09/15/99
PH	007	S	99LPH099	08/27/99	09/15/99	09/15/99
SULFIDE	007	S	99LSD042	08/27/99	09/02/99	09/02/99
B0W898						
% SOLIDS	008	S	99L%S121	08/27/99	09/02/99	09/03/99
% SOLIDS	008 REP	S	99L%S121	08/27/99	09/02/99	09/03/99
CHLORIDE BY IC	008	S	99LIC080	08/27/99	09/25/99	09/25/99
FLUORIDE BY IC	008	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRITE BY IC	008	S	99LIC080	08/27/99	09/25/99	09/25/99
NITRATE BY IC	008	S	99LIC080	08/27/99	09/25/99	09/25/99
TOTAL CYANIDE	008	S	99LC102A	08/27/99	09/09/99	09/10/99
PHOSPHATE BY IC	008	S	99LIC080	08/27/99	09/25/99	09/25/99
CHROMIUM VI	008	S	99LVI061	08/27/99	09/07/99	09/07/99
CHROMIUM VI	008 REP	S	99LVI061	08/27/99	09/07/99	09/07/99
CHROMIUM VI	008 MS	S	99LVI061	08/27/99	09/07/99	09/07/99
CHROMIUM VI	008 MSD	S	99LVI061	08/27/99	09/07/99	09/07/99
SULFATE BY IC	008	S	99LIC080	08/27/99	09/25/99	09/25/99

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

DATE RECEIVED: 08/31/99 RFW LOT # :9908L930

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
NITRATE NITRITE	008	S	99LN3B45	08/27/99	09/16/99	09/17/99
AMMONIA	008	S	99LAM035	08/27/99	09/15/99	09/15/99
PH	008	S	99LPH099	08/27/99	09/15/99	09/15/99
PH	008 REP	S	99LPH099	08/27/99	09/15/99	09/15/99
SULFIDE	008	S	99LSD042	08/27/99	09/02/99	09/02/99
SULFIDE	008 REP	S	99LSD042	08/27/99	09/02/99	09/02/99
SULFIDE	008 MS	S	99LSD042	08/27/99	09/02/99	09/02/99
SULFIDE	008 MSD	S	99LSD042	08/27/99	09/02/99	09/02/99

LAB QC:

CHLORIDE BY IC	MB1	S	99LIC080	N/A	09/25/99	09/25/99
CHLORIDE BY IC	MB1 BS	S	99LIC080	N/A	09/25/99	09/25/99
FLUORIDE BY IC	MB1	S	99LIC080	N/A	09/25/99	09/25/99
FLUORIDE BY IC	MB1 BS	S	99LIC080	N/A	09/25/99	09/25/99
NITRITE BY IC	MB1	S	99LIC080	N/A	09/25/99	09/25/99
NITRITE BY IC	MB1 BS	S	99LIC080	N/A	09/25/99	09/25/99
NITRATE BY IC	MB1	S	99LIC080	N/A	09/25/99	09/25/99
NITRATE BY IC	MB1 BS	S	99LIC080	N/A	09/25/99	09/25/99
TOTAL CYANIDE	LC1 L	S	99LC099	N/A	09/06/99	09/06/99
TOTAL CYANIDE	LC2 L	S	99LC099	N/A	09/06/99	09/06/99
TOTAL CYANIDE	MB1	S	99LC099	N/A	09/06/99	09/06/99
PHOSPHATE BY IC	MB1	S	99LIC080	N/A	09/25/99	09/25/99
PHOSPHATE BY IC	MB1 BS	S	99LIC080	N/A	09/25/99	09/25/99
CHROMIUM VI	MB1	S	99LVI061	N/A	09/07/99	09/07/99
CHROMIUM VI	MB1 BS	S	99LVI061	N/A	09/07/99	09/07/99
CHROMIUM VI	MB1 BSD	S	99LVI061	N/A	09/07/99	09/07/99
SULFATE BY IC	MB1	S	99LIC080	N/A	09/25/99	09/25/99
SULFATE BY IC	MB1 BS	S	99LIC080	N/A	09/25/99	09/25/99
NITRATE NITRITE	MB1	S	99LN3B45	N/A	09/17/99	09/17/99
NITRATE NITRITE	MB1 BS	S	99LN3B45	N/A	09/17/99	09/17/99
NITRATE NITRITE	MB1 BSD	S	99LN3B45	N/A	09/17/99	09/17/99
NITRATE NITRITE	MB1	S	99LN3058	N/A	12/07/99	12/07/99
NITRATE NITRITE	MB1 BS	S	99LN3058	N/A	12/07/99	12/07/99
AMMONIA	MB1	S	99LAM035	N/A	09/15/99	09/15/99
AMMONIA	MB1 BS	S	99LAM035	N/A	09/15/99	09/15/99
AMMONIA	MB1 BSD	S	99LAM035	N/A	09/15/99	09/15/99
SULFIDE	MB1	S	99LSD042	N/A	09/02/99	09/02/99

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

DATE RECEIVED: 08/31/99 RFW LOT # :9908L930

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SULFIDE	MB1 BS	S	99LSD042	N/A	09/02/99	09/02/99
SULFIDE	MB1 BSD	S	99LSD042	N/A	09/02/99	09/02/99
TOTAL CYANIDE	LC1 L	S	99LC102A	N/A	09/09/99	09/10/99
TOTAL CYANIDE	LC2 L	S	99LC102A	N/A	09/09/99	09/10/99
TOTAL CYANIDE	MB1	S	99LC102A	N/A	09/09/99	09/10/99

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RECRA LabNet Use Only
9908L930

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

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

Client: TNU-Hanford B99-078
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: OJ
QC: spec Del: std TAT: 30 day
Date Rec'd: 8/31/99 Date Due: 9/30/99
Account #:

Refrigerator #		1	6	1					6		6	6					
#/Type Container	Liquid																
	Solid	1g	1g	1					1g		1g	1g					
Volume	Liquid																
	Solid	250	500	1					500		250	ltr					
Preservatives																	
ANALYSES REQUESTED →		ORGANIC							INORG								
		VOA	BNA	Pest/PCB	Herb				Metal	CN							

RECRA LabNet Use Only

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0624H OGCSC	0625H ODRO	OPCB	Met①	IPH	Ang①
001	BØW899			S	8/27/99	0910	✓	✓	✓	✓	✓	✓
2	B2					0926						
3	B3					0945						
4	94					0748						
5	95					0750						
6	96					0820						
7	97					0835						
8	98					0854						

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

Met① = As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, V, Zn, HG, ICR6

Special Instructions:
Saf # B99-078
9/2/99 added 1N3N2 to all samples

COMPOSITE WASTE

OGCSC = 1-propanol, ethanol

DATE/REVISIONS:
1. Run matrix QC
Ang①2 = 1CCL, 1CFL, 1CNO2, 1CNO3, 1CPO4,
3. 1CSO4, 1SFD, 1NH3N, 1CNTO, 1N3N2
* 4. 423579528808 - 4.2°C
5. 423579528819 - 4.7°C
6. 423579528820 - 5.8°C

RECRA LabNet Use Only

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

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

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

Relinquished by	Received by	Date	Time
Fed Ex	D. Smith	8-31-99	0930

Relinquished by	Received by	Date	Time
	Original Rewritten		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-078-103	Page 1 of 21

Collector: Bowers/Porter/Nielson	Company Contact: Chris Cearlock	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 200 Area Source characterization - 200-CW-1 OU	Sampling Location: GP-8 >15' bgs		SAF No.: B99-078
Ice Chest No.: SML-579	Field Logbook No.: EL-1511		Method of Shipment: Federal Express
Shipped To: TMA/RECRA 8-27-99	Offsite Property No.: A99 0234		Bill of Lading/Air Bill No.: 4235 7952 8820 8-27-99
			COA: ~~B0W~~ B20CW1 671C

Price Code: 8N

Data Turnaround: 45 Days

020

POSSIBLE SAMPLE HAZARDS/REMARKS

9908L930

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	None	Cool 4C	None	Cool 4C	None
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1	1	1	1	1	1
Volume	60mL	60mL	60mL	120mL	250mL	250mL	500mL	500mL	1000mL	1000mL
SAMPLE ANALYSIS	Isotopic Uranium	Nickel-63	Technetium-99	Tritium - H3	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	pH (Soil) - 9045	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions	See item (2) in Special Instructions	See item (3) in Special Instructions

Sample No.	Matrix *	Sample Date	Sample Time										
002 B0W8B2	Soil	8-27-99	0926					X	X	X	X	X	
003 B0W8B3	Soil	8-27-99	0945					X	X	X	X	X	
~~B0W8B4~~	~~Soil~~												
~~B0W8B5~~	~~Soil~~												
~~B0W8B6~~	~~Soil~~												

8-27-99

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Brent Porter	8/27/99 12:00	Peter IB	8/27/99 13:00
Peter IB	8/30/99 11:00	C Price	8/30/99 11:00
C Price	8/30/99 14:00	FEDEX	8/30/99 14:00
Fed Ex	8.31.99/0930	D. Smith	8.31.99/0930

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR NOT AVAILABLE TO SIGN COC

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

(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

use B0W5L8 to ship

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

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

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-078-102

021

Collector Bowers/Porter/Nielson	**Company Contact** Chris Cearlock	**Telephone No.** 372-9574	**Project Coordinator** TRENT, SJ
Project Designation 200 Area Source characterization - 200-CW-1 OU	**Sampling Location** GP-8 <15' bgs		**SAF No.** B99-078
Ice Chest No. ERC-96-060/047	**Field Logbook No.** EL-1511		**Method of Shipment** Federal Express
Shipped To ~~TMA~~/RECRA ~~AZB~~ 8-27-99	**Offsite Property No.** A990233		**Bill of Lading/Air Bill No.** 4235 7952 8808
			COA B20CW1 671C

Price Code 8N **Data Turnaround** 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None	Cool 4C	None	Cool 4C	None	Cool 4C	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	250mL	500mL	500mL	1000mL	1000mL			
SAMPLE ANALYSIS	Isotopic Uranium	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	pH (Soil) - 9045	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.			

	Sample No.	Matrix *	Sample Date	Sample Time										
004	B0W894	Soil	8-27-99	0748		X	X	X	X	X		B0W5L8		
005	B0W895	Soil	8-27-99	0750		X	X	X	X	X		B0W5L8		
006	B0W896	Soil	8-27-99	0820		X	X	X	X	X		B0W5L8		
007	B0W897	Soil	8-27-99	0835		X	X	X	X	X		B0W5L8		
008	B0W898	Soil	8-27-99	0854		X	X	X	X	X		B0W5L8		

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

Relinquished By	Date/Time	Received By	Date/Time
Brent Porter	8/27/99 1300	Refer IB	8/27/99 1300
REFER IB	8/30/99 11:00	CTRICE/CAnice	8/30/99 11:00
CTRICE/CAnice	8/30/99 1400	FEDEX	8/30/99 14:00
Fed Ex	8.31.99/0930	D. Smith	8.31.99/0930

SPECIAL INSTRUCTIONS

See chain of custody comments on SAF B99-078.

COLLECTOR NOT AVAILABLE TO SIGN COCs.

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

(2) NO2/NO3 - 353.1; IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(3) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Americium-241}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

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